

Final

**ENVIRONMENTAL ASSESSMENT
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**



**U.S. Department of Homeland Security
U.S. Customs and Border Protection
SBInet
Washington, D.C**

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FINDING OF NO SIGNIFICANT IMPACT
Environmental Assessment
for the Proposed SBI^{net} Tucson West Project
Ajo, Tucson, Casa Grande, Nogales, and Sonoita Stations Areas of
Responsibility,
U.S. Border Patrol, Tucson Sector, Arizona

PROJECT HISTORY: The Secure Border Initiative (SBI) is a comprehensive, multi-year plan established by the Department of Homeland Security (DHS) in November 2005 to secure America's borders and reduce illegal immigration. SBI was created to bring clarity of mission, effective coordination of DHS assets, and greater accountability in securing the Nation's borders. The SBI mission is to promote border security strategies that protect against and prevent terrorist attacks and other transnational crimes. Additionally, SBI will coordinate DHS efforts to ensure the legal entry and exit of people and goods moving across our borders, and improve the enforcement of immigration, customs, and agriculture laws at our borders, within the country, and abroad.

SBI^{net} is the component of SBI charged with developing and installing technology and tactical infrastructure (TI) solutions to gain operational control of our Nation's borders. The goal of SBI^{net} is to field the most effective, proven technology, infrastructure, personnel, and response platforms, and integrate them into a single, comprehensive border security system for DHS. United States (U.S.) Customs and Border Protection (CBP) is the agent for SBI^{net}, carrying out the program to better execute this vital mission

CBP would deploy a mix of technology, TI, and personnel based on operational need to gain control of each diverse mile of the U.S. border. Operational control exists when CBP is consistently able to: (1) detect illegal entries in to the U.S.; (2) identify and classify these entries to determine the level of threat involved; (3) efficiently and effectively respond to these entries; and, (4) bring each event to an appropriate law enforcement resolution.

The Environmental Assessment (EA) was prepared in compliance with provisions of the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code [U.S.C.] 4332 *et seq.*), the Council on Environmental Quality's (CEQ) NEPA implementing regulations at 40 Code of Federal Regulations (CFR) Part 1500, and the DHS *Management Directive 5100.1, Environmental Planning Program* (71 *Federal Register* [FR] 16790).

The EA analyzes various aspects of a proposed project that would be carried out under SBI and be implemented as a part of the SBI^{net} program. It addresses the potential direct and indirect effects, beneficial and adverse, of the proposed construction, installation, operation, and maintenance of a system of sensor and communication towers, which include associated access roads, communications components, and a combination of sensor and communication components on towers within the U.S. Border Patrol (USBP) Ajo, Casa Grande, Tucson, Nogales and Sonoita stations' Areas of Responsibility (AOR) in southwest Arizona.

PROJECT LOCATION: The proposed project area generally lies within a corridor south of Tucson, Arizona with towers located east and west of Interstate (I)-19. Several proposed towers also lie to the east of the Cabeza Prieta National Wildlife Refuge and Wilderness Area and a few can be found near the towns of Casa Grande, Sasabe, and Sierra Vista, Arizona and near the City of Tucson. All proposed towers are within the counties of Cochise, Pima, Maricopa, Pinal, and Santa Cruz, Arizona.

PURPOSE AND NEED: The purpose of the proposed project is to employ technological infrastructure capable of providing a more efficient and effective means of assessing all border activities including; rapid detection, accurate characterization of the potential threat, coordinated tracking, and deployment of appropriate resources in the apprehension of ICs. Meeting this purpose would 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.

This SBInet Tucson West project is proposed to meet the stated purpose and need by:

- Installing and upgrading technology and infrastructure components to give USBP agents ability to gain, maintain, and strengthen control of the border within proximity of the international boundary;
- Including improved surveillance technology solutions to enhance border enforcement capabilities;
- Applying surveillance technologies that would refine detection, interception, and apprehension of ICs, smugglers, and terrorists;
- Reducing crime in border communities by detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.

ALTERNATIVES: Two alternatives were considered: No Action Alternative, and Proposed Action Alternative. Other alternatives considered but rejected and not further analyzed in this EA were the use of:

- Unmanned aircraft systems;
- Remote sensing satellites;
- Unattended ground sensor;
- Increased CBP workforce; and
- Increased aerial reconnaissance/operations.

No Action Alternative: The No Action Alternative describes future circumstances if the proposed communications and sensor tower installation does not take place, and can be characterized as the continuation of current practices and procedures. While the No Action Alternative does not satisfy the stated purpose and need, its inclusion in this EA is

required by NEPA regulations as a basis of comparison to the anticipated effects of the Proposed Action.

Proposed Action Alternative: The Proposed Action includes the construction, upgrade, operation, and maintenance of 54 sensor and communication towers and associated access roads, which creates a communications network in support of a Common Operating Picture (COP) among components of CBP and other Federal, state, and local partners outside CBP. Of the proposed 54 towers, 12 are upgrades to existing towers (seven existing USBP towers, one tower located at the new proposed Ajo Station, and four existing commercial towers). Impacts resulting from the construction of the 42 new towers and the retrofit/replacement of the 12 existing towers were fully assessed in the attached EA; however, upgrades to the existing towers are considered to be environmentally benign due to the fact the areas are currently disturbed and no further ground disturbance would occur. One of the 12 towers is actually a replacement tower, which would be located at the new Ajo Station that is currently under construction. This tower would be located within an area, which has already been fully analyzed under a previous EA. The remaining 11 towers would only receive retrofits or upgrades to the current tower communications hardware arrays. Three vehicle mobile surveillance systems per station and Unattended Ground Sensors (UGS) are also proposed under this SBI^{net} project, but are not analyzed as a part of the Proposed Action because their potential impacts are considered to be environmentally benign due to the fact the areas are currently disturbed and no further ground disturbance would occur. They are an integral part of the overall COP border environment and, as such, are briefly discussed herein. Existing USBP vehicles will be retrofitted with technologies to allow USBP agents to acquire/send information via the new surveillance and communication towers. The UGS would be placed in disturbed areas where no vegetation would have to be removed for deployment. The intent of the upgraded vehicles, combined with the towers and UGS is to make USBP enforcement actions more efficient and effective. If this is reached, fewer vehicle trips should be required.

In general, a typical new tower in the Tucson West SBI^{net} tower project would:

- be 80 to 200 feet 6 inches high;
- be up to 100- X 100-foot, including the 50- X 50-foot or 80- X 80-foot tower site and a maintained fire buffer. The fire buffer would be maintained free of vegetation;
- have an equipment shelter with an approximately 8-foot X 12-foot footprint;
- have perimeter fencing;
- not have guy wires; and
- have commercial grid power where available, or a propane-solar hybrid generator system and a 1,000-gallon propane fuel tank.

Three types of tower structures are proposed for this project: self standing towers (SST), rapidly deployed towers (RDT), and a third type of tower design called a Ravens Butte (RB). The RB tower is proposed to be utilized at one tower site (TCA-NGL-109) and is a

small skid-mounted tower which would require helicopter deployment. RDT and RB towers are temporary structures than can be disassembled if necessary.

Access roads would need to be improved or constructed in order to install, operate, and maintain the proposed towers. The new access roads would be constructed to provide a 12-foot wide driving surface with 2-foot shoulders on each side (16 feet total). Additionally, some of the new roads may require cut and fill while others may require a v-ditch on one side of the new road. If cut-and-fill would be required the construction impact could extend as much as 22 feet on either side of new roads (yielding an impact corridor 56 feet wide). Road repair would include minor grading, leveling, and installation of nuisance drainage structures while road improvements would include reconstruction of the existing road, and installation of major drainage structures.

Proposed tower, TCA-SON-062 would be located at the National Park Service (NPS) overlook and would also require that the park overlook restroom be relocated. The restroom would be very near where it currently exists and within a previously disturbed site. No flushing or running water would be required as it would be a composting facility as it is currently.

As part of the Proposed Action, the towers would require bi-monthly maintenance; although some communication towers may require less maintenance visits. This necessitates vehicle travel to each of the proposed tower sites for propane delivery, maintenance, and operations of the towers. For the proposed towers which may be installed by helicopter, they would require maintenance activities via helicopter.

Based on discussions with various resource agencies, *SBI*net has agreed that, if after 12 months any tower in the proposed project is not determined to be functional *SBI*net will remove the tower or towers and remediate any impacts caused by the tower construction, operation, and removal.

ENVIRONMENTAL CONSEQUENCES: Implementation of the Proposed Action would permanently disturb approximately 41 acres for the construction of all towers and roads. Additionally, approximately 73 acres would be temporarily disturbed during construction activities for all proposed towers and access roads. No impacts to prime farmland would occur. The proposed tower sites are located predominately in rangeland, agricultural lands and Federally-owned lands.

The Proposed Action would have adverse impacts on cultural resources at two newly recorded sites; however, the implementation of avoidance methods would ensure that these impacts would be below the threshold of adverse effect. Aesthetic resources would be permanently impacted, and these resources are currently impacted by existing structures, or are in remote areas. One tower site on National Park Service land is at a developed site, which would have minor impacts. All other tower and road impacts would be considered insignificant.

CBP is coordinating with the National Park Service to minimize impacts in association with the National Park Service tower site. In addition, CBP is coordinating with U.S. Fish and Wildlife Services (USFWS) regarding five tower sites that are proposed for the Buenos Aires National Wildlife Refuge (BANWR). Construction of these five sites is contingent upon a USFWS determination that they are appropriate and compatible uses in the BANWR. Although the BANWR sites add value to the operational capabilities of the Proposed Action, the Proposed Action can function without the BANWR sites if USFWS ultimately determines that the towers are not an appropriate and compatible use.

Ten proposed tower sites are within the critical habitat for the Mexican spotted owl and TCA-SON-056 is within critical habitat for the Huachuca water umbel. CBP has determined that the Proposed Action may affect but not likely to adversely affect six species; however, the Proposed Action may affect and is likely to adversely affect the Chiricahua leopard frog (*Lithobates chiricahuensis*), Mexican spotted owl (*Strix occidentalis lucida*), jaguar (*Panthera onca*), lesser long-nosed bat (*Leptonycteris yerbabuenae*), and Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*). Consultation with USFWS is ongoing. No impacts to floodplains from access roads would occur with implementation of the Proposed Action. Additionally, the Proposed Action would have temporary and minor impacts to air, roadways and traffic, and ambient noise levels during construction activities. A total of 37 potential Waters of the U.S. would be impacted as a result of the Proposed Action. Construction and other road improvements within these washes are authorized under a Nationwide Permit 14. Commercial grid power would not be impacted as a result of the Proposed Action although long-term benefits to socioeconomics could occur. Illumination of the night sky and impacts to ambient lighting would be considered insignificant upon the implementation of lighting mitigations.

Additionally, the proposed project would result in overall beneficial impacts within the region through a reduction in illegal activities. IC traffic tramples vegetation and wildlife habitat and disturbs soils and previously unknown cultural resources. The proposed project would reduce IC traffic, thereby reducing erosion and compaction in soils resulting in protection to unstable soils from wind and water erosion. With smaller amounts of IC traffic there would also be a reduction in garbage and abandoned cars throughout the surrounding desert region and fewer impacts to vegetation and wildlife habitat would occur. Also, a decrease in border area crime rates and fewer impacts to previously unknown cultural resources would be expected from the reduction in illegal activities.

No significant adverse effects to the natural or human environment, as defined in 40 CFR Section 1508.27 of the CEQ's Regulations for Implementing NEPA, are expected upon implementation of the Proposed Action.

MITIGATION: Mitigation measures are identified for each resource category that could be potentially affected. Many of these measures have been incorporated as standard

operating procedures by CBP in similar past projects. Conservation measures are identified in the Biological Opinion from USFWS (Consultation #22410-F-2008-0373) and are also identified in the EA in Section 5.

Soils

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. 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. 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. Additionally, erosion control measures and appropriate best management practices (BMP), as required and outlined in the Storm Water Pollution Prevention Plan (SWPPP) and engineering designs, will be implemented before, during, and after construction activities.

Road repair or improvements shall avoid, to the greatest extent practicable, creating wind rows with the soils once grading activities are completed. Excess soils from construction activities will be used on-site to raise and shape proposed tower sites and road surfaces.

Vegetation Resources

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.

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.

CBP will remove invasive plants that appear on the tower sites, along sections of repaired and new road. 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 avoid removal of riparian vegetation within 100 feet of aquatic habitats to provide a buffer area to protect the habitat from sedimentation.

Wildlife Resources

The Migratory Bird Treaty Act (16 U.S.C. 703-712, [1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989]) requires that Federal agencies coordinate with the USFWS if a construction activity would result in the take of a migratory bird. 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 would be obtained prior to construction or clearing activities. Another mitigation measure that would be considered is to schedule all construction activities outside nesting seasons negating the requirement for nesting bird surveys. The proposed sensor and communication towers would 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.

Helicopter deployment would occur at one tower and may potentially occur at two other proposed tower sites. To reduce any possible impacts to wildlife, helicopter use should be limited to daylight hours and hovering should be avoided, to the greatest extent possible.

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.

Protected Species

BMPs have been identified to decrease any potential impacts to Federal and state protected species and can be found in the Biological Opinion and in the EA in Section 5.0 Protected Species. Conservation measures have been identified as part of Section 7 consultation (Consultation #22410-F-2008-0373) and CBP would adhere to those measures identified in the Biological Opinion.

Post Construction – General

For construction and maintenance projects that involve land-disturbing activities (e.g., fences, towers, stations, facilities), CBP will provide a report to the USFWS 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 Endangered Species Act for each specific project to ensure compliance. This report will be part of the project management plan.

During follow-up monitoring, CBP will remove non-native invasive plants found on the site. Removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. All chemical applications on refuges must be in coordination with the refuge manager to ensure accurate reporting. Herbicides can be used according to label directions. The monitoring period will be defined in the site restoration plan. Training to identify non-native invasive plants will be provided for CBP contractor personnel or contractors, as necessary. Lehman lovegrass (*Eragrostis lehmanniana*) and buffelgrass (*Pennisetum ciliare*) are particularly important to control for promoting cactus, including Pima pineapple cactus, and agave re-establishment.

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.

CBP will close roads no longer needed after construction and will restore them to natural surface and topography using appropriate techniques. The Global Positioning System (GPS) coordinates of roads that are thus closed will be recorded and integrated into the USBP GIS database. A record of acreage or miles of roads taken out of use, restored, and revegetated will be maintained and included in Project Reports.

Where improved or new roads may increase use of sensitive areas, CBP will prevent access through gating, physical barriers, etc. in coordination with landowners and/or management agencies.

CBP will close and/or restore unauthorized roads at a ratio of 1:1 (1 mile of road closed and/or restored for every 1 mile of road created or repaired) to help offset the anticipated increase in public use of a) repaired or new roads and b) nearby habitat as a result of the proposed action. Road closures must benefit listed species, be approved by the landowners, be on unauthorized roads receiving use, and be designed properly to prevent access. CBP, USFWS, and the Forest Service will evaluate the potential increase in public use of repaired and new roads through the Forest Service's Travel Management program and BANWR management planning within six months of the date of this project's Biological Opinion. Most Forest Service roads to be repaired are classified as Level 2 roads, which are defined as 4WD roads. CBP will quantify a) the post-construction number of miles of new and repaired roads, b) area of new and repaired roads, and c) area of cut and fill. CBP will prepare a road closure/restoration plan in coordination with landowners and/or land management agencies within six

months of the date of this project's Biological Opinion. CBP will assist the Forest Service in implementing its Travel Management Plan.

- a. For every mile of new or repaired road, CBP will close and/or restore the same length of unauthorized road through gating, physical barriers, discing, revegetating, *etc.* the same length of road.
- b. For every new or improved cut and fill area, CBP will restore the same amount of square footage converted to length of road.

CBP will prepare monitoring and mitigation plans as described in the species-specific conservation BMPs. CBP and USFWS will evaluate effectiveness of monitoring and mitigation methods annually. If monitoring and mitigation methods or implementation are ineffective in reaching desired goals, CBP and USFWS will work together to alter methods or implementation.

Species Specific Conservation Measures

Various site specific conservation measures will be undertaken during separate stages of the overall project implementation and include project planning, project planning/documentation, construction /maintenance, and post construction. Post Construction conservation measures are identified herein, while all conservation measures for other project stages are identified in the Biological Opinion and in Section 5 of the EA.

Chiricahua Leopard Frog - Post Construction

CBP will complete a fencing, monitoring, and mitigation plan within six months of the date of this project's Biological Opinion for review and approval by landowners and/or land management agencies and USFWS. This plan will include methods and a schedule for fencing, bullfrog control, monitoring; the process for repair of fence, tank, and roads; and content and schedule for annual reports. The results of annual monitoring will be reported to USFWS annually in a written report due March 1. CBP will develop an Memorandum of Understanding (MOU) with the landowners and/or land management agencies to implement mitigation. 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. Implementation of this plan will begin once approved by USFWS and the land management agencies. Mitigation will be completed within five years of completion of tower construction. CBP will complete an annual report that summarize the implementation of all of the proposed actions, any incidental take that occurred, monitoring results, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.

CBP will monitor Upper Turner and Summit tanks for sedimentation and erosion for three years following construction.

CBP will monitor Upper Turner Tank for dead and dying frogs that may be killed by Bd or other amphibian diseases for three years following construction and once a year in February.

CBP will remove the fence barrier after all construction on TCA-TUS-040 is completed to maintain connectivity between the Upper Turner Tank and Turner Tank populations.

CBP will control non-native species, especially bullfrogs, at five aquatic sites west of I-19 for three years following construction to help offset the anticipated increase in access to occupied habitat in coordination with USFWS and landowners and/or land management agencies. The primary threat to Chiricahua leopard frogs in this area is predation by introduced American bullfrogs, which have well-established populations at Peña Blanca Lake, Ruby Lake, Arivaca Lake, and several other permanent waters. CBP will focus mitigation efforts from Peña Blanca Lake west to Sycamore Canyon, where non-native control will benefit Chiricahua leopard frog populations. Where consistent with livestock operations, CBP will selectively fence ponds vulnerable to bullfrog invasion to exclude bullfrogs while allowing leopard frogs to leave the ponds. Where needed, a portion of each pond will be fenced to exclude livestock and allow for development of frog habitat. Monitor fenced habitat and take corrective actions if fences are breached and bullfrogs reinvade. CBP will coordinate a meeting with USFWS, landowners, and/or land management agencies within two months of the date of this project's Biological Opinion to determine where fencing and bullfrog control are needed.

CBP will install pipe-rail wildlife-friendly fence and cattle guards to reduce public vehicle and cattle trespass in southwestern and northeastern corners of BANWR where frog habitat is likely to be impacted, as per refuge recommendations. CBP will monitor fence and repair fence if needed in cooperation with BANWR. CBP will complete a fencing plan within four months of the date of this project's Biological Opinion in cooperation with BANWR that includes design plans, installation schedule, monitoring plan, and a repair schedule.

Sonora Tiger Salamander – Post Construction

Site restoration is not anticipated, but if impacts to salamander habitat occur, CBP will work with the landowner and/or land management agency to plan and implement restoration.

CBP will implement other conservation measures for pesticides in and near salamander habitats .

Mexican Spotted Owl – Post Construction

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

landowners and/or land management agencies 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, and schedule and content of annual reports. This plan will be completed in coordination with the landowner and/or land management agencies. CBP will develop an MOU with the landowners and/or land management agencies to implement mitigation. CBP will complete the monitoring and mitigation plan, in coordination with landowners and/or management agencies and USFWS, within six months of the date of this project's Biological Opinion. Implementation of this plan will begin once approved by USFWS and the land management agencies and mitigation will be completed within three years from the date construction is completed and towers are fully operational. CBP will complete an annual report for a minimum of three years that summarizes the implementation of all of the proposed actions, monitoring results, mitigation progress, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.

CBP will monitor affected Mexican spotted owl Protected Activity Center (PAC) annually for three years (field seasons) from the date construction is completed and towers are fully operational. CBP will develop an MOU with the landowners and/or land management agencies to conduct spotted owl monitoring USFWS will provide these PAC locations to CBP. Corrective actions should be developed and implemented in coordination with USFWS and landowner and/or land management agencies, if effects are detected. Corrective actions may include road closures, fencing, gating, and/or site restoration. Monitoring will be conducted by an experienced and Federally permitted spotted owl surveyor.

CBP will provide sufficient funds to close unauthorized roads and restore habitat near affected Mexican spotted owl PACs in conjunction with Forest Service travel management planning. For every road repaired or created within 0.25 mile of a Mexican spotted owl PAC, CBP will close and/or restore the same length of road. CBP will update maps showing where improved or new roads were completed. CBP will complete a road closure/restoration plan. Mitigation will be completed within three years of the completion of construction.

Jaguar - Post Construction

CBP will complete a road closure/restoration plan for review and approval by landowners and/or land management agencies and USFWS that:

- a) identifies and maps new roads where barriers will be placed to prevent public access,
- b) identifies and maps unauthorized roads near potential jaguar movement corridors,
- c) specifies that USFWS will use jaguar monitoring results to assist CBP in determining which unauthorized roads to close,

- d) specifies potential road closure methods,
- e) specifies potential restoration methods for closed roads,
- f) includes a schedule for closure, and
- g) includes a schedule and content of annual reporting.

CBP will complete the road closure/restoration plan, in coordination with landowners and/or management agencies and USFWS, within six months of the date of this project's Biological Opinion. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed within six years of completion of the Tucson West tower project. CBP will complete an annual report until all Conservation BMPs for jaguars are completed. This report will summarize the implementation of the proposed actions; number of miles closed and/or restored, restoration methods, effectiveness of road closures and restoration, camera monitoring results, and work plan for the following year.

CBP will provide \$312,000 to monitor the effects of the proposed tower project on the jaguar. CBP will transfer this funding to the AGFD within six months of the completion of this project's Biological Opinion, if it is determined that AGFD is the appropriate recipient for this purpose; otherwise the funding will be transferred to the USFWS. Funding will be used to monitor jaguar presence and movement along the border, and in additional mountain ranges and corridors within the action area. Funding will be used for camera traps, vehicles, supplies, and personnel. The results of this monitoring will be used to determine which unauthorized roads to close and to guide future project design.

CBP will prevent public access of new roads through gating, physical barriers, fencing, *etc.*, in combination with appropriate signage and in coordination with the landowner and/or land management agencies. CBP will work with the land management agencies to determine the best method to prevent public access on new roads needing barriers. Blocking access will be achieved in a way that does not increase the probability that unauthorized roads will be created nearby.

CBP will close and/or restore unauthorized roads in or near jaguar movement corridors to help offset the increase in improved or new roads at a ratio of 2:1 (two miles of road closed and/or restored for every one mile of road created or repaired). This will require post-construction quantification of (a) the number of miles of roads repaired and created, and (b) the area of new and repaired cut and fill. CBP will work with the land management agencies and USFWS to identify unauthorized roads for closure and determine the method most likely to prevent future access. Some road closures will require disking and seeding (using native species), in addition to placement of barriers. Closures will be achieved in a way that does not increase the probability that unauthorized roads will be created nearby.

Lesser long-nosed Bat - Post Construction

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. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed for a minimum of five years from the date all towers within the project area are fully operational or until negative effects from the proposed action are no longer detected. This annual report will summarize the implementation of all of the proposed actions; roost; and tower monitoring results; bat survey results; telemetry study results; salvage, transplant, and restoration results; corrective actions needed or taken (e.g. gating, signing, fencing); any incidental take that occurred; an analysis of the effectiveness of the Conservation BMPs; and work plan for the following year.

CBP will conduct annual bat surveys at bat roosts within one mile of tower sites for two years from the date towers are fully operational. CBP will compare results with previous years' surveys. If negative effects of the proposed action are documented, CBP will take corrective action (e.g. gating, signing, fencing) and will continue to survey annually until negative effects are no longer detected. Tower TCA-SON-062 is less than a mile from a primary roost (State of Texas Mine) occupied by tens of thousands of 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. Surveys will be conducted throughout the season by a lesser long-nosed bat expert.

CBP will monitor roosts within one mile of tower sites for direct or indirect effects of the action for two years from the date towers are fully operational. CBP will install Hobo data loggers in lesser long-nosed bat roosts most prone to human use to detect changes in temperature, humidity, etc. CBP will take corrective actions in coordination with USFWS and/or the landowners/land management agencies if such effects are detected. This may include road closures, gating, signing, fencing, etc.

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. The Patagonia Mountains is covered with hundreds of abandoned mines that may be used by lesser long-nosed bats. Tracking bats telemetered near towers in the Patagonia Mountains will determine where these bats are foraging and roosting. If negative effects are found in foraging or roosting areas as a result of this proposed action, CBP will take corrective action. This may include road closures, gating, signing, fencing, *etc.*

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. If lesser long-nosed bat mortality is documented at tower or wind turbine sites, CBP will: a) immediately notify USFWS in writing. b) work with USFWS to develop site-specific measures to reduce that mortality, and 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 proposed action into an annual report for a minimum of five years.

Where improved or new roads may increase human use of bat roosts occupied or potentially occupied by lesser long-nosed bats, CBP will prevent access through gating, fencing, other physical barriers, *etc.* This includes the State of Texas mine roost. Patagonia Mountains abandoned mines, and other lesser long-nosed bat roosts. Close coordination with USFWS and landowners and/or land management agencies will be necessary, as the design and season of installation is critical to ensure bat gates benefit lesser long-nosed bats.

CBP will water transplanted agave and columnar cacti if needed and according to site conditions to ensure survival. CBP will monitor annually for survival for five years and will replace dead or dying plants.

CBP will replace agaves and columnar cacti removed for construction at a 2:1 ratio. CBP will work with landowners and/or land management agencies 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.

Pima Pineapple Cactus - Post Construction

CBP will prepare a Pima pineapple cactus monitoring and mitigation plan for review and approval by landowners and/or land management agencies and USFWS that includes a map of Pima pineapple cactus habitat to be monitored, a map of Pima pineapple cactus habitat destroyed or compromised, number of acres of Pima pineapple cactus habitat

destroyed or compromised, pre-construction cactus survey results, method and schedule to monitor the amount of ongoing disturbance from public use and CBP activities, potential corrective actions such as road closures and fencing, amount of habitat to be mitigated, schedule for mitigation banking completion, and content and schedule of annual reports. CBP will complete the plan, in coordination with landowners and/or land management agencies and USFWS, within six months of the date of this project's Biological Opinion. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed within three years from the date all towers within the project area are fully operational. CBP will complete an annual report for a minimum of three years that summarize the implementation of all of the proposed actions, monitoring results, mitigation banking, corrective actions taken, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.

CBP will fund monitoring in suitable cactus habitat within 50 feet of tower sites, repaired roads, and new roads annually for three years. CBP will take corrective action, in coordination with the landowners and/or land management agencies, if Pima pineapple cactus habitat is degraded as a result of the proposed action and increased public use. This includes control of non-native invasive species such as buffelgrass and Lehmann lovegrass.

CBP will compensate for habitat degradation or loss on a 1:1 basis in a conservation bank on private land in Altar Valley within one year of construction of towers.

Cultural Resources

The results of the survey and recommendations are noted in Section 3.10 of this report. A site testing plan for those sites that have unknown eligibility status has been developed through consultation with CBP, the land manager and Arizona State Historical Preservation Officer (SHPO) to ascertain eligibility status for National Register of Historic Places (NRHP). In addition, avoidance assurance measures will be utilized; these have been developed jointly in consultation with CBP, the land manager and Arizona SHPO. Through current design plans and avoidance measures, sites will not be adversely affected by the project. Archaeological monitoring for NRHP-eligible sites adjacent to the access roads and compound areas will be conducted during construction. Archaeologists will delineate all NRHP eligible sites to ensure no adverse effects would occur to those significant resources through the development of an Memorandum of Agreement (MOA) for data recovery, if necessary. Archaeologists will delineate all NRHP-eligible sites to assure no adverse impacts would occur to those significant resources. Archaeologists will also provide in-field awareness training to construction personnel to ensure avoidance. All construction will be restricted to previously surveyed areas. If any cultural material is discovered during construction, Arizona SHPO, and the land manager, as appropriate, will be notified immediately and all activities halted in that area until a qualified archeologist assesses the cultural remains. Additionally, SBI^{net} will complete the Section 106 process prior to the start of any construction activities.

Water Resources

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

A Construction Stormwater General Permit will be obtained prior to construction, and this would 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.

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.

Air Quality

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. 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. Additionally, all construction equipment and vehicles will be required to be maintained in good operating condition to minimize exhaust emissions.

Noise

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 would 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 would 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.

Utilities

Lighting

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 night-time lighting to migratory bird and nocturnal flying species, and astronomical observatories. Any infrared lighting installed on the proposed towers would be compatible with night vision goggle usage. The tower site lighting proposed for CBP security purposes would: 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.

Currently, it not anticipated that night-time construction would occur; however if night-time construction becomes necessary its use would be minimized and the lights would be shielded and follow light ordinances.

Hazardous Materials

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. 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 would 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.

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.

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 on-site receptacles. Solid waste will be collected and disposed of by a local waste disposal contractor.

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.

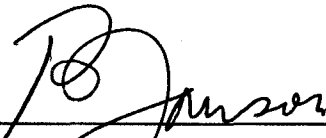
Where handling of hazardous and regulated materials does occur, CBP will collect and store all fuels, waste oils and solvents in clearly labeled tanks or drums within a secondary containment system that consists of an impervious floor and bermed sidewalls capable of containing the volume of the largest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

FINDING: Based upon the analyses of the EA and the mitigation measures to be incorporated as part of the Proposed Action, it has been concluded that the Proposed Action will not result in any significant effects to the environment. Therefore, no further environmental impact analysis is warranted.



Robert W. Gilbert
Chief Patrol Agent
U.S. Border Patrol
Tucson Sector

9/15/08
Date



Robert F. Janson
Acting Executive Director
Facilities Management and Engineering
U.S. Customs and Border Protection

9/17/08
Date

Final

**ENVIRONMENTAL ASSESSMENT
FOR
THE PROPOSED SBInet TUCSON WEST PROJECT
AJO, TUCSON, CASA GRANDE, NOGALES, AND SONOITA STATIONS
AREAS OF RESPONSIBILITY, U. S. BORDER PATROL,
TUCSON SECTOR, ARIZONA**

September 2008

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EXECUTIVE SUMMARY

INTRODUCTION

The Secure Border Initiative (SBI) is a comprehensive, multi-year plan established by the Department of Homeland Security (DHS) in November 2005 to secure America's borders and reduce illegal immigration. The SBI mission is to promote border security strategies that protect against and prevent terrorist attacks and other transnational crimes. Additionally, the SBI initiative will coordinate DHS efforts to ensure the legal entry and exit of people and goods moving across our borders and improve the enforcement of immigration, customs, and agriculture laws at our borders, within the country, and abroad.

SBI_{net} is the component of SBI charged with developing and installing technology and tactical infrastructure (TI) solutions to gain operational control of our Nation's borders. The goal of *SBI_{net}* is to employ the most effective, proven technology, infrastructure, personnel, and response platforms and integrate them into a single comprehensive border security suite for the DHS.

DHS, U.S. Customs and Border Protection (CBP) will deploy a mix of technology, TI, and personnel based on operational need to gain control of each diverse mile of the border. Operational control exists when CBP is consistently able 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; and (4) bring each event to a satisfactory law enforcement resolution.

This Environmental Assessment (EA) addresses proposed project alternatives developed to assist CBP in their mission to control and deter cross-border violators.

PURPOSE AND NEED

The purpose of the proposed project is to improve CBP's efficiency and probability of detection, identification, and apprehension of illegal border crossers. Achieving operational control of the borders of the U.S is a key mission of CBP. The objective of this *SBI_{net}* project would establish and maintain operational control of approximately 81 miles of the U.S. border in the Tucson Sector, within Ajo, Tucson, Casa Grande, Nogales and Sonoita stations' Areas of Responsibility (AOR), which defines the geographic scope of this project.

The proposed project is needed to:

- 1) Install and upgrade technology and infrastructure components to give CBP agents the ability to gain, maintain, and strengthen control of the border within proximity of the international boundary;
- 2) Improve surveillance technology solutions to enhance border enforcement capabilities;

- 3) Apply surveillance technologies that would refine detection, interception, and apprehension of illegal crossers (IC), smugglers, and terrorists; and
- 4) Reduce crime in border communities by detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.

DESCRIPTION OF PROPOSED ACTION

The Proposed Action includes the construction, upgrade, operation, and maintenance of 54 sensor and communication towers and associated access roads, which creates a communications network in support of a Common Operating Picture (COP) among components of CBP and other Federal, state, and local partners outside CBP. Of the proposed 54 towers, 12 are upgrades to existing towers (seven existing CBP towers, one tower located at the new proposed Ajo Station and four existing commercial towers). Impacts resulting from the construction of the 42 new towers and the retrofit/replacement of the 12 existing towers are fully assessed in this EA; however, upgrades to the existing towers are considered to be environmentally benign due to the fact the areas are currently disturbed and no further ground disturbance would occur. One of the 12 towers is actually a replacement tower, which would be located at the new Ajo Station that is currently under construction. This tower would be located within an area, which has already been fully analyzed under a previous EA. The remaining 11 towers would only receive retrofits or upgrades to the current tower communications hardware arrays. Three vehicle mobile surveillance systems per station and Unattended Ground Sensors (UGS) are also proposed under this *SBI*net project, but are not analyzed as a part of the Proposed Action because their potential impacts are benign. They are an integral part of the overall COP border environment and, as such, are briefly discussed herein. The existing CBP vehicles would be retrofitted with technologies to allow CBP agents to acquire/send information via the new surveillance and communication towers. The UGS would be placed in disturbed areas where no vegetation would have to be removed for deployment. The intent of the upgraded vehicles, combined with the towers and UGS is to make CBP enforcement actions more efficient and effective. If this is reached, fewer vehicle trips should be required.

In general, a typical new tower in the Tucson West *SBI*net tower project would:

- be 80 to 200 feet 6 inches high;
- be up to 100- X 100-foot, including the 50- X 50-foot or 80- X 80-foot tower site and a maintained fire buffer. The fire buffer would be maintained free of vegetation;
- have an equipment shelter with an approximately 8-foot X 12-foot footprint;
- have perimeter fencing;
- not have guy wires; and
- have commercial grid power where available, or a propane-solar hybrid generator system and a 1,000 gallon propane fuel tank.

Proposed tower, TCA-SON-062, would be located at the National Park Service (NPS) overlook and would also require that the park overlook restroom be relocated. The restroom would be very near where it currently exists and within a previously disturbed site. No flushing or running water would be required as it would be a composting facility as it is currently.

As part of the Proposed Action, the towers would require bi-monthly maintenance, although some communication towers may require less maintenance visits. This necessitates vehicle travel to each of the proposed tower sites for propane delivery, maintenance, and operations of the towers. For the proposed towers, which may be installed by helicopter, maintenance activities via helicopter would be required.

Based on discussions with various resource agencies, *SBI*net has agreed that 12 months after any tower in the proposed project is not determined to be functional, *SBI*net would remove the tower(s) and remediate any impacts caused by the tower construction, operation, and removal.

PROPOSED ACTION AND ALTERNATIVES CONSIDERED

There are two alternatives analyzed: (1) No Action Alternative, and (2) Proposed Action, which is described above.

Under the No Action Alternative, no towers would be constructed within the Ajo, Casa Grande, Tucson, Nogales and Sonoita stations AORs. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action are evaluated.

ENVIRONMENTAL CONSEQUENCES

Implementation of the Proposed Action would permanently disturb approximately 41 acres for the construction of all towers and roads. Additionally, approximately 73 acres would be temporarily disturbed during construction activities for all proposed towers and access roads. However, no impacts to prime farmland would occur. The proposed tower sites are located predominately in rangeland, agricultural lands and Federally owned lands. The Proposed Action would have adverse impacts on cultural resources at two newly recorded sites; however, the implementation of avoidance methods would assure these impacts would be below the threshold of adverse effect. Aesthetic resources would be permanently impacted, and these resources are currently impacted by existing structures, or are in remote areas. One tower site on NPS land is at a developed site and would have minor to moderate impacts on the area's aesthetic quality. CBP is coordinating with NPS to minimize impacts in association with this tower site. Ten proposed tower sites are within the critical habitat for the Mexican spotted owl and one tower is within critical habitat for the Huachuca water umbel. CBP has determined that the Proposed Action may affect but not likely to adversely affect seven species; however, the Proposed Action may affect and is likely to adversely affect the Mexican spotted owl, Chiricahua leopard frog, jaguar, and Pima pineapple cactus. Consultation with U.S. Fish and Wildlife Services (USFWS) has been completed.

Additionally, the Proposed Action would have temporary and minor impacts to air, roadways and traffic, and ambient noise levels during construction activities. A total of 37 potential Waters of the U.S. would be impacted as a result of the Proposed Action. Construction and other road improvements within these washes are authorized under a Nationwide Permit 14. No impacts to floodplains from access roads would occur with implementation of the Proposed Action. Commercial grid power would not be impacted as a result of the Proposed Action; however, long term benefits to socioeconomics could occur. Illumination of the night sky and impacts to ambient lighting would be considered insignificant upon the implementation of lighting mitigations.

Additionally, the proposed project would result in overall beneficial impacts within the region through a reduction in illegal activities. IC traffic tramples vegetation and wildlife habitat and disturbs soils and previously unknown cultural resources. The proposed project would reduce IC traffic, thereby reducing erosion and compaction in soils resulting in protection to unstable soils from wind and water erosion. With decreased amounts of IC traffic there would be also be a reduction in garbage and abandoned cars throughout the surrounding desert region and less impacts to vegetation and wildlife habitat. Also, a decrease in border area crime rates and fewer impacts to previously unknown cultural resources would be expected from the reduction in illegal activities.

No significant adverse effects to the natural or human environment, as defined in 40 Code of Federal Regulations (CFR) Section 1508.27 of the Council on Environmental Quality's (CEQ) Regulations for Implementing National Environmental Policy Act (NEPA), are expected upon implementation of the Proposed Action.

FINDINGS AND CONCLUSIONS

Based upon the analyses of the EA and the environmental design and mitigation measures to be implemented, the Proposed Action would not have a significant effect on the environment. Therefore, no additional environmental evaluation is warranted.

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SECTION 1.0
BACKGROUND

1.0 BACKGROUND

1.1 INTRODUCTION

This Environmental Assessment (EA) analyzes various aspects of a proposed project that would be carried out under the Secure Border Initiative (SBI) and be implemented as a part of the *SBI_{net}* program. It addresses the potential direct and indirect effects, beneficial and adverse, of the proposed construction, installation, operation, and maintenance of a system of sensor and communication towers, which include access roads, communications components, and a combination of sensor and communication components on towers within the United States (U.S.) of Border Patrol's (USBP) Ajo, Casa Grande, Tucson, Nogales and Sonoita stations' Areas of Responsibility (AOR) in southwest Arizona (Figure 1-1). Because the proposed project would be located in the western portion of the USBP's Tucson Sector, it is known as the *SBI_{net}* Tucson West project.

This EA was prepared in compliance with provisions of the National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code [U.S.C.] 4332 *et seq.*), the Council on Environmental Quality's (CEQ) NEPA implementing regulations at 40 Code of Federal Regulations (CFR) Part 1500, and the U.S. Department of Homeland Security's (DHS) *Management Directive 5100.1, Environmental Planning Program* (71 *Federal Register* [FR] 16790).

Consistent with 40 CFR 1508.28, this EA analyzes direct and indirect site-specific and cumulative environmental impacts of the proposed project. The affected area for this EA covers approximately 30,000 square miles of southern Arizona generally bounded by the cities of Ajo, Phoenix, and Sierra Vista. In connection with earlier border infrastructure projects, much of this area was analyzed in previous NEPA documents prepared by CBP and the legacy Immigration and Naturalization Service (INS).

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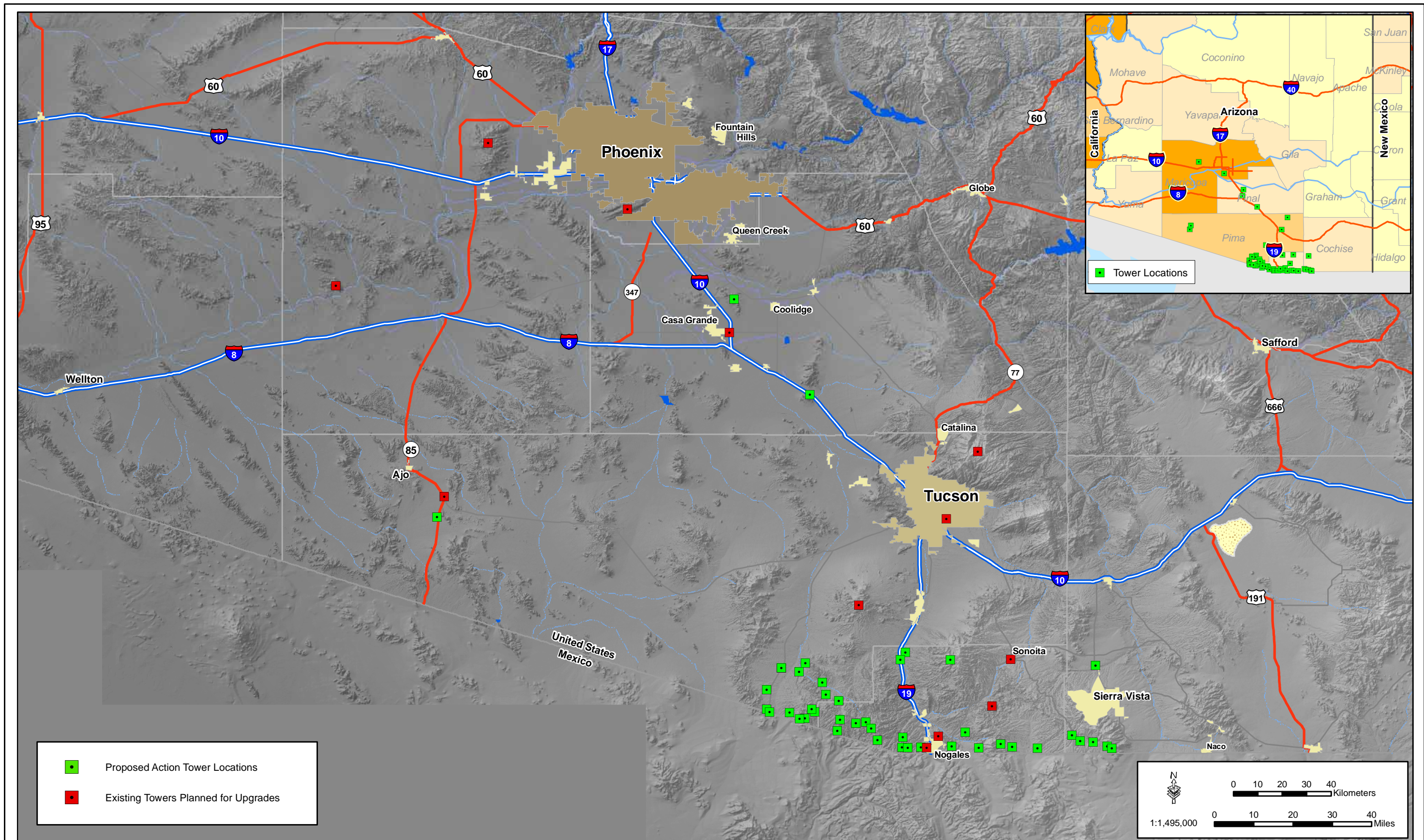


Figure 1-1: Vicinity Map



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Accordingly, this EA tiers from a July 2001 INS and Joint Task Force Six (JTF-6) NEPA document entitled, *Supplemental Programmatic Environmental Impact Statement (PEIS), INS and JTF-6 Activities on the Southwest U.S.-Mexico Border* (INS 2001) and the *Programmatic Environmental Assessment for the Proposed Installation and Operation of Remote Video Surveillance Systems in the Western Region of the Immigration and Naturalization Service* (INS 2003). Where the EA incorporates previously documented information, the appropriate NEPA document is cited and the incorporated content is summarized in this EA, such as from the 2007 CBP document entitled, *Environmental Assessment SBI-net Project 28, Pima County, Arizona* (CBP 2007a). Where previous NEPA documents do not provide sufficient information for the analysis required in this EA, new surveys for sensitive resources and tower site characterization were completed and this information is updated in this EA.

USBP Tucson Sector provides law enforcement support for the Arizona counties of Maricopa, Pima, Santa Cruz, Pinal, and Cochise. There are five USBP stations (Ajo, Casa Grande, Tucson, Nogales and Sonoita), which would be affected by the proposed project. CBP proposes to design, develop, and deploy technology-based solutions to decrease illegal cross-border activities and deter and detect illegal entries in the west corridor of Tucson Sector. This project would support the CBP's mission by strengthening national security between ports of entry (POE) to prevent illegal entry of terrorists, terrorist weapons, contraband, and illegal crossers (ICs) into the U.S.

The SBI-net project described and analyzed in this EA is anticipated to achieve CBP operational requirements and their mission of improving land border security. This EA describes the project goals that SBI-net is required to support and analyzes the potential environmental impacts posed by the siting, construction, upgrade, operation, and deployment of its component structures, facilities, and mobile resources.

1.1.1 Program Background

The U.S. experiences a substantial influx of ICs, illegal drugs, and other contraband across its borders every year. These illegal activities cost U.S. citizens billions of

dollars annually, directly from criminal activities, including the costs of apprehension, detention, and incarceration of criminals, and indirectly by loss of property, illegal participation in government programs, and increased insurance costs.

SBI is a comprehensive, multi-year plan established by DHS in November 2005 to secure America's borders and reduce illegal immigration. SBI was created to bring clarity of mission, effective coordination of DHS assets, and greater accountability in securing the Nation's borders. The SBI mission is to promote border security strategies that protect against and prevent terrorist attacks and other transnational crimes. Additionally, the SBI initiative will coordinate DHS efforts to ensure the legal entry and exit of people and goods moving across our borders, and improve the enforcement of immigration, customs, and agriculture laws at our borders, within the country, and abroad.

SBI_{net} is the component of SBI charged with developing and installing technology and tactical infrastructure (TI) solutions to gain operational control of our Nation's borders. The goal of *SBI_{net}* is to field the most effective, proven technology, infrastructure, personnel, and response platforms, and integrate them into a single, comprehensive border security system for DHS. CBP is the agent for *SBI_{net}*, carrying out the program to better execute this vital mission

CBP would deploy a mix of technology, TI, and personnel based on operational need to gain control of each diverse mile of the U.S. border. Operational control exists when CBP is consistently able to: (1) detect illegal entries in to the U.S.; (2) identify and classify these entries to determine the level of threat involved; (3) efficiently and effectively respond to these entries; and, (4) bring each event to an appropriate law enforcement resolution.

1.1.2 Legislative Background

Among its many functions, DHS is charged with enforcing the Immigration and Naturalization Act (INA), which includes the power and duty to control and guard the

boundaries and borders of the U. S. against the illegal entry of aliens (8 U.S.C. 1103). Pursuant to Section 1502 of the Homeland Security Act, the President's reorganization plan of January 30, 2003, established CBP, which has responsibility for the resources and missions of the legacy Customs Service and INS relating to borders and POEs. CBP's core mission is to defend U.S. borders against all threats while facilitating legitimate trade and travel.

As a component of DHS that is responsible for border security, CBP shares DHS's mandate from Congress to achieve and maintain operational control of the U.S. borders (8 U.S.C. 1701). Pursuant to Section 102 of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA), as amended, Congress has provided DHS with a number of authorities necessary to accomplish this mandate. Section 102(a) provides that the Secretary of Homeland of Security shall take such actions as may be necessary to install additional physical barriers and roads in the vicinity of the U.S. borders to deter illegal crossings in areas of high illegal entry. Under the Secure Fence Act of 2006, Congress called on DHS to install not less than 700 miles of fencing on the southwest border and to provide for the installation of additional physical barriers, roads, lighting, cameras, and sensors to gain operational control of the southwest border. *SBI_{net}* is working to design, develop, and deploy the technology-based solutions that will help DHS meet Congress' mandate to achieve and maintain operational control of the U.S. borders.

1.2 PURPOSE AND NEED

The purpose of the proposed project is to employ technological infrastructure capable of providing a more efficient and effective means of assessing all border activities including; rapid detection, accurate characterization of the potential threat, coordinated tracking, and deployment of appropriate resources in the apprehension of ICs. Meeting this purpose would establish and maintain operational control of the U.S. border along approximately 81 miles of border in the Tucson Sector, encompassing border zones in

and around Tucson, Nogales, and Sonoita stations, as well as portions of Ajo and Casa Grande stations.

The implementation of this proposed project would support CBP's mission and activities of predicting, detecting, identifying, classifying, tracking, and responding to illegal cross-border activities at and between POEs and within the Ajo, Casa Grande, Tucson, Nogales and Sonoita stations' AORs. The project would provide necessary decision support information to assist CBP officers and agents in the resolution of all border incursions.

Due to the frequency and nature of illegal border activities and the vast geographic area over which these activities occur, there is a need for a technology based solution that can collect, resolve, and distribute the information necessary to provide a Common Operating Picture (COP) among enforcement agencies. The COP will provide connectivity with various CBP components, and inter-operability with other Federal, state, and local partners outside of CBP. The *SBI_{net}* system is expected to allow the CBP to spend less time locating and pursuing violators, and more time apprehending and seizing those involved in illegal border activities.

This *SBI_{net}* Tucson West project is proposed to meet the stated purpose and need by:

- 1) Installing and upgrading technology and infrastructure components to give CBP agents ability to gain, maintain, and strengthen control of the border within proximity of the international boundary;
- 2) Including improved surveillance technology solutions to enhance border enforcement capabilities;
- 3) Applying surveillance technologies that would refine detection, interception, and apprehension of ICs, smugglers, and terrorists;
- 4) Reducing crime in border communities by detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.

1.3 PUBLIC INVOLVEMENT

1.3.1 Public Review

SBI*net* initiated public involvement and scoping activities as directed by 40 CFR Section 1501.7, 1503, and 1506.6 to identify any significant issues related to this proposed project. This process began in June 2007 through the issuance of 47 agency coordination letters to affected Federal, state and local agencies and affected Indian tribes, inviting their participation and input regarding this proposed project. Six responses were received. These letters and responses are included in Appendix A.

A public scoping meeting was held on July 17, 2007, in Tucson to present and discuss plans for this proposed project and to explain how this action would be analyzed in this EA. Members of the public in attendance were invited to provide comments and questions about the proposed project after the presentation. A transcript of this public scoping meeting is included in Appendix B.

A draft EA was released for a 30 day public review period beginning on June 5, 2008. A Notice of Availability (NOA) was published in both English and Spanish in the *Casa Grande Dispatch*, *Nogales International*, *Sierra Vista Herald*, and the *Arizona Daily Star* to announce the public comment period and the availability of the Draft EA. Copies of the various proofs of publication are contained in Appendix C. Comments received during the 30 day public review and comment period and SBI*net's* responses are included in Appendix A. During the 30-day public comment period, 24 letters and emails were received: four from Federal agencies, two from state agencies, four from non-governmental organizations, and 14 from private citizens. Most of these comments expressed concerns about the location of the towers; other comments referenced radio frequency and lighting affects on astronomical observatories and potential effects to wildlife, landscape, and threatened or endangered species. Where appropriate, the final EA has been revised to incorporate these comments into the analyses. A NOA for this final EA will be published in the *Casa Grande Dispatch*, *Nogales International*, *Sierra Vista Herald*, and *Arizona Daily Star* newspapers.

1.3.2 Agency Coordination

Coordination and consultation with stakeholder agencies and other potentially affected parties occurred at the initial preparation stages of this EA. This began in June 2007 through the issuance of agency coordination letters to affected Federal, state, and local agencies and affected Indian tribes, inviting their participation and input regarding the proposed project. Copies of correspondence generated during the preparation of this EA are presented in Appendix A. Formal and informal coordination was conducted with the following agencies:

- U.S. Fish and Wildlife Service (USFWS)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Department of Agriculture, Natural Resources Conservation Service (USDA, NRCS)
- Arizona Game and Fish Department (AGFD)
- Arizona State Historic Preservation Officer (SHPO)
- Arizona Department of Environmental Quality (ADEQ)
- Arizona Department of Transportation (ADOT)
- U.S. Section, International Boundary and Water Commission (USIBWC)
- U.S. Army Corps of Engineers (USACE)

1.4 COOPERATING AGENCIES

U.S. Department of the Interior (DOI) is a cooperating agency on SBI projects including the *SBI_{net}* proposed project included in this EA. A Memorandum of Agreement (MOA) was established between the DOI and CBP. A copy of the MOA is included in Appendix C.

1.5 FRAMEWORK FOR ANALYSIS

NEPA is the Federal statute that requires agencies to identify and analyze the potential environmental impacts of proposed Federal actions before those actions are taken. NEPA also established the CEQ as the executive agency charged with administering and interpreting NEPA's regulations (40 CFR 1500) and ensuring agencies' compliance with NEPA. The NEPA regulations mandate that all Federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that

might affect the environment. The NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decision-making.

The process for implementing NEPA is codified in 40 CFR 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, and DHS's *Management Directive 5100.1, Environmental Planning Program* (71 FR 16790). CEQ was established under NEPA to implement and oversee Federal policy in this process. The NEPA regulations specify that the following must be accomplished when preparing an EA:

- Briefly provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI);
- Aid in an agency's compliance with NEPA when an EIS is unnecessary; and
- Facilitate preparation of an EIS when one is necessary.

To comply with NEPA, the planning and decision-making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of this EA which enables the decision-maker to make a comprehensive analysis of potentially significant environmental issues and other environmental requirements associated with the proposed action, and to determine whether this proposed action has the potential to cause significant environmental effects in accordance with 40 CFR 1508.9.

As noted earlier, NEPA requires an inter-disciplinary approach to environmental analysis. To that end, Table 1-1 summarizes some of the applicable laws and regulations that guided the development of this EA. An inter-disciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists,

and historians, has analyzed the Proposed Action and alternative, in light of the existing conditions of the region and specific tower sites, and has identified relevant beneficial and adverse effects associated with the action. In addressing these effects, numerous guidelines, regulations, and Executive Orders (EO) were considered.

Table 1-1. Applicable Environmental Statutes and Regulations

Federal Statutes
Archaeological and Historical Preservation Act of 1974, as amended
Archaeological Resources Protection Act of 1979
Clean Air Act of 1955, as amended
Clean Water Act of 1977, as amended
Endangered Species Act of 1973, as amended
Migratory Bird Treaty Act of 1972
National Historic Preservation Act of 1966, as amended
National Environmental Policy Act of 1969, as amended
National Wildlife Refuge System Improvement Act of 1997
Watershed Protection and Flood Prevention Act of 1954
Wild and Scenic Rivers Act of 1968, as amended
Farmland Protection Policy Act of 1980
Native American Graves Protection and Repatriation Act of 1990
Executive Orders (EO), Memorandums, etc.
Floodplain Management (EO 11988) of 1977
Protection of Wetlands (EO 11990) of 1977
Federal Actions to Address Environmental Justice to Minority Populations and Low-Income Populations (EO 12898) of 1994
Protection of Children from Environmental Health Risks (EO 13045) of 1997
Protection of Migratory Birds & Game Mammals (EO 11629) of 2001
Indian Sacred Sites (EO 13007) of 1996
Consultation and Coordination with Indian Tribal Governments (EO 13175) of 2000
Government-to-Government Relations with Native American Tribal Governments (Presidential Memorandum) of 1994

SECTION 2.0
PROPOSED ACTION AND ALTERNATIVES

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVES AND ALTERNATIVES SELECTION

As the proponent agency preparing this EA, CBP developed a range of alternatives with consideration of the purpose and need outlined above and of the potential effects to the environment. The purpose of this project is to support CBP's mission through enhancing technological capabilities in support of a COP capable of assessing a high frequency and volume of illegal activities over a vast area of the border region. To this end, CBP considered various technological systems and equipment capable of providing spatially and temporally continuous surveillance across the entire 81-mile border region of this project. Each of these alternatives was fully evaluated in terms of the purpose and need, as well as costs, operability, and potential impacts to the environment. Alternatives which did not fully meet the purpose of this project, or which presented environmental concerns, were eliminated from further analysis and are discussed in Section 2.5, below. The Proposed Action, described in Section 2.3, is the only alternative which fully meets the purpose of this project within the constraints of environmental and operational considerations and is the only action alternative assessed in this EA. The No Action Alternative, described in Section 2.4, is assessed as required by CEQ.

2.2 CRITERIA FOR TOWER SITE SELECTION

The sensor and communications tower site selection process identifies potential suitable site locations and their alternatives. Key tower site evaluation considerations take into account constructability, operability, and environmental factors. The site selection process began with a conceptual field laydown, where maximum surveillance capability is achieved with a minimal number of tower sites established using mapping programs and a modeling and analysis process. Operationally preferred site locations were then selected by CBP personnel based on their knowledge of the terrain, environment, land ownership, and operations. Selected tower sites were then screened

for constructability, operability, and environmental constraints. The selection process was then iterated until full surveillance and communications were provided in areas where screening eliminated tower sites.

The site selection team first employed a Wide Area Surveillance Sensor Placement Tool (WASSPT) which is a four-stage, integrated analysis, and visualization tool for cost-effective placement of towers across areas of interest. The WASSPT helps determine the minimum number of towers needed for maximum coverage of a given area. After a conceptual field laydown of prospective tower sites is agreed to by CBP, the project's environmental, construction, and operational team personnel conducted site visits and completed site visit reports with site ranking matrices for each site. During site visits, project team personnel used site ranking criteria to establish whether sites exhibit exclusionary, restrictive, and/or selective characteristics from constructability, operability, and/or environmental criteria perspectives.

The *SBI_{net}* Tucson West project preliminary site surveys were conducted in July 2007, following an intensive mapping exercise in with CBP and DHS personnel. Detailed environmental and cultural surveys followed beginning in October 2007. During those surveys, over 74 sites were initially evaluated by additional team personnel for both sensor and communication efficiencies and included overall compatibility with *SBI_{net}* network design and connectivity. Of the sites surveyed, 52 sites were eliminated as unsuitable for tower construction due to terrain or access considerations, the presence of cultural and/or sensitive resources, or technical requirements that could not be met in a particular location. These sites are summarized in Table 2-1. The reasons for their elimination as proposed tower sites are provided. Additional biological and cultural surveys were performed in late 2007 and early 2008 to ensure all additional proposed tower sites were evaluated as required.

Table 2-1. Alternate Sites Proposed but Rejected

Tower ID	Station	Reason for Rejection*
TCA-AJO-005	Ajo	O
TCA-AJO-007	Ajo	T
TCA-AJO-089	Ajo	O
TCA-AJO-090	Ajo	C
TCA-CAG-171	Casa Grande	T
TCA-TUS-030	Tucson	O,T
TCA-TUS-031	Tucson	E
TCA-TUS-033	Tucson	O
TCA-TUS-034	Tucson	O
TCA-TUS-039	Tucson	O,T
TCA-TUS-104	Tucson	O, T
TCA-TUS-105	Tucson	O, T
TCA-TUS-106	Tucson	O
TCA-TUS-107	Tucson	O, T
TCA-TUS-183	Tucson	T
TCA-TUS-186	Tucson	T
TCA-TUS-196	Tucson	T
TCA-TUS-221	Tucson	O, T
TCA-TUS-222	Tucson	O, T
TCA-TUS-288	Tucson	O,T
TCA-TUS-289	Tucson	O,T
TCA-TUS-292	Tucson	O,T
TCA-TUS-293	Tucson	O,T
TCA-TUS-297	Tucson	O,T
TCA-TUS-306	Tucson	O,C, E
TCA-TUS-307	Tucson	O,C, E
TCA-NGL-051	Nogales	O,T
TCA-NGL-053	Nogales	C
TCA-NGL-110	Nogales	O,T, E
TCA-NGL-111	Nogales	O
TCA-NGL-114	Nogales	O,T
TCA-NGL-137	Nogales	O, T
TCA-NGL-138	Nogales	O, T
TCA-NGL-139	Nogales	O, T
TCA-NGL-140	Nogales	O, T
TCA-NGL-141	Nogales	O, T
TCA-NGL-142	Nogales	O, T
TCA-NGL-194	Nogales	O, T
TCA-SON-116	Sonoita	O, T, C, E
TCA-SON-118	Sonoita	O,T,E
TCA-SON-119	Sonoita	T
TCA-SON-143	Sonoita	O, T
TCA-SON-144	Sonoita	O,T
TCA-SON-145	Sonoita	O,T,E
TCA-SON-182	Sonoita	O,T,C
TCA-SON-206	Sonoita	O,T
TCA-SON-207	Sonoita	T
TCA-SON-208	Sonoita	O, T, C, E
TCA-SON-219	Sonoita	T
TCA-SON-223	Sonoita	T
TCA-SON-224	Sonoita	T

O—operational, T—technical, C—constructability, E—environmental

2.3 PROPOSED ACTION

The Proposed Action analyzed in this EA is an USBP sector-based project and component of the *SBI*net program known as the *SBI*net Tucson West project. The Proposed Action includes the construction, upgrade, operation, and maintenance of 54 sensor and communication towers and associated access roads, which creates a communications network in support of a COP among components of CBP and other Federal, state, and local partners outside CBP. Information gathered as part of CBP operations, including vehicles upgraded with COP connectivity and placement of unattended ground sensors, would further contribute to the COP. The COP would also provide mechanisms to communicate comprehensive situational awareness, including information to incorporate intelligence-driven capabilities at all operational levels and locations.

Three vehicle mobile surveillance systems per station and Unattended Ground Sensors (UGS) are also proposed under this *SBI*net project, but are not analyzed as a part of the Proposed Action because their potential impacts are benign. They are an integral part of the overall COP border environment and, as such, are briefly discussed herein. The existing CBP vehicles will be retrofitted with technologies to allow CBP agents to acquire/send information via the new surveillance and communication towers. The UGS would be placed in disturbed areas where no vegetation would have to be removed for deployment. The intent of the upgraded vehicles, combined with the towers and UGS is to make CBP enforcement actions more efficient and effective. If this is reached, fewer vehicle trips should be required.

The Proposed Action described in this EA represents the current view CBP's plan to develop technology, infrastructure, transportation assets, and deployment of CBP personnel to achieve operational control of 81 miles of border in the Tucson Sector. Technology to be considered in the design includes: sensors and other surveillance assets; and communications, command and control systems along the border, within command centers, within vehicles, and among CBP personnel. Infrastructure to be

considered within this plan includes roadways along the border and to/from surveillance assets, communications and sensor towers, and utilities.

As part of the COP, the 54 towers would be able to communicate with the network, with the station that they operate under (*i.e.*, Ajo, Casa Grande, Tucson, Nogales and Sonoita stations), and with Tucson Sector Headquarters, providing a overall network system of communications and surveillance along the entire 81-mile border area (Figure 2-1a and b).

The 54 towers included in the Proposed Action contain upgrades to 12 existing towers (seven existing CBP towers, one tower located at the new proposed Ajo Station, and four existing commercial towers). Impacts resulting from the construction of the 42 new towers and the retrofit/replacement of the 12 existing towers are fully assessed in this EA; however, upgrades to the existing towers are considered to be environmentally benign due to the fact the areas are currently disturbed and no further ground disturbance would occur. One of the 12 towers is actually a replacement tower, which would be located at the new Ajo Station that is currently under construction. This tower would be located within an area, which has already been fully analyzed under a previous EA (CBP 2007b). The remaining 11 towers would only receive retrofits or upgrades to the current tower communications hardware arrays.

The 12 existing towers (including the one proposed Ajo Station tower) are summarized below in Table 2-2. The four commercial towers have been utilized by CBP for several years for land mobile radio (LMR) communication needs and have communications hardware arrays on the commercial tower structure. These towers have been referred to as P25 towers by CBP. Two P25 towers, TCA-CAG-195 and TCA-TUS-291 would require access road repair, or new approach road construction; therefore, the ground disturbing activities are analyzed for these towers as well as for the other 42 towers in this EA.

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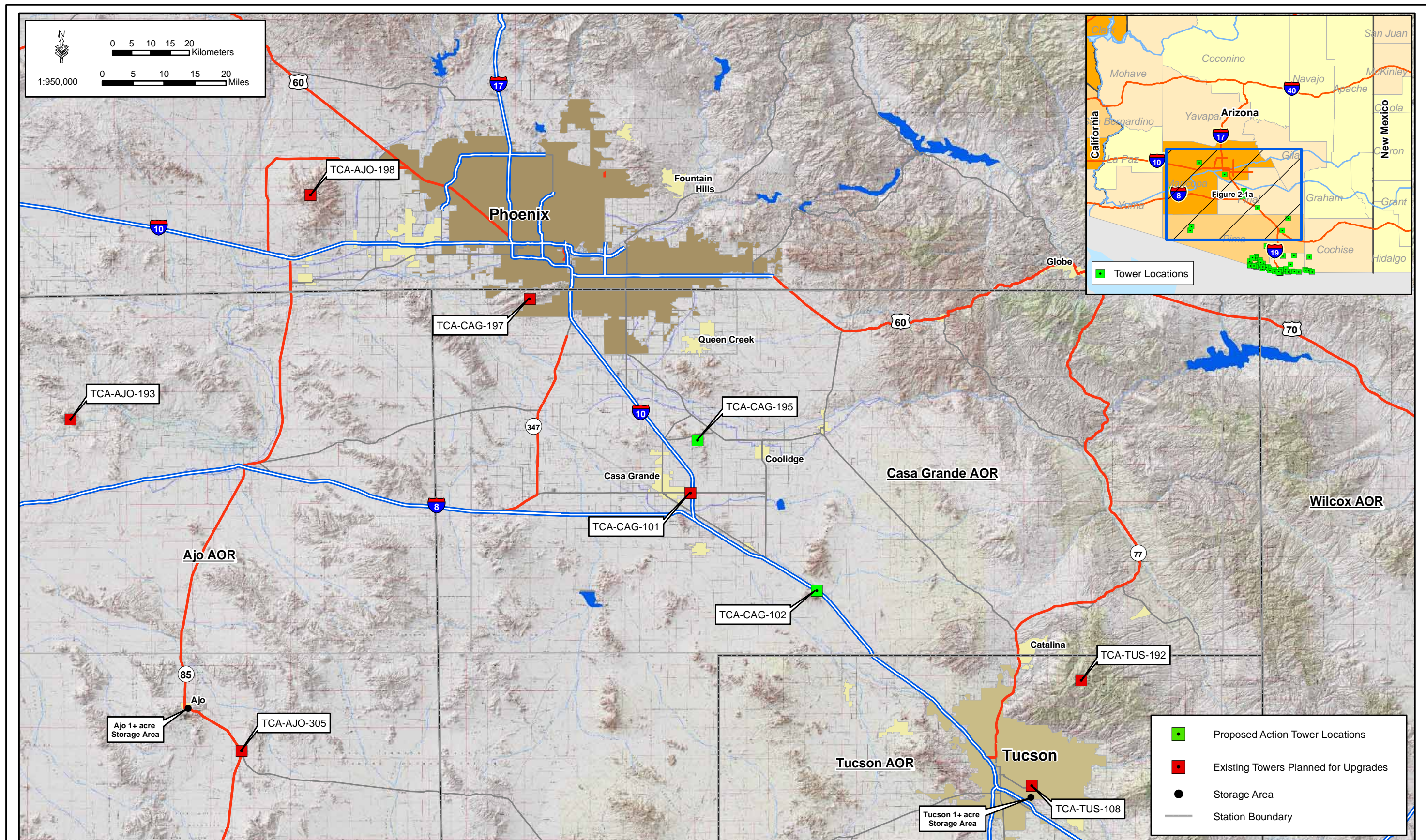


Figure 2-1a: Project Location Map



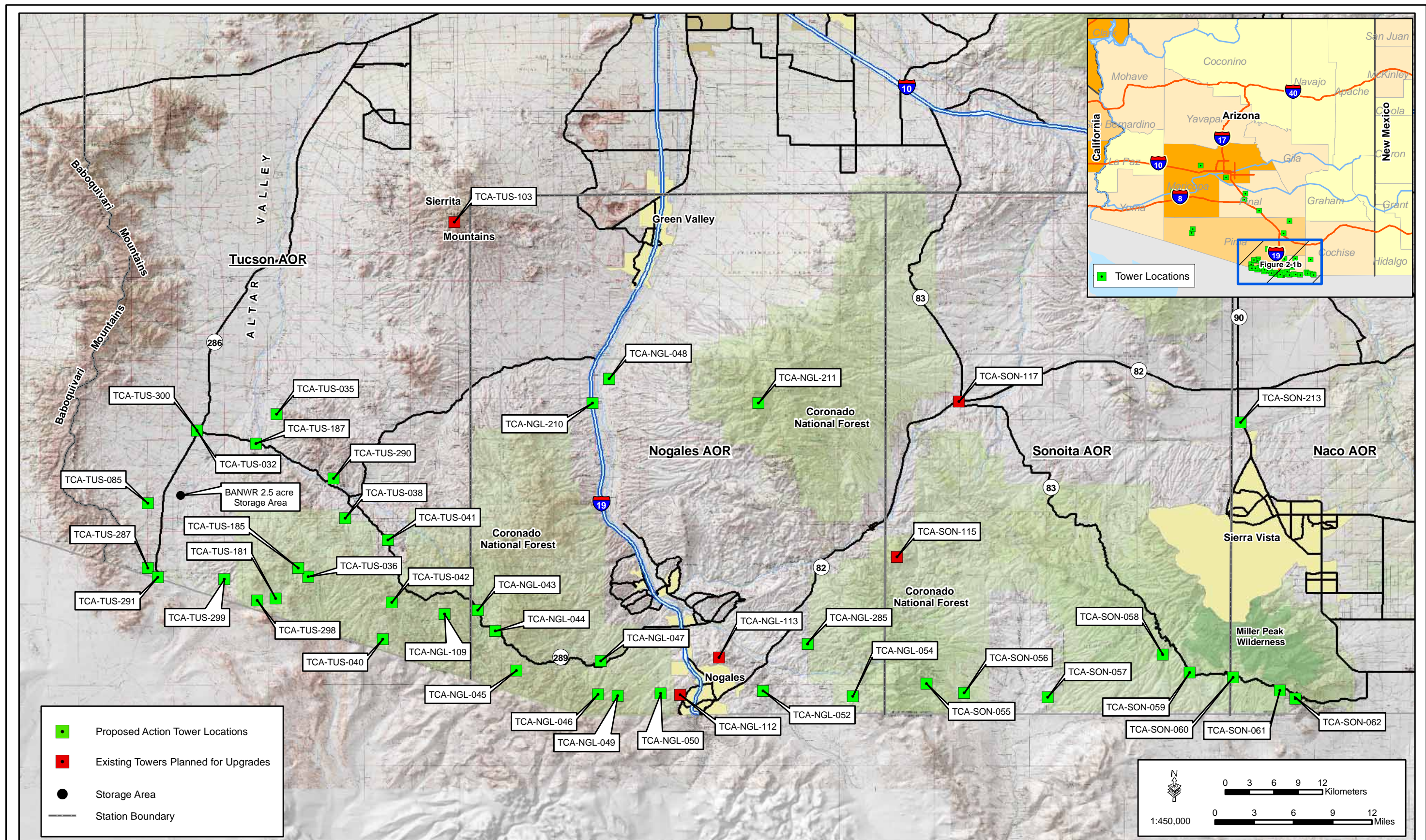


Figure 2-1b: Project Location Map



Table 2-2. Existing or Proposed Towers Planned for Upgrades

Tower ID	Type	Station	Status
TCA-AJO-193	P25	Ajo	Commercial
TCA-AJO-198	P25	Ajo	Commercial
TCA-AJO-305	Tower on new proposed station*	Ajo	CBP
TCA-CAG-101	Casa Grande Station relay tower	Casa Grande	CBP
TCA-CAG-197	P25	Casa Grande	Commercial
TCA-TUS-103	Repeater sector tower	Tucson	CBP
TCA-TUS-108	Tucson Station relay tower	Tucson	CBP
TCA-TUS-192	P25	Tucson	Commercial
TCA-NGL-112	Nogales Station relay tower	Nogales	CBP
TCA-NGL-113	Existing sector tower	Nogales	CBP
TCA-SON-115	Existing sector tower	Sonoita	CBP
TCA-SON-117	Sonoita Station relay tower	Sonoita	CBP

*New tower will be upgraded. The tower and station construction were addressed in a separate EA.

Impacts resulting from the construction, operation, and maintenance of the remaining 42 proposed tower sites and their associated access roads, and utility needs will be the focus of this EA. The 42 proposed towers, separated by station, are as follows:

Casa Grande Station AOR (2 proposed tower sites)	Tucson Station AOR (17 proposed tower sites)	Nogales Station AOR (14 proposed tower sites)	Sonoita Station AOR (9 proposed tower sites)
TCA-CAG-102	TCA-TUS-032	TCA-NGL-043	TCA-SON-055
TCA-CAG-195	TCA-TUS-035	TCA-NGL-044	TCA-SON-056
	TCA-TUS-036	TCA-NGL-045	TCA-SON-057
	TCA-TUS-038	TCA-NGL-046	TCA-SON-058
	TCA-TUS-040	TCA-NGL-047	TCA-SON-059
	TCA-TUS-041	TCA-NGL-048	TCA-SON-060
	TCA-TUS-042	TCA-NGL-049	TCA-SON-061
	TCA-TUS-085	TCA-NGL-050	TCA-SON-062
	TCA-TUS-181	TCA-NGL-052	TCA-SON-213
	TCA-TUS-185	TCA-NGL-054	
	TCA-TUS-187	TCA-NGL-109	
	TCA-TUS-287	TCA-NGL-210	
	TCA-TUS-290	TCA-NGL-211	
	TCA-TUS-291	TCA-NGL-285	
	TCA-TUS-298		
	TCA-TUS-299		
	TCA-TUS-300		

In order to construct the proposed towers and access roads, CBP plans to purchase or lease private, state, or county lands; or employ special use permits on public lands, as necessary. In general, three types of tower structures are proposed for this project: self

standing towers (SST), rapidly deployed towers (RDT), and a third type of tower design called a Ravens Butte (RB). The RB tower is proposed to be utilized at one tower site (TCA-NGL-109) and is a small skid-mounted tower which would require helicopter deployment. RDT and RB towers are temporary structures than can be disassembled if necessary.

Access roads would need to be improved or constructed in order to install, operate, and maintain the proposed towers. The new access roads would be constructed to provide a 12-foot wide driving surface with 2-foot shoulders on each side (16 feet total). Additionally, some of the new roads may require cut and fill while others may require a v-ditch on one side of the new road. If cut-and-fill would be required the construction impact could extend as much as 22 feet on either side of new roads (yielding an impact corridor 56 feet wide). Road repair would include minor grading, leveling, and installation of nuisance drainage structures, while road improvements would include reconstruction, widening, or straightening of the existing road, and installation of major drainage structures.

As mentioned above proposed tower TCA-NGL-109 would require helicopter deployment. Two other proposed towers, could also require helicopter deployment; although, the possibility exists that they may not be installed by helicopter but instead by vehicle via access roads. Both installation methods will be analyzed in this EA.

Currently the three main storage areas, as well as the individual staging areas at each proposed tower site would be utilized for tower and associated access road work (see Figure 2-1a and b). The three main storage areas are located:

- at an existing 1-acre industrial warehouse facility in south Tucson near Interstate 10 (I-10), and would facilitate the construction of the proposed towers;
- at an existing 2.5-acre maintenance and construction facility on the Buenos Aires National Wildlife Refuge (BANWR), and will facilitate the construction of the proposed towers located in and around the BANWR; and,
- at an existing 1-acre warehouse facility in northeast Ajo near State Route (SR) 85.

Each tower would have the subsequent design, power requirements, and site and fence enclosure footprint, unless otherwise noted in the following detailed proposed tower site discussions:

- Tower height – approximately 80 to 120 feet high, although SSTs can be higher than 120 feet without guy wires and RB towers would be much shorter;
- Power source – commercial grid power (where available) or a propane hybrid generator system with solar capabilities; and a 1,000 gallon propane fuel tank;
- Commercial grid power – all power lines would be installed either overhead or in buried cables from the main trunk line to the tower site shelter and then on an elevated cable tray to the tower¹. If commercial power is utilized then the installation of overhead or buried lines would be placed within surveyed road construction buffer areas, all of which would need to be verified to not impact biological and cultural resources along access roads;
- A 10- X 12-foot equipment shelter would be within the perimeter fencing of each proposed tower site. The shelter would be installed on a precast concrete pad;
- Site permanent footprint – could be up to 100- X 100-foot, including the 50- X 50-foot or 80- X 80-foot tower site and a maintained fire buffer. The fire buffer would be maintained free of vegetation;
- Site construction footprint – 100- X 100-foot; and
- Fence enclosure footprint: 50- X 50-foot X 8-foot or 80- X 80-foot X 8-foot chainlink with 3 strands of barbed wire at the top of the perimeter security fence enclosure surrounding the tower and its associated equipment shelter.

The 100- X 100-foot construction footprint for each proposed tower would be cleared and grubbed, although prior to any land disturbance, measures outlined in Section 5.0 will be in place to control erosion and minimize potential environmental effects. Individual tower staging areas will be within this construction footprint. The construction time for each proposed tower site is expected to be approximately 60 days and, in

¹ Although 9 new or replacement SBI*net* Tucson West towers are currently planned to be powered by commercial grid power there may be instances when commercial power may not be available immediately upon tower deployment. In that case, the power source would be supplied by a 35 kilowatt (kW) generator hybrid system until the commercial power infrastructure is in place. All 9 of these towers which are currently planned to be powered from commercial grid power are 3 miles or less from power service connections.

general, would occur during daylight hours; however, it is possible due to construction schedule constraints that some night-time construction could occur.

Typical designs for the sensor and communications towers consist of the following components: sensor towers equipped with multiple cameras (electro-optical/infrared sensors, video cameras), radio-frequency radar, and data receiving antennas. Each communications tower is expected to be equipped with one or more of the following communications components: parabolic dishes, microwave relays, and/or data receiving antennas. Combination sensor and communication towers would have the following components: multiple cameras (electro-optical/infrared sensors, video cameras), radio-frequency radar, parabolic dishes and microwave relays, and data receiving antennas.

Components would be mounted on each tower between approximately 20 to 200 feet above ground level, depending on the local terrain. The exact number and type of equipment would depend on the number and types of cameras used, the area to be monitored, and other design variables. Additionally, one or more solid parabolic antennas would be mounted on platform railings or on a separate antenna mount (not to exceed 13 feet). Cameras would be installed at heights that would ensure satisfactory views and provide clear pathways for transmission of information to relay stations and CBP stations. Towers generally require line-of-sight (LOS) to ensure clear microwave transmission signals from tower to tower.

Federal Aviation Administration (FAA) permits are necessary for all towers which exceed 200 feet. Additionally, FAA required lighting would be installed on towers that exceed 200 feet. Currently, only one proposed tower, TCA-SON-213 will be over 200 feet high. Lighting will be installed in accordance with FAA regulations, standards, and guidelines for the lighting of tower structures found in 14 CFR Section 77 and FAA Advisory Circulars AC 150/5345-43f and AC 70/7460-1K. Any infrared lighting installed on the proposed towers would be compatible with night vision goggle usage.

When tower facility lighting is deemed necessary to meet FAA regulations or CBP operational needs, such as infrared lighting, USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* would be implemented to reduce night-time atmospheric lighting and the potential adverse effects of night-time lighting to migratory birds, nocturnal flying species, and nearby astronomical observatories. If the tower sites are illuminated for CBP security purposes then lighting would: utilize low sodium bulbs, prevent illumination trespass outside the footprint of the tower site, and when possible, be activated by motion detectors.

SSTs are steel, lattice-style structures which have three circular concrete pilings approximately 4 feet in diameter, and would be placed at each site to anchor the tower legs in the ground (Figure 2-2). Depth of the pilings is dependent on tower height and geotechnical characteristics at each tower site, but would not go deeper than 30 feet below ground surface (bgs).

RDTs are lattice style structures which use pre-cast modular stacked slabs for the foundation and are typically 8- X 8-foot X 6 inches and 10- X 10-foot X 6 inches depending upon tower height (Figure 2-3). The lowermost foundation slab rests on top of approximately 2 feet of crushed stone at the base of the excavated area. The depth of each tower foundation is dependent on tower height and geotechnical characteristics at each tower site. Tower foundations could be placed to a depth of 12 to 15 feet bgs depending on tower height and geotechnical characteristics at each tower site. The uppermost tower foundation slab may potentially extend from 7 inches to 26 inches above the existing surface grade.

Proposed tower, TCA-SON-062 would be located at the National Park Service (NPS) Coronado National Memorial Montezuma Pass overlook and would also require that the park overlook restroom be relocated. The restroom would be very near where it currently exists and within a previously disturbed site. No flushing or running water would be required as it would be a composting facility as it is currently.

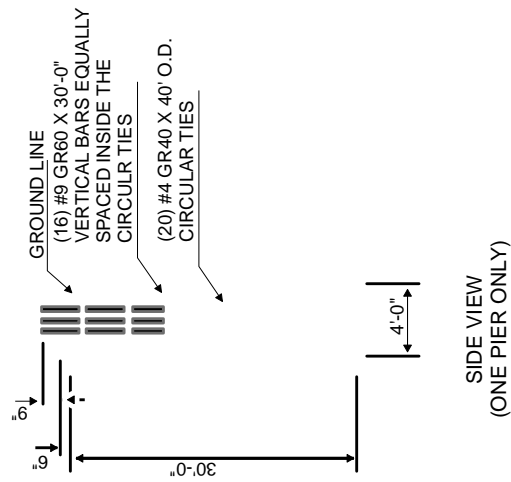
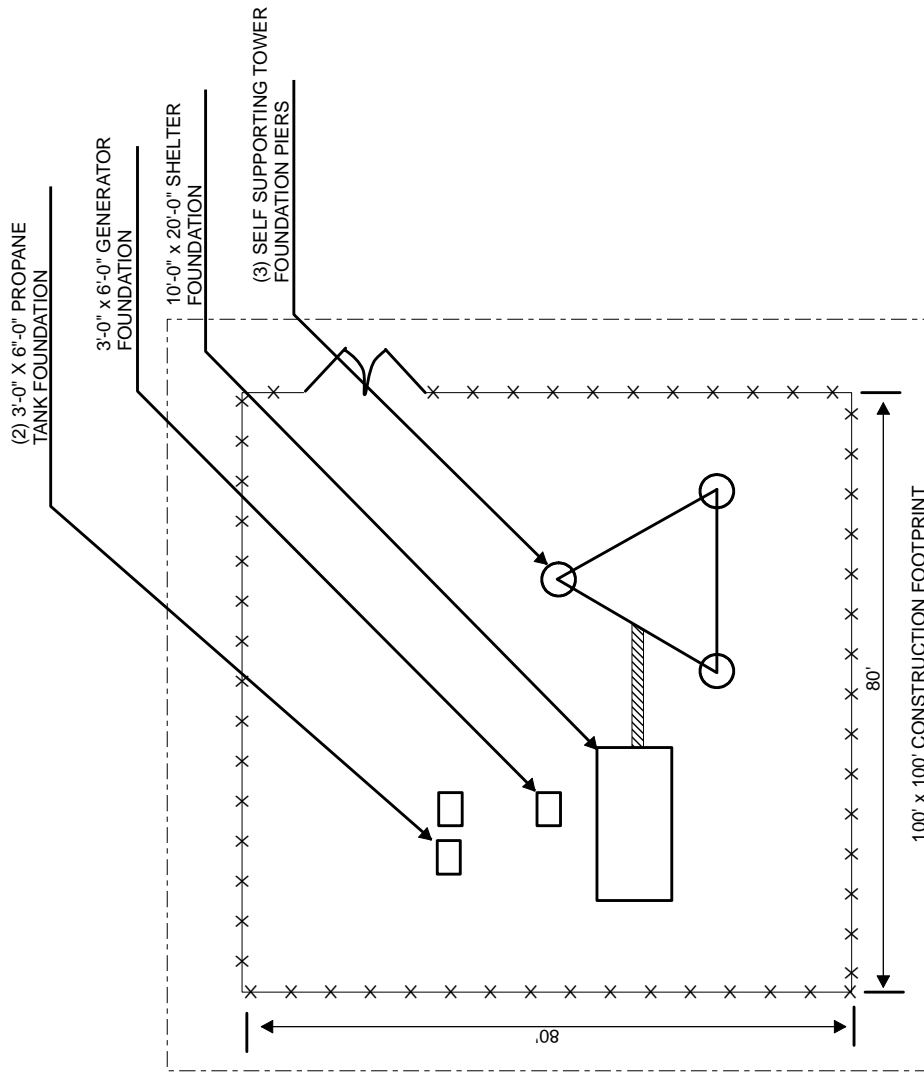


Figure 2-2: Self Standing Tower Foundation Schematic

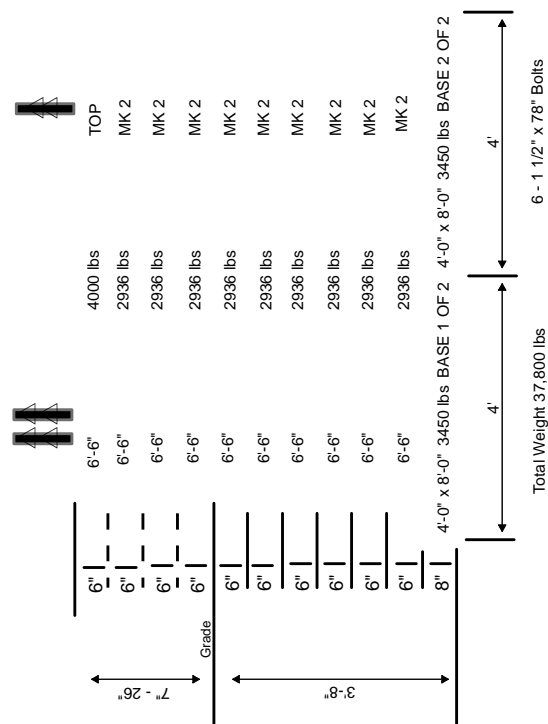


Figure 2-3: RDT Stacking Slab Tower Foundation Schematic

As part of the Proposed Action, the towers would require bi-monthly maintenance for the RRVS towers, while communication towers would require monthly maintenance visits. This necessitates vehicle travel to each of the proposed tower sites for propane delivery, maintenance, and operations of the towers. For the proposed towers that may be installed by helicopter, they would require maintenance activities via helicopter.

CBP is coordinating with USFWS regarding five tower sites that are proposed for the BANWR. Construction of these five sites is contingent upon a USFWS determination that they are appropriate and compatible uses in the BANWR.

Based on discussions with various resource agencies, *SBI*net has agreed that 12 months after any tower in the proposed project is not determined to be functional *SBI*net will remove the tower(s) and remediate any impacts caused by the tower construction, operation, and removal.

The following discussion is a detailed description of each of the proposed new or replacement towers, excluding the 12 existing towers included in Table 2-2. A summary table of pertinent information on each tower site and its configuration is provided in Appendix D. Within the following proposed tower descriptions, new roads would consist of blading of in situ materials, tower access road improvements would include reconstruction of the existing road, and installation of major drainage structures, and road repair would include minor grading, leveling, and installation of nuisance drainage structures.

2.3.1 Casa Grande AOR Proposed Tower Descriptions

Tower ID: TCA-CAG-102

Type of Tower: CRT

Tower Foundation: SST

Tower Height: Approximately 120 feet

Station: Casa Grande

Location: Pinal County

Land Use: Privately-owned land

Location Description: The proposed tower site for TCA-CAG-102 is located approximately 35 miles northwest of Tucson, Arizona (Figure 2-4).

Tower Access: Access to the proposed site is via an existing road called East Camino Adelante Road. No improvements or repair to the existing access road are needed.

Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-CAG-195

Type of Tower: CRT

Tower Foundation: Existing SST, lattice

Tower Height: Approximately 100 feet

Station: Casa Grande

Location: Pinal County

Land Use: Gila Indian Reservation

Location Description: The proposed tower site for TCA-CAG-195 is located approximately 70 miles northwest of Tucson, Arizona and is directly accessed from SR 387 (see Figure 2-4).

Tower Access: Access road repair (3,570 feet) are required to facilitate tower installation and maintenance.

Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

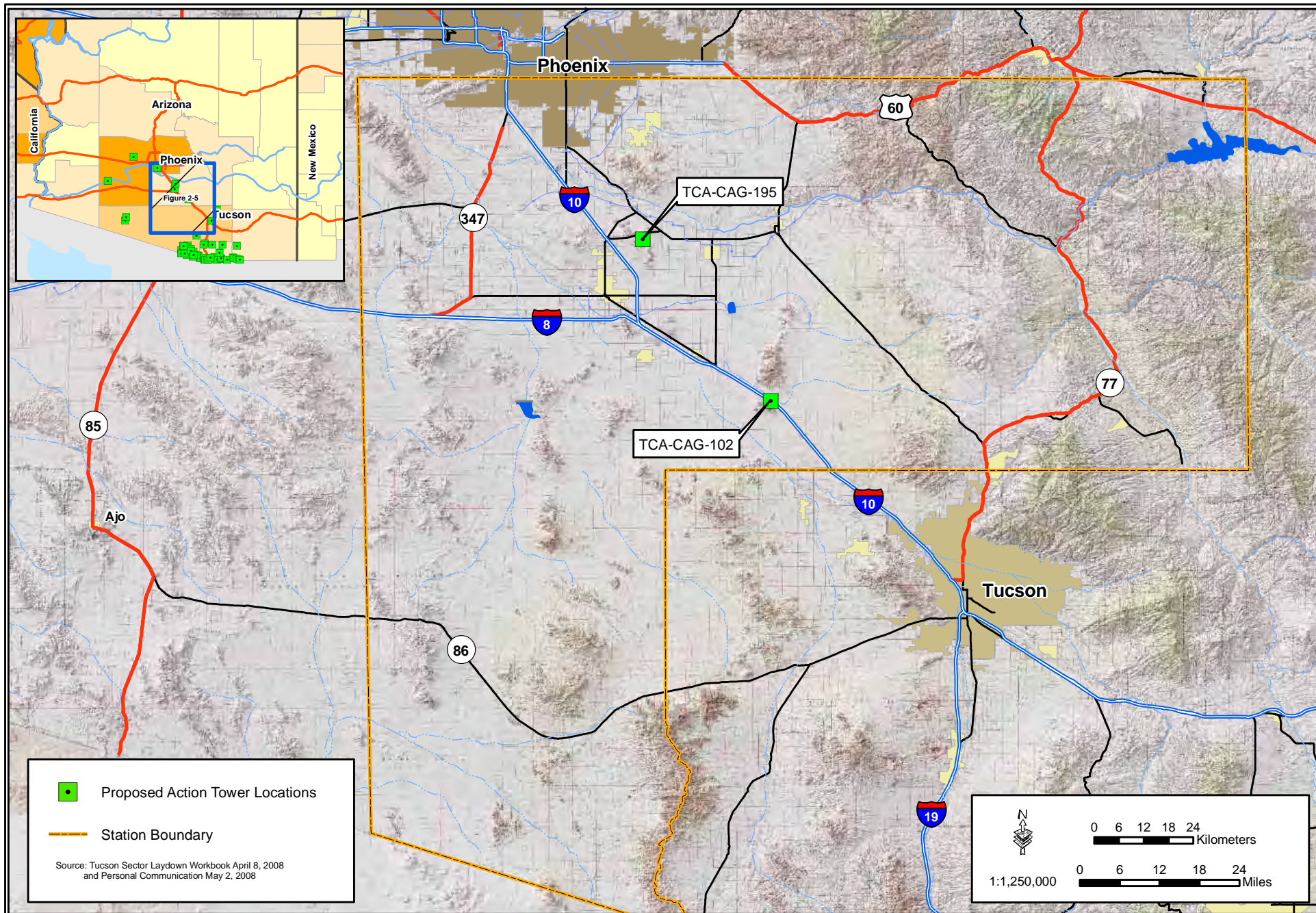


Figure 2-4: Casa Grande AO Proposed Towers

2.3.2 Tucson AOR Proposed Tower Descriptions

Tower ID: TCA-TUS-032

Type of Tower: RRVs or an RRVs-CRT

Tower Foundation: RDT or a SST

Tower Height: Up to 120 feet for RDT, or up to 180 feet if a SST

Station: Tucson

Location: Pima County

Land Use: Pima County land - BANWR

Location Description: The proposed tower site for TCA-TUS-032 is approximately 453 feet west of SR 286, also known as South Sasabe Road (Figure 2-5).

Tower Access: Access to the site is via an existing unimproved BANWR access road. No improvements or repair to the existing access road would be needed.

Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-TUS-035

Type of Tower: RRVs-CRT

Tower Foundation: RDT

Tower Height: Up to 120 feet

Station: Tucson

Location: Pima County

Land Use: BANWR

Location Description: The proposed tower site for TCA-TUS-035 is approximately 33 miles south of Three Points, Pima County, Arizona on the BANWR (see Figure 2-5).

Tower Access: Access to the site from West Arivaca-Sasabe Road is via an existing unimproved BANWR access road. A small amount of new access road construction (42 feet) would be needed to facilitate tower installation and maintenance. Approximately 52 cubic yards of fill would need to be brought on-site for tower site grading at a site identified by and agreed to be BANWR land management plans and personnel.

Type of Primary Power: Generator-solar hybrid

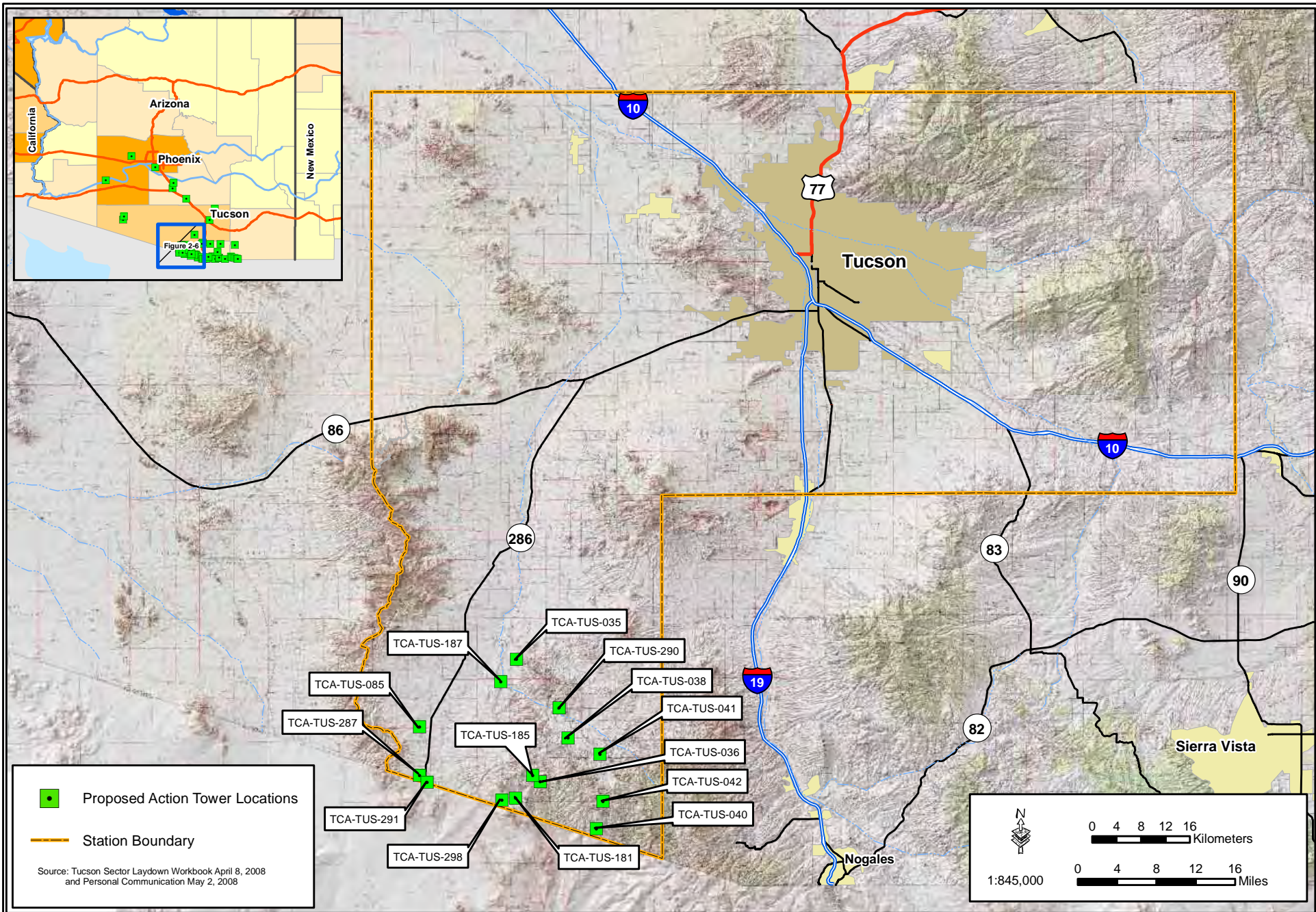


Figure 2-5: Tucson AO Proposed Towers

Tower ID: TCA-TUS-036
Type of Tower: RRVs-CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: Coronado National Forest (CNF)
Location Description: The proposed tower site for TCA-TUS-036 is approximately 262 feet west of Tres Boleros Road (see Figure 2-5) and is along a low ridge south of Black Mesa.
Tower Access: Access to the site from the maintained Tres Bellotas is via an existing unimproved U.S. Forest Service (USFS) access road. A small amount of access road improvements (55 feet) would be necessary for tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-038
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: CNF near an existing P28 mobile tower site
Location Description: The proposed tower site for TCA-TUS-038 is approximately 76 feet east of Tres Bellotas Road (see Figure 2-5). The proposed site is predominately undeveloped and has high and dense grass cover.
Tower Access: Access to the site is from the USFS-maintained Tres Bellotas Road access road. A small amount of access road repair (25 feet) would be necessary for tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-040
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Santa Cruz County
Land Use: CNF
Location Description: The proposed tower site for TCA-TUS-040 is approximately 11 miles south of Arivaca, Arizona, on the CNF between Bonita Canyon and Holden Canyon and the International Border is approximately 3.9 miles to the south (see Figure 2-5).
Tower Access: Currently, it has not been determined if tower installation would be via access roads or helicopter airlift therefore this document will analyze impacts for both deployment method. Road access to the site is from Tres Bellotas Road via Dead Horse Ridge Road. Access road repair (13,995 feet) and some new road construction (1,138 feet) may be necessary for tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-041
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: CNF - Cattle grazing
Location Description: The proposed tower site for TCA-TUS-041 is approximately 156 feet east of SR 289 also known as South Ruby Road.
Tower Access: Access to the site from South Ruby Road is via an existing unimproved jeep trail. Access road improvements (128 feet) would be necessary for tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID:	TCA-TUS-042
Type of Tower:	RRVS
Tower Foundation:	RDT
Tower Height:	Up to 120 feet
Station:	Tucson
Location:	Santa Cruz County
Land Use:	CNF - Undeveloped
Location Description:	The proposed tower site for TCA-TUS-042 is approximately 1.1 miles southwest of SR 289 also known as South Ruby Road and situated on the northeastern slope of the Cobre Mountain (see Figure 2-5).
Tower Access:	Access to the site from South Ruby Road is via Warsaw Canyon Road and Forest Service Road (FSR) 4175 (Cobre Road). Currently, it has not been determined if tower installation would be via access roads or helicopter airlift therefore this document will analyze impacts for both deployment method. Access road repair (6,155 feet) and a very small amount of new road construction (3 feet) within the tower compound may be necessary for tower installation and maintenance.
Type of Primary Power:	Generator-solar hybrid
Tower ID:	TCA-TUS-085
Type of Tower:	RRVS
Tower Foundation:	RDT
Tower Height:	Up to 120 feet
Station:	Tucson
Location:	Pima County
Land Use:	BANWR land - Undeveloped
Location Description:	The proposed tower site for TCA-TUS-085 is approximately 1 mile west of SR 286, also known as South Sasabe Road, situated on a low grassy ridge with dense grass coverage.
Tower Access:	Access to the site from South Sasabe Road is via an existing BANWR maintained access road. Access road repair (825 feet) and a small amount of new road construction (33 feet) would be necessary to facilitate tower installation and maintenance.
Type of Primary Power:	Generator-solar hybrid

Tower ID: TCA-TUS-181
Type of Tower: CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: CNF
Location Description: The proposed tower site for TCA-TUS-181 is approximately 64 miles southwest of Tucson (see Figure 2-5).
Tower Access: Access road repair (2,107 feet) and a small amount of new road construction (48 feet) would be necessary to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-185
Type of Tower: CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: CNF - Recreational use
Location Description: The proposed tower site for TCA-TUS-185 is approximately 63 miles southwest of Tucson (see Figure 2-5).
Tower Access: Access road repair (4,519 feet) and a small amount of new road construction (49 feet) would be necessary to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-187
Type of Tower: CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: BANWR
Location Description: The proposed tower site for TCA-TUS-187 is approximately 55 miles southeast of Tucson (see Figure 2-5) and can be accessed from Arivaca Road.
Tower Access: New access road construction (136 feet) would be necessary to facilitate tower installation and maintenance from Arivaca Road to the tower site. Additionally, a 16 foot wide gate would be installed at an existing fence.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-287
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: BANWR
Location Description: The proposed tower site for TCA-TUS-287 is located 1 mile northwest of the Sasabe POE and approximately 0.5 miles north of the International Border (see Figure 2-5).
Tower Access: A small amount of road improvements (98 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-TUS-290
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use : Privately-owned land
Location Description: The proposed tower site for TCA-TUS-290 is located 1.8 miles northwest of Arivaca approximately 12 miles north of the International Border (see Figure 2-5).
Tower Access: New access road construction (58 feet) and road repair (50 feet) would be needed to facilitate tower installation and maintenance. Additionally, an irrigation or livestock water line may be buried underground and encased in concrete.
Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-TUS-291
Type of Tower: CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use : CBP
Location Description: The proposed tower site for TCA-TUS-291 is located within the Sasabe POE and access to the site would be off of SR 286 (South Sasabe Road) (see Figure 2-5).
Tower Access: New access road construction (70 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-TUS-298
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: CNF
Location Description: The proposed tower site for TCA-TUS-298 is located north of Tres Boleros Road and is approximately 0.7 mile north of the International Border (see Figure 2-5).
Tower Access: New access road construction (1,872 feet) would be needed to facilitate tower installation and maintenance. Additionally, a 16 foot wide gate will be installed.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-TUS-299
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Tucson
Location: Pima County
Land Use: BANWR
Location Description: The proposed tower site for TCA-TUS-299 is located 1.6 miles north of the International Border (see Figure 2-5).
Tower Access: New access road construction (50 feet) would be required to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCS-TUS-300

Type of Tower: CRT

Tower Foundation: Existing SST

Tower Height: NA

Station: Tucson

Location: Pima County

Land Use: Pima County land – BANWR near an existing USFWS tower

Location Description: TCA-TUS-300 is located northwest of SR 286 and Arivaca Sasabe Road and is directly southwest approximately 550 feet from proposed tower TCA-TUS 306 (see Figure 2-5).

Tower Access: No access road construction, repair, or improvements would be required to facilitate tower installation and maintenance.

Type of Primary Power: Generator-solar hybrid

2.3.3 Nogales AOR Proposed Tower Descriptions

Tower ID: TCA-NGL-043

Type of Tower: RRVS

Tower Foundation: RDT

Tower Height: Up to 120 feet

Station: Nogales

Location: Santa Cruz County

Land Use: CNF - Undeveloped

Location Description: The proposed tower site for TCA-NGL-043 is approximately 19 miles west of Nogales, Arizona (Figure 2-6).

Tower Access: Access to the site is from the existing access road, Ruby Road or SR 289. New access road construction (439 feet) would be needed to facilitate tower installation and maintenance.

Type of Primary Power: Generator-solar hybrid

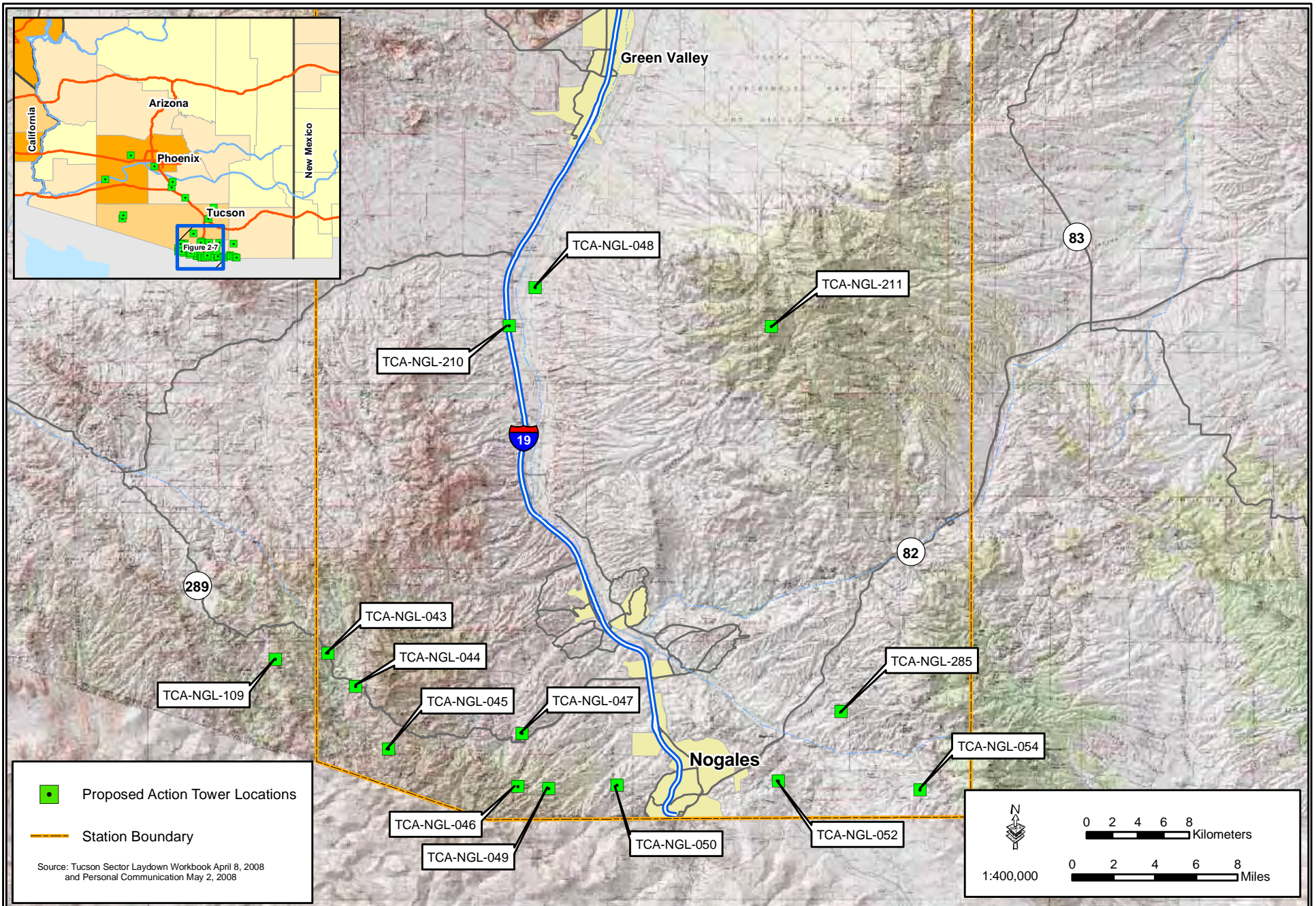


Figure 2-6: Nogales AO Proposed Towers

Tower ID: TCA-NGL-044
Type of Tower: RRVS
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Undeveloped
Location Description: The proposed tower site for TCA-NGL-044 is approximately 18.5 miles west of Nogales, Arizona (see Figure 2-6).
Tower Access: Access to the site is from the existing access road, Ruby Road or SR 289. New access road construction (274 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-045
Type of Tower: RRVS
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Undeveloped
Location Description: The proposed tower site for TCA-NGL-045 is approximately 16 miles west of Nogales, Arizona (see Figure 2-6).
Tower Access: Access to the site is from an existing access road, Summit Motor Way. New access road construction (409 feet) and the installation of a gate at an existing fence would be required to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-046
Type of Tower: RRVs
Tower Foundation: SST
Tower Height: Approximately 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Disturbed old tower
Location Description: The proposed tower site for TCA-NGL-046 is approximately 10 miles west of Nogales, Arizona (see Figure 2-6).
Tower Access: Access road repair (1,486 feet) and a very small amount of new road (14 feet) would be needed to facilitate tower installation and maintenance. Additionally, 85 cubic yards of fill would be needed for site grading which are obtained on-site or on CNF at a site identified by land management plans and personnel.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-047
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Undeveloped
Location Description: The proposed tower site for TCA-NGL-047 is approximately 6.4 miles west of the town of Nogales, Arizona (see Figure 2-6).
Tower Access: Access to the site is from an existing USFS road off of Ruby Road or SR 289. Access road repair (3,803 feet) would be needed to facilitate tower installation and maintenance. Three hundred cubic yards of fill would be needed for site grading which are obtained on-site or on the CNF at a site identified by and agreed to be CNF land management plans and personnel.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-048
Type of Tower: RRVs-CRT
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: Privately-owned land, undeveloped and used as open rangeland for cattle grazing.
Location Description: The site is approximately 24 miles north of Nogales, Arizona and 1.25 miles east of Interstate 19 (see Figure 2-6).
Tower Access: The current access road would not require any repair, or improvements.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-049
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Rangeland
Location Description: The proposed tower site for TCA-NGL-049 is approximately 7 miles southwest to the intersection of Interstate 19 (I-19 business route) and Country Club Drive near the outskirts of Nogales, Arizona (see Figure 2-6).
Tower Access: Access road repair (3,035 feet) and a small amount of new road construction (88 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-050
Type of Tower: RRVS
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF
Location Description: The proposed tower site for TCA-NGL-050 is approximately 3.5 miles west of the intersection of I-19 and Mariposa Road Interchange near the outskirts of Nogales, Arizona (see Figure 2-6).
Tower Access: Access to the site is from an existing USFS road, FSR 4213, directly off of Mariposa Ranch Road. Access road repair (1,476 feet) and a small amount of new road construction (37 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-052
Type of Tower: RRVS
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: Privately-owned land
Location Description: The proposed tower site for TCA-NGL-052 is approximately 4 miles east northeast of Nogales, Arizona (see Figure 2-6).
Tower Access: Access to the site is on an existing access road directly off of North Royal Road. The current access road does not require any improvements, although a small amount of new road construction (68 feet) would be needed.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-054
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF - Undeveloped
Location Description: The proposed tower site for TCA-NGL-054 is approximately 9.5 miles east of Nogales, Arizona (see Figure 2-6).
Tower Access: The existing access road is FSR 20 directly off of Duquesne Road and in places the access road slope exceeds 20 percent. Access road repair (8,285 feet) and a small amount of new road construction (185 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-109
Type of Tower: CRT
Tower Foundation: RB
Tower Height: Approximately 30 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF land - Disturbed
Location Description: The proposed tower site is approximately 18 miles northwest of Nogales, Arizona (see Figure 2-6).
Tower Access: This particular design is intended for use in areas which are inaccessible and need an alternative transportation method for installation. The proposed tower, TCA-NGL-109 is currently planned to be installed via helicopter airlift.
Type of Primary Power: Power to the tower will be provided by four solar panels and a wind turbine.

Tower ID: TCA-NGL-210
Type of Tower: CRT
Tower Foundation: SST
Tower Height: Approximately 100 feet
Station: Nogales
Location: Santa Cruz County
Land Use: ADOT land - Disturbed
Location Description: The proposed tower site for TCA-NGL-210 is approximately 25 miles north of Nogales, Arizona area at the I-19 CBP Checkpoint between the I-19 exit from Nogales and East Frontage Road (see Figure 2-6).
Tower Access: A small amount of new road construction (78 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-NGL-211
Type of Tower: CRT
Tower Foundation: SST
Tower Height: Approximately 100 feet
Station: Nogales
Location: Santa Cruz County
Land Use: CNF
Location Description: The proposed tower site for TCA-NGL-211 is approximately 10 miles east of the community of Amado (see Figure 2-6); near an existing tower site.
Tower Access: A small amount of new road construction (132 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID:	TCA-NGL-285
Type of Tower:	RRVS
Tower Foundation:	RDT
Tower Height:	Up to 120 feet
Station:	Nogales
Location:	Santa Cruz County
Land Use:	Privately-owned land
Location Description:	The proposed tower site for TCA-NGL-285 is on CNF within the Patagonia Mountains and is approximately 1.5 miles northwest of the Nogales International Airport within Santa Cruz County (see Figure 2-6); near an existing tower site.
Tower Access:	Approximately, 22 feet of new approved road construction, along with the installation of one gate would need to occur to facilitate tower installation and maintenance.
Type of Primary Power:	Accessible to nearby commercial grid power (within 3 miles).

2.3.4 Sonoita AOR Proposed Tower Descriptions

Tower ID:	TCA-SON-055
Type of Tower:	RRVS
Tower Foundation:	RDT
Tower Height:	Up to 120 feet
Station:	Sonoita
Location:	Santa Cruz County
Land Use:	Privately-owned land - Undeveloped
Location Description:	The tower site for TCA-SON-055 is approximately 22 miles south of the intersection of SR 82 and 83 in Sonoita, Arizona within the CNF (Figure 2-7).
Tower Access:	Access to the tower is from FSR 7015 via several FSRs (128, 61, 813, and 58) and Harshaw Road. Road repair to FSR 7015 would be needed (4,014 feet) and new access road construction (286 feet) would be required to facilitate tower installation and maintenance. A gate would be required for security purposes.
Type of Primary Power:	Generator-solar hybrid

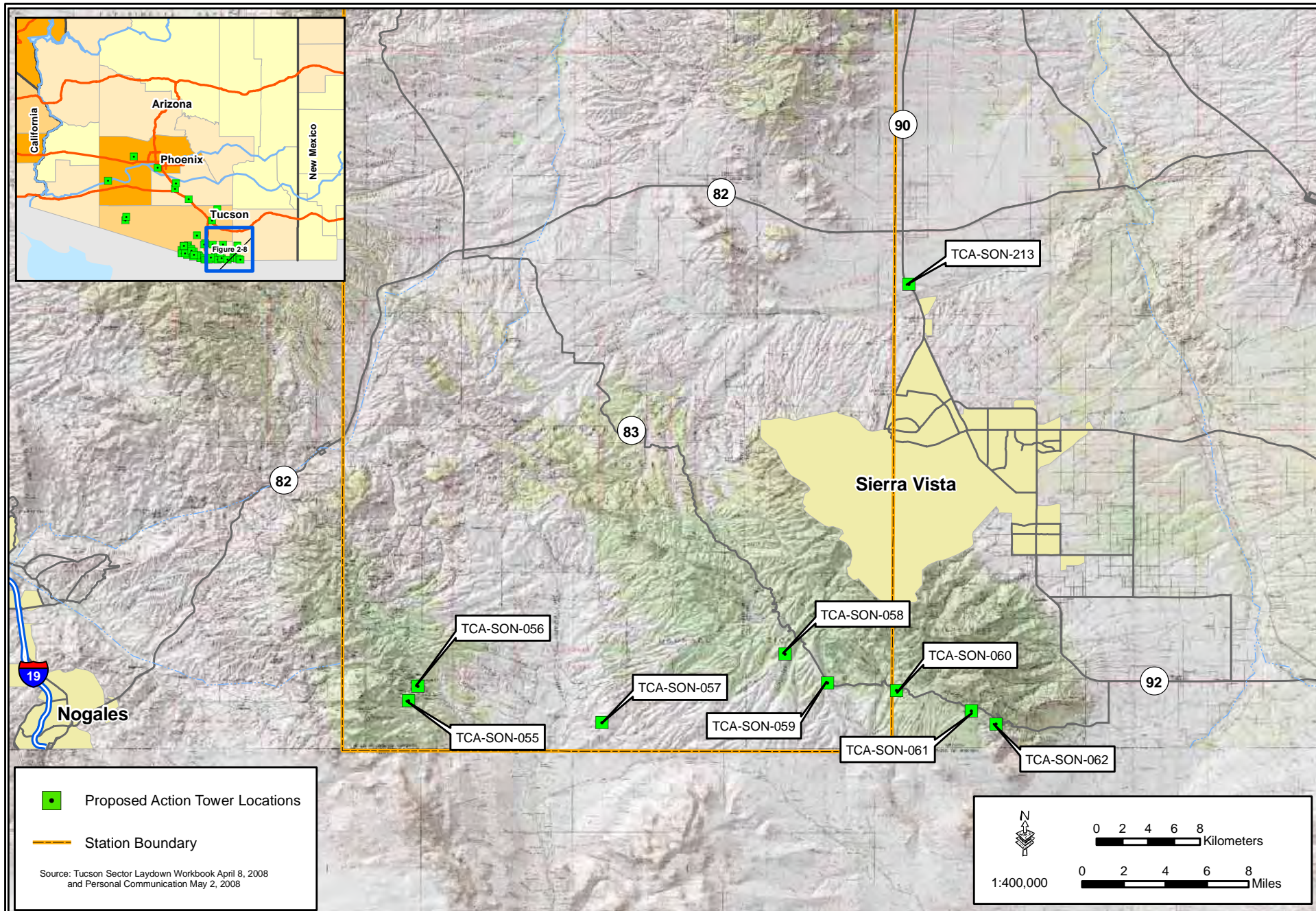


Figure 2-7: Sonoita AO Proposed Towers

Tower ID: TCA-SON-056
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Santa Cruz County
Land Use: CNF - Privately leased
Location Description: Access to the tower is from FSR 4911 via several USFS access roads (FSR 58, 813, and 61) and Harshaw Road (see Figure 2-7).
Tower Access: The current access road (FSR 4911) would not require any repair or improvements.
Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

Tower ID: TCA-SON-057
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Santa Cruz County
Land Use: CNF
Location Description: The proposed tower site for TCA-SON-057 is approximately 23 miles south of the intersection of SR 82 and 83 near Sonoita, Arizona (see Figure 2-7).
Tower Access: Access to the tower is from an un-named existing access road via several USFS access roads (FSR 61, 813, and 58) and Harshaw Road. Repair to the un-named road (3,656 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-058
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Cochise County
Land Use: CNF - Privately leased
Location Description: The proposed tower site for TCA-SON-058 is approximately 23 miles south of the intersection of SR 82 and 83 near Sonoita, Arizona (see Figure 2-7).
Tower Access: Access to the tower is from FSR 227 via several USFS access roads (FSR61, 813, and 58) and Harshaw Road. Additionally, approximately 106 feet of new access road with a gate and a cattle guard would be required to facilitate access to the proposed tower.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-059
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Cochise County
Land Use: CNF - Privately leased
Location Description: The proposed tower site for TCA-SON-059 is approximately 26 miles south of the intersection of SR 82 and 83 (see Figure 2-7).
Tower Access: Access to the tower is from FSR 61 via several USFS access roads (FSR 813 and 58) and Harshaw Road. New access road construction from FSR 61 (225 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-060
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Cochise County
Land Use: CNF
Location Description: The proposed tower site for TCA-SON-060 is approximately 28 miles south of the intersection of SR 82 and 83 near Sonoita, Arizona (see Figure 2-7).
Tower Access: Access to the tower is from FSR 61 via several USFS access roads (FSR 813 and 58) and Harshaw Road. The existing access road (FSR 61) to the tower becomes narrow and winding as it traverses Montezuma Pass. Some road repair to FSR 61 (200 feet) would be required to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-061
Type of Tower: RRVs
Tower Foundation: RDT
Tower Height: Up to 120 feet
Station: Sonoita
Location: Cochise County
Land Use: CNF
Location Description: The proposed tower site for TCA-SON-061 is approximately 30 miles south of the intersection of SR 82 and 83 near Sonoita, Arizona (see Figure 2-7).
Tower Access: Access to the tower is from FSR 4781 via several USFS access roads (FSR 61, 813 and 58) and Harshaw Road. The existing access road (FSR 4781) to the tower becomes narrow and winding as it traverses Montezuma Pass. A small amount of new access road construction (95 feet) would be needed to facilitate tower installation and maintenance.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-062
Type of Tower: RRV5-CRT
Tower Foundation: SST
Tower Height: Up to 120 feet
Station: Sonoita
Location: Cochise County
Land Use: Coronado National Memorial - Park Services Land overlook
Location Description: The proposed tower site for TCA-SON-062 is approximately 32 miles south of the intersection of SR 82 and 83 near Sonoita, Arizona (see Figure 2-7).
Tower Access: Approach to the Montezuma Pass Overlook is from FSR 61 via several USFS access roads (FSR 813 and 58) and Harshaw Road. The current access road does not require any repair or improvements.
Type of Primary Power: Generator-solar hybrid

Tower ID: TCA-SON-213
Type of Tower: CRT
Tower Foundation: SST
Tower Height: 200 feet 6 inches
Station: Sonoita
Location: Cochise County
Land Use: Privately-owned land
Location Description: The proposed tower site for TCA-SON-213 is approximately 7.5 miles north of Sierra Vista, Arizona (see Figure 2-7).
Tower Access: New access road construction (491 feet) would be needed to facilitate tower installation and maintenance. One drainage culvert would be installed at the entrance road.
Type of Primary Power: Accessible to nearby commercial grid power (within 3 miles).

2.3.5 Existing or Proposed Towers Planned for Upgrades

Eleven existing towers currently have communications hardware arrays which would be upgraded or retrofit based on the Tucson West project COP. These towers are located at CBP facilities or commercial properties that have been previously developed. Only

one P25 tower location would require any additional ground disturbance or change in the footprint and operational activities at the tower site. As mentioned above, TCA-CAG-195 would require repair to its access road. Upgrades of the 11 existing towers would consist of installing communications and sensor hardware on the existing towers (Figure 2-8). Additionally, TCA-AJO-305 would be a new tower constructed at the new Ajo Station to replace the existing communication tower at the old Ajo Station (see Figure 2-8). This tower was addressed in the 2007 EA prepared for the proposed construction of the new station entitled *Environmental Assessment for the Ajo Border Patrol Station Expansion, Office of Border Patrol, Tucson Sector, Arizona, Why Arizona* (CBP 2007b).

2.4 NO ACTION ALTERNATIVE

The No Action Alternative describes future circumstances if the proposed communications and sensor tower installation does not take place, and can be characterized as the continuation of current practices and procedures. While the No Action Alternative does not satisfy the stated purpose and need, its inclusion in this EA is required by NEPA regulations as a basis of comparison to the anticipated effects of the Proposed Action.

2.5 ALTERNATIVES ELIMINATED FROM ANALYSIS

Several project elements that included other technology and infrastructure considerations such as unmanned aircraft systems (UAS) and imaging satellites were considered as alternatives to this Proposed Action, but were eliminated from further review. Although these alternatives or a combination of these alternatives can be valuable tools which CBP may employ in other instances, they were eliminated because of logistical restrictions, environmental considerations, and/or functional deficiencies that would fail to meet the purpose and need for this project. These alternatives and reasons for their exclusion from further analysis are discussed below.

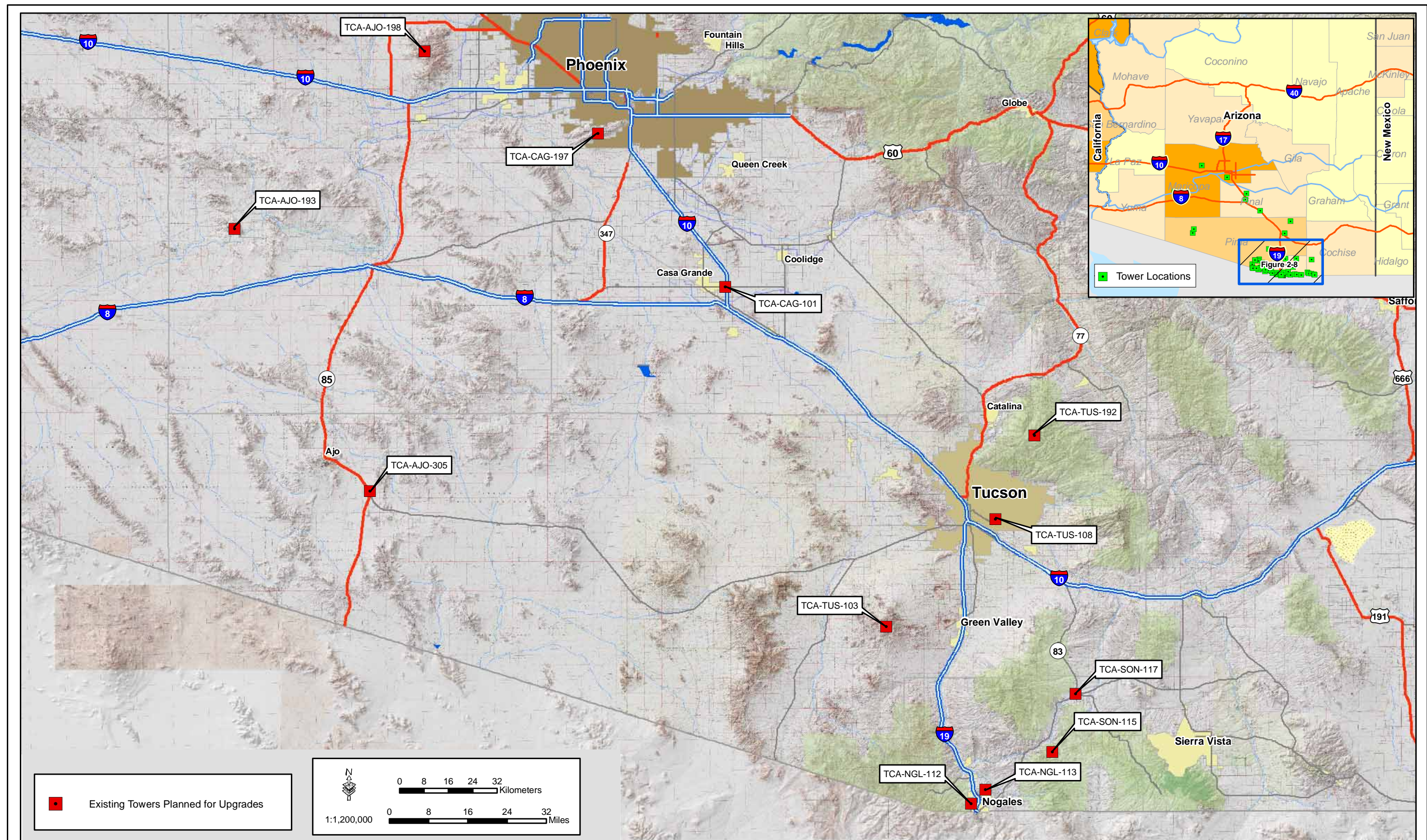


Figure 2-8: Towers Planned For Upgrades

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2.5.1 Unmanned Aircraft Systems (UAS)

As a stand-alone alternative, the use of UASs in lieu of towers was not further evaluated for feasibility or potential impacts because they present an unacceptable level of reliability and would require extraordinary design, operation, and maintenance considerations that would fail to achieve the goals of *SBI_{net}*, and enhanced surveillance and protection of the U.S.-Mexico border. Additionally, the use of UASs would not provide 24 hours per day coverage.

2.5.2 Remote Sensing Satellites

Use of remote sensing satellites was not further evaluated for feasibility or potential impacts because they present an unacceptable level of reliability and would present extraordinary design, operation, and maintenance considerations that would fail to achieve the goals of *SBI_{net}*, and enhanced surveillance and protection of the U.S.-Mexico border. Remote sensing satellites would not provide full-time coverage or acceptable visual resolution of the border areas under consideration for this project. Additionally, immediate data-sharing requirements could not be met with satellite imagery.

2.5.3 Unattended Ground Sensors (UGS)

Another alternative that was considered, but eliminated from further evaluation involved UGS fields only. The expanse of area required for UGS fields to effectively cover a similar area that a single tower surveillance system provides, would have been too wide-spread. Also, since each UGS needs to be buried and periodically relocated, the environmental damage would be too great to be further considered as a reasonable alternative. Additionally, the number of UGSs needed and their battery replacement rate would be too extensive and generate an unnecessarily large volume of spent waste batteries and further consume extensive CBP agent labor hours in UGS relocation and battery replacement. As mentioned previously, UGS will be deployed, as they currently are, in disturbed sites within high traffic areas. However, the use of UGS in this manner, is vastly different than a matrix/field deployment approach described above.

2.5.4 Increased CBP Workforce Alternative

Another alternative considered during the preparation of this EA was to have no towers, but instead, to simply increase the number of CBP agents to patrol (via vehicles) the areas that a tower communication and sensor system would cover. The sites selected for tower installation are considered high intensity areas for illegal entries. Thus, an alternative to the tower system would be to station additional CBP agents at each of these sites to observe activities and detect any potential cross border violations. CBP agents would have to be stationed at these sites 24-hours per day, 7 days a week, and due to local topography and vegetation, would not provide the same level of detection capabilities as the tower systems. Consequently, additional observation points would have to be established to provide the same coverage as the proposed tower systems, which would disturb additional areas along the border. Such efforts would require an enormous commitment of human resources and would require an increase of 72 agents per 8-hour shift (assuming it would require approximately six agents to monitor an area equal to what one tower system could monitor) to obtain an equal level of effectiveness. Agents would be assigned to these observation points and would provide minimal additional strength to the stations' apprehension capabilities. Additionally, new facilities would have to be constructed to accommodate the number of additional staff needed to patrol a given tower coverage area. The human resource and vehicular maintenance, coupled with the resulting depletion of resources, represented too great an environmental impact to be further considered as a reasonable alternative.

2.5.5 Increased Aerial Reconnaissance/Operations

Under this alternative, increased aerial reconnaissance would be used for surveillance in support of the stations. CBP would use fixed-wing aircraft and helicopters to perform reconnaissance and detection operations as well as to support ground patrols.

This alternative was eliminated from further consideration because it does not satisfy the purpose and need of the project. The purpose and need calls for a 24-hour, all-weather system for detection of illegal activities. Aerial reconnaissance/operations require highly skilled pilots, cannot be used on a 24-hour per day basis, and cannot

operate under all weather conditions. Aerial reconnaissance/operations also have limited detection capabilities in areas such as deep ravines, at night-time, and in thick vegetation.

Aerial reconnaissance/operations are also limited over or near military installations, National parks and monuments, wilderness areas, and near commercial airports. The FAA and/or the Department of Defense impose flight restrictions on CBP operations missions over or near their facilities. Aerial reconnaissance/operations have also restricted flight patterns near endangered species or other sensitive wildlife habitats, at night-time, and over Indian reservations or other sacred cultural sites.

Aerial reconnaissance/operations have proven to be an effective border enforcement strategy in some regions of the border. For example, aerial operations have proven highly effective in areas where the open terrain, low growing vegetation, and sandy soils allow ICs and signs of other illegal border traffic to be easily recognized from aircraft. Additionally, aerial reconnaissance/operations have become invaluable to CBP agents for performing search and rescue missions and during vehicle pursuits. Due to their effectiveness in given situations and specific areas of the border, increasing aerial reconnaissance/operations may be an effective solution in other areas or to meet the purpose and need of other DHS activities. However, aerial reconnaissance as a stand alone alternative does not satisfy the current purpose and need as stated herein, and thus, for this assessment, it was eliminated from further consideration.

2.6 SUMMARY

The two alternatives selected for further analysis are the No Action Alternative and the Proposed Action. An alternative matrix (Table 2-3) shows how each of these alternatives satisfies the stated purpose and need. Table 2-4 presents a summary matrix of the impacts from the two alternatives analyzed and how they affect the environment and environmental resources in the tower areas.

Table 2-3. Alternative Matrix of Purpose and Need to Alternatives

Purpose and Need	No Action Alternative	Proposed Action
Installing and upgrading technology and infrastructure components to give CBP agents ability to gain, maintain, and strengthen control of the border within proximity of the international;	No	Yes
Including improved surveillance technology solutions to enhance border enforcement capabilities;	No	Yes
Applying surveillance technologies that would refine detection, interception, and apprehension of undocumented aliens, smugglers, and terrorists;	No	Yes
Reducing crime in border communities by detecting, apprehending, and deterring smugglers of humans, drugs, and other contraband.	Partial*	Yes

* The No Action Alternative would still partially meet the purpose and need of reducing crime due to the continued use of CBP agents in the field.

Table 2-4. Summary Matrix

Affected Environment	No Action Alternative	Proposed Action
Land Use (Section 3.2)	No construction of towers and roads would occur so no direct impacts would occur. Illegal traffic would continue to impact and disturb existing land uses within the station AORs.	The Proposed Action would temporarily impact approximately 73 acres and permanently impact approximately 41 acres of rangeland, agricultural, and state and Federal land to CBP enforcement land use. Implementation of the Proposed Action would protect existing land uses from continued and potentially increasing disruption by IC traffic, providing a beneficial impact relative to the No Action Alternative.
Geology and Soils (Section 3.3)	No construction of towers and roads would occur so no direct impacts on geologic or soil resources would occur. Illegal traffic would continue to impact and disturb soils within the station AORs.	Under the Proposed Action, geology would not be significantly impacted by the construction of towers and access roads. Approximately 41 acres of soils would be permanently impacted; although these impacts are long term they would be minor as compared to large amounts of these soils regionally. Additionally, there would be no impacts on prime farmland.
Hydrology and Groundwater (Section 3.4)	The No Action Alternative would have no impacts on surface or groundwater availability.	The Proposed Action would not significantly alter natural drainage patterns. Groundwater usage for construction of the towers would be approximately 554,000 gallons for the construction of new access roads and 325,841 gallons for the improvement of existing access roads. The basins in and around these areas are overtaxed so even minimal usage would add to the water deficit. Therefore, any water required for construction activities within the upper San Pedro Basin, (TCA-SON-231), would need to be trucked in from other nearby groundwater basins to avoid adverse impacts. Groundwater use from all other regional basins would be insignificant when compared to overall regional use.
Surface Waters and Waters of the U.S. (Section 3.5)	No construction of towers and roads would occur so no direct impacts would occur.	Short term temporary effects would occur during the proposed construction activities. A total of 37 potential Waters of the U.S. (WUS) would be impacted by the construction of new access roads, repair, or improvements. Construction and roadwork activities within these washes is authorized under a Nationwide Permit 14. No potential jurisdictional wetlands were observed at the proposed tower sites or within the footprint of existing approach and access roads or the proposed footprint of any new roads.
Floodplains (Section 3.6)	The No Action Alternative would have no impacts on the 100-year flood zone.	The Proposed Action would not cause direct impacts to jurisdictional floodplains by new and improved access roads. Additionally, no proposed tower sites are located within the 100-year flood zone.

Table 2-4, continued

Affected Environment	No Action Alternative	Proposed Action
Vegetative Habitat (Section 3.7)	No construction of towers and roads would occur so no direct impacts would occur. However, IC activity damages vegetation, promotes the dispersal and establishment of invasive species, and can result in catastrophic wildfires.	Under the Proposed Action, a total of 41 acres of vegetative habitat would be removed and includes; 2 acres of Sonoran Desertscrub (Arizona Upland and Lower Colorado River Subdivisions); 2.5 acres of Plains Grassland; 21 acres of Semidesert Grasslands; 1 acre of Chihuahuan Desert Scrub; and 15 acres of Madrean Evergreen Woodland. Additionally, 73 acres would be temporarily impacted within these same communities. The Proposed Action would result in indirect benefits to project area vegetation communities through the reduction of IC activity.
Wildlife and Aquatic Resources (Section 3.8)	Under the No Action Alternative, no direct impacts to wildlife habitats would occur. However, IC activity would continue to impact vegetation communities resulting in the degradation of wildlife habitat.	The Proposed Action would cause the permanent loss and degradation of 41 acres of wildlife habitat. No sensitive or rare wildlife species would be directly impacted; however, sedentary animals could be lost during construction activities. Mitigation measures would ensure there would be no significant impacts on birds. Several of the proposed tower sites are void of vegetation as a result of previous impacts, while many others have been impacted by cattle grazing. However, there would be indirect beneficial impacts on wildlife by reducing the adverse impacts of IC activity.
Protected Species and Critical Habitat (Section 3.9)	No construction of towers and roads would occur so no direct impacts would occur. However, the impacts of IC activity on habitats throughout the project area would continue to threaten endangered species and their habitats.	Under the Proposed Action, a total of 41 acres of potential habitat would be lost. Fourteen protected species may be potentially affected by the Proposed Action but not likely to affect. Additionally, 10 proposed tower sites and associated access roads are within the critical habitat for the Mexican spotted owl. The Proposed Action may affect and is likely to adversely affect the Mexican spotted owl and its critical habitat, Chiricahua leopard frog, jaguar, lesser long nose bat and Pima pineapple cactus. Consultation with USFWS is completed.
Cultural Resources (Section 3.10)	Under the No Action Alternative, no direct impacts to cultural resources would occur. However, IC traffic would continue to impact cultural resources within the area.	Under the Proposed Action two newly recorded NRHP-eligible sites would be adversely impacted, an additional four previously recorded sights would not be adversely impacted due to mitigation measures. The creation and employment of a site testing plan along with avoidance assurance measures would ensure data recovery or avoidance. Potential, unidentified cultural resource sites located within the study area and regionally would receive increased protection from disturbance by IC traffic.
Air Quality (Section 3.11)	No construction of towers and roads would occur so no direct impacts would occur.	Under the Proposed Action, temporary and minor increases in air pollution would occur during construction activities. However, air quality emissions resulting from the Proposed Action do not exceed <i>de minimis</i> thresholds for National Ambient Air Quality Standards pollutants. Therefore, a general conformity analysis would not be required for the Proposed Action.

Table 2-4, continued

Affected Environment	No Action Alternative	Proposed Action
Noise (Section 3.12)	Under the No Action Alternative, the noise receptors near the tower installations would not experience additional noise events; however, they would continue to experience ambient noise disturbances in from trains, trucks, and cars traveling in the area.	Under the Proposed Action, noise emissions are expected to be minor and short term in duration.
Radio Frequency Environment (Section 3.13)	Under the No Action Alternative, no direct impacts on humans, wildlife or communications would occur.	Radio and microwave transmissions associated with the operation of the proposed towers would not have a significant adverse impact on humans, wildlife, or other communication systems. All transmitters and sensors associated with this project would operate below 30 gigahertz. Compliance and coordination with National Telecommunications and Information Administration (NTIA) and Federal Communications Commission (FCC) regulations and guidelines would ensure there would be no significant adverse impacts to observatories, human safety, or the natural and biological environment.
Utilities and Infrastructure (Section 3.14)	No construction of towers and roads would occur so no direct impacts on utilities and infrastructure would occur. Ambient lighting conditions would continue to be problematic near large urban areas such as Tucson.	The Proposed Action would cause negligible demands to local power grids, when assessed against electrical power consumption from the overall regional power grids. With implementation of the Proposed Actions, lights would be shielded and follow Pima County light ordinances to the greatest extent possible. Therefore, using these measures no significant long term impact to the night sky and ambient lighting would occur.
Roadways and Traffic (Section 3.15)	No construction of towers and roads would occur so no direct impacts would occur.	Under the Proposed Action, construction and staging for the access roads, foundations, and towers would create minor short term impacts to roadways and traffic within the project corridor. However, traffic patterns would return to normal conditions upon completion of construction.

Table 2-4, continued

Affected Environment	No Action Alternative	Proposed Action
Aesthetics (Section 3.16)	Under the No Action Alternative, no direct impacts on aesthetics would occur. However, IC traffic would continue to degrade overall aesthetics within the area.	The installation of communication and sensor towers would detract from the aesthetic resources of the proposed corridor. However, most of these infrastructure components would be located within rangeland areas and near existing stations and within fairly rural and remote areas. Being a common visual feature upon U.S. landscapes, especially along major transportation routes, and given their distances from each other, the visual impacts would be minimal. However, one tower site is located on the Coronado National Memorial (CNM) and there would be minor to moderate impacts to aesthetic and visual resources. This impact is higher than others in the area; therefore, CBP would coordinate with the NPS to minimize these impacts to the extent practicable. Most of the new access road work is very near the proposed tower sites and near existing access roads; therefore the visual and aesthetic impacts from road work would be minor. Overall impacts on the aesthetic quality of the area would be less than significant.
Hazardous Waste (Section 3.17)	Under the No Action Alternative, no direct impacts on solid and hazardous waste would occur. However, IC traffic would continue to impact cultural resources within the area.	The Proposed Action would not result in a significant exposure of the environment or public to any hazardous materials. However, the potential exists for petroleum, oil, and lubricants (POL) contamination during construction or operational activities. Best management practices would be put in place to minimize any potential contamination at the proposed sites during construction activities and operation.
Socioeconomics (Section 3.18)	Under the No Action Alternative, no direct impacts on socioeconomics would occur.	The Proposed Action would not cause any changes to local employment rates, poverty levels, or local incomes. Long term beneficial, socioeconomic impacts could be realized from the purchasing of propane.
Environmental Justice (Section 3.19)	Under the No Action Alternative, no direct impacts on environmental justice would occur.	Implementation of the Proposed Action would cause no direct impacts on environmental justice concerns.
Sustainability and Greening (Section 3.20)	No construction of towers and roads would occur so no direct impacts would occur.	Under the Proposed Action, applicable Federal sustainability and greening practices would be implemented to the greatest extent practicable.

SECTION 3.0
AFFECTED ENVIRONMENT AND CONSEQUENCES

3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

3.1 PRELIMINARY IMPACT SCOPING

This section of the EA describes the natural and human environment that exists within the project corridor and Region of Influence (ROI); and the potential impacts of the No Action and Proposed Action as outlined in Section 2.0 of this document. The ROI for the tower project is Maricopa, Pima, Santa Cruz, Pinal and Cochise counties, Arizona. Only those parameters with the potential to be affected by the Proposed Action are described, per CEQ regulations (40 CFR 1501.7 [3]). Impacts can vary in magnitude from a slight to a total change in the environment. The impact analysis presented in this EA is based upon existing regulatory standards, scientific and environmental knowledge and best professional opinions. The impacts on each resource are described as significant, moderate, minor (minimal), insignificant or no impact. Some topics are limited in scope due to the lack of direct effect from the proposed project on the resource, or because that particular resource is not located within the project corridor. Resources such as climate and wild and scenic rivers are not addressed for the following reasons:

- Climate
The climate would not be impacted by the construction and operation of the Proposed Action.
- Wild and Scenic Rivers
The Proposed Action would not affect any designated Wild and Scenic Rivers (16 U.S.C. 551, 1278[c], 1281[d]) because no rivers designated as such are located within or near the study corridor.

Impacts (consequence or effect) can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action. Direct impacts are those effects that are caused by the action and occur at the same time and place (40 CFR 1508.8[a]). Indirect impacts are those effects that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8[b]). As discussed in this section, the No Action and Proposed Action may create

temporary (lasting the duration of the project), short term (up to 3 years), long term (3 to 10 years following construction), or permanent impacts or effects.

Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. Significant impacts are those effects that would result in substantial changes to the environment (40 CFR 1508.27) and should receive the greatest attention in the decision-making process. Insignificant impacts are those that would result in minimal changes to the environment. The following discussions describe and, where possible, quantify the potential effects of each alternative on the resources within or near the project area. All impacts described below are considered to be adverse unless stated otherwise.

Table 3-1 presents the permanent and temporary (construction) impacts for the construction of proposed towers, improved access roads, and new access roads. Figure 3-1 illustrates how these impacts would occur or were calculated. Additionally, three main storage areas as well as smaller individual staging areas at each proposed tower site would be utilized for tower and associated access road work. The three main storage areas are all located at existing private and Federal properties which have been previously disturbed and either currently serves as warehouse facilities, maintenance facilities, and/or parking/laydown areas. As such these areas will not have further environmental consequences to the human or natural resources and will not be further analyzed in this EA.

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 would be maintained as a fire buffer. The fire buffer would be maintained free of vegetation. This fire buffer is fully analyzed in the EA and is shown in Table 3-1 under the permanent tower impacts as the same value as the temporary tower impacts.

Table 3-1. Temporary and Permanent Impacts from the Proposed Action

Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)	Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)
Casa Grande Station AO Towers					
TCA-CAG-102	0.23	0.23	TCA-CAG-195	0.23	0.23
Access Road	0.00	0.00	Access Road	3.28	1.31
Subtotal	0.23	0.23	Subtotal	3.51	1.54
Tuscon Station AO Towers					
TCA-TUS-032	0.23	0.23	TCA-TUS-187	0.23	0.23
Access Road	0.05	0.02	Access Road	0.08	0.11
Subtotal	0.28	0.25	Subtotal	0.31	0.34
TCA-TUS-035	0.23	0.23	TCA-TUS-287	0.23	0.23
Access Road	0.04	0.05	Access Road	0.00	0.00
Subtotal	0.27	0.28	Subtotal	0.23	0.23
TCA-TUS-036	0.23	0.23	TCA-TUS-290	0.23	0.23
Access Road	0.05	0.02	Access Road	0.10	0.09
Subtotal	0.28	0.25	Subtotal	0.33	0.32
TCA-TUS-038	0.23	0.23	TCA-TUS-291	0.23	0.23
Access Road	0.02	0.03	Access Road	0.06	0.09
Subtotal	0.25	0.26	Subtotal	0.29	0.32
TCA-TUS-040	0.23	0.23	TCA-TUS-298	0.23	0.23
Access Road	13.90	6.60	Access Road	1.72	2.41
Subtotal	14.13	6.83	Subtotal	1.95	2.64
TCA-TUS-041	0.23	0.23	TCA-TUS-299	0.23	0.23
Access Road	0.12	0.05	Access Road	0.00	0.00
Subtotal	0.35	0.28	Subtotal	0.23	0.23
TCA-TUS-042	0.23	0.23	TCA-TUS-300	0.23	0.23
Access Road	5.65	2.26	Access Road	0.00	0.00
Subtotal	5.88	2.49	Subtotal	0.23	0.23
TCA-TUS-085	0.23	0.23	-	-	-
Access Road	0.79	0.35	-	-	-
Subtotal	1.02	0.58	-	-	-
TCA-TUS-181	0.23	0.23			
Access Road	8.94	3.62	-	-	-
Subtotal	9.17	3.85	-	-	-

Table 3-1, continued

Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)	Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)
TCA-TUS-185	0.23	0.23	-	-	-
Access Road	0.10	0.84	-	-	-
Subtotal	0.33	1.07	-	-	-
Nogales Station AO Towers					
TCA-NGM-043	0.23	0.23	TCA-NGL-050	0.23	0.23
Access Road	0.40	0.56	Access Road	1.39	0.59
Subtotal	0.63	0.79	Subtotal	1.62	0.82
TCA-NGL-044	0.23	0.23	TCA-NGL-052	0.23	0.23
Access Road	0.25	0.35	Access Road	0.06	0.09
Subtotal	0.48	0.58	Subtotal	0.29	0.32
TCA-NGL-045	0.23	0.23	TCA-NGL-054	0.23	0.23
Access Road	0.38	0.53	Access Road	7.78	3.28
Subtotal	0.61	0.76	Subtotal	8.01	3.51
TCA-NGL-046	0.23	0.23	TCA-NGL-109	0.23	0.23
Access Road	1.38	0.56	Access Road	0.00	0.00
Subtotal	1.61	0.79	Subtotal	0.23	0.23
TCA-NGL-047	0.23	0.23	TCA-NGL-210	0.23	0.23
Access Road	3.49	0.23	Access Road	0.07	0.10
Subtotal	3.72	0.46	Subtotal	0.30	0.33
TCA-NGL-048	0.23	0.23	TCA-NGL-211	0.23	0.23
Access Road	0.00	0.00	Access Road	0.12	0.17
Subtotal	0.23	0.23	Subtotal	0.35	0.40
TCA-NGL-049	0.23	0.23	TCA-NGL-285	0.23	0.23
Access Road	2.87	1.23	Access Road	0.02	0.03
Subtotal	3.10	1.46	Subtotal	0.25	0.26
Sonoita Station AO Towers					
TCA-SON-055	0.23	0.23	TCA-SON-060	0.23	0.23
Access Road	3.95	1.84	Access Road	0.18	0.07
Subtotal	4.18	2.07	Subtotal	0.41	0.30
TCA-SON-056	0.23	0.23	TCA-SON-061	0.23	0.23
Access Road	0.00	0.00	Access Road	0.09	0.12
Subtotal	0.23	0.23	Subtotal	0.32	0.35
TCA-SON-057	0.23	0.23	TCA-SON-062	0.23	0.23
Access Road	3.36	1.34	Access Road	0.00	0.00
Subtotal	3.59	1.57	Subtotal	0.23	0.23

Table 3-1, continued

Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)	Tower ID	Temporary Impacts (in acres)	Permanent Impacts (in acres)
TCA-SON-058	0.23	0.23	TCA-SON-213	0.23	0.23
Access Road	0.10	0.14	Access Road	0.45	0.63
Subtotal	0.33	0.37	Subtotal	0.68	0.86
TCA-SON-059	0.23	0.23	-	-	-
Access Road	0.21	0.29	-	-	-
Subtotal	0.44	0.52	-	-	-
Total Impacts to All Tucson				Temporary:	73.23
Sector Stations (in area)				Permanent:	41.11

Note: Includes previously disturbed areas

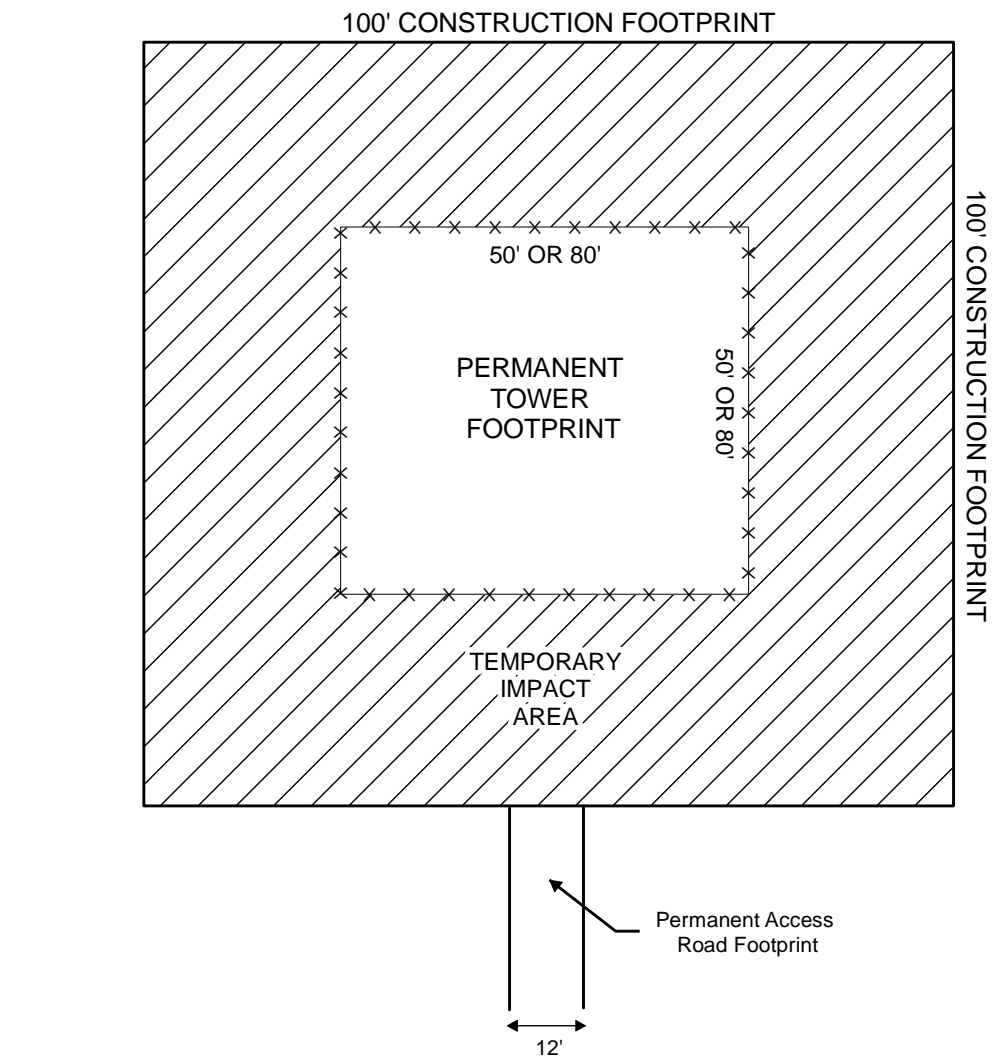
3.2 LAND USE

3.2.1 Affected Environment

Maricopa County covers 9,222 square miles in southwestern Arizona (Arizona Department of Commerce [AZDC] 2008a). Mostly desert, land use is dependent upon soil characteristics and water availability. Government, tourism, and commercial business are the county's principal land uses.

On the southwestern border of Arizona, lies Pima County which covers 9,184 square miles (AZDC 2008b). Government, tourism, commercial, and Indian reservations are the county's principal land uses. The land use in the mostly desert region of Pima County is dependent upon soil characteristics and water availability.

Cochise County covers 6,219 square miles in southwestern Arizona (AZDC 2008c). Mostly desert, land use is dependent upon soil characteristics and water availability. Government (including military), agriculture, grazing land, and commercial, are the county's principal land uses. Cochise County is one of three counties in Arizona that does not have an Indian reservation.



NOT TO SCALE

Figure 3-1: Typical Tower Impact Footprint



Pinal County encompasses 5,374 square miles in southwestern Arizona (AZDC 2008d). Government, agriculture, commercial, and Indian reservations are the county's principal land uses. Mostly desert, land use is dependent upon soil characteristics and water availability.

Santa Cruz County can also be found on the southwestern border of Arizona and covers 1,236 square miles (AZDC 2008e). Land use in this desert region is generally dependant upon soil characteristics and water availability. Government, tourism, and commercial are the county's principal land uses.

Land ownership distribution within the ROI is shown in Table 3-2.

Table 3-2. Land Ownership Distribution by County

County	Entity (percentage)					
	BLM	USFS	Indian Reservations	State of Arizona	Private	Other Public Lands
Maricopa	28	11	5	11	29	16
Pima	12.1		42.1	14.9	13.8	17.1
Cochise	22		0	35	40	3
Pinal	14		23	35	22	6
Santa Cruz	54.6		0	7.8	37.5	0

Source: AADC 2008a-e

NOTE: Data available for all five counties, except Maricopa, combined BLM and USFS land ownership into one category.

The proposed tower sites are located on the Gila River Reservation, wildlife refuge, state, private, and USFS lands. CBP would obtain a special use permit, lease agreement, easement, or purchase land to install the *SBI_{net}* tower system. Table 3-3 provides a brief description of each of the proposed tower sites and nearby land use. Some proposed towers have new and improved access road work associated with the new towers, Table 3-4 indicates when access roads requiring new construction, road repair, or improvements would impact specific landowners or land managers.

Table 3-3. Proposed Tower Land Use

Tower ID	Landowner or Land Manager	Adjacent Land Use	Tower ID	Landowner or Land Manager	Adjacent Land Use
Casa Grande Station AOR Towers					
TCA-CAG-102	Private land	Near I-10 frontage; existing tower area	TCA-CAG-195	Gila Indian Reservation	Near existing commercial tower site
Tucson Station AOR Towers					
TCA-TUS-032	Pima County	Near an existing mobile tower facility; BANWR undeveloped elsewhere	TCA-TUS-185	USFS in the CNF	Undeveloped
TCA-TUS-035	BANWR	Undeveloped	TCA-TUS-187	BANWR	Undeveloped
TCA-TUS-036	USFS in the CNF	Undeveloped	TCA-TUS-287	BANWR	Undeveloped with some residential
TCA-TUS-038	USFS in the CNF	Undeveloped	TCA-TUS-290	Privately owned land	Residential and grazing land
TCA-TUS-040	USFS in the CNF	Undeveloped	TCA-TUS-291	CBP	Undeveloped but on an existing CBP facility (Sasabe POE)
TCA-TUS-041	USFS in the CNF	Cattle grazing	TCA-TUS-298	USFS in the CNF	Undeveloped
TCA-TUS-042	USFS in the CNF	Undeveloped	TCA-TUS-299	BANWR	Undeveloped
TCA-TUS-085	BANWR in Pima County	Undeveloped	TCA-TUS-300	Pima County	Undeveloped BANWR but at an existing tower site
TCA-TUS-181	USFS in the CNF	Undeveloped	-	-	-
Nogales Station AOR Towers					
TCA-NGL-043	USFS in the CNF	Undeveloped	TCA-NGL-050	USFS in the CNF	Mostly undeveloped; some nearby commercial development occurring
TCA-NGL-044	USFS in the CNF	Undeveloped	TCA-NGL-052	Private land	Undeveloped
TCA-NGL-045	USFS in the CNF	Undeveloped	TCA-NGL-054	USFS in the CNF	Undeveloped
TCA-NGL-046	USFS in the CNF	disturbed old radio tower site; near undeveloped land	TCA-NGL-109	USFS in the CNF	Site contains existing CBP antennae's and a helipad
TCA-NGL-047	USFS in the CNF	Undeveloped, nearby recreation areas	TCA-NGL-210	Arizona Department of Transportation; between I-19 exit ramp	Disturbed checkpoint area or agricultural
TCA-NGL-048	Private land	Existing tower facility; mix of undeveloped land, agriculture, and private with residential	TCA-NGL-211	USFS in the CNF	Near existing tower facility, nearby areas undeveloped

Table 3-3, continued

Tower ID	Landowner or Land Manager	Adjacent Land Use	Tower ID	Landowner or Land Manager	Adjacent Land Use
TCA-NGL-049	USFS in the CNF	Cattle grazing	TCA-NGL-285	Private land	Near existing tower facility, nearby areas undeveloped grazing land
Sonoita Station AOR Towers					
TCA-SON-055	Private land	Undeveloped; although, many mining shafts still exist	TCA-SON-060	USFS in the CNF	Undeveloped
TCA-SON-056	USFS in the CNF	Undeveloped	TCA-SON-061	USFS on the CNF	Undeveloped
TCA-SON-057	USFS in the CNF	Undeveloped	TCA-SON-062	CNM Park Service; paved overlook	Undeveloped
TCA-SON-058	Privately leased USFS in the CNF	Undeveloped	TCA-SON-213	Private land	Proposed industrial park site
TCA-SON-059	Privately leased USFS in the CNF	Undeveloped	-	-	-

Table 3-4. Proposed Tower Access Road Land Use

Tower ID	Landowner or Land Manager	Tower ID	Landowner or Land Manager
Casa Grande Station Tower Roads			
TCA-CAG-102	NA	TCA-CAG-195	Gila Indian Reservation
Tucson Station Tower Roads			
TCA-TUS-032	BANWR	TCA-TUS-185	USFS in the CNF
TCA-TUS-035	BANWR	TCA-TUS-187	BANWR
TCA-TUS-036	USFS in the CNF	TCA-TUS-287	BANWR
TCA-TUS-038	State, Private and USFS land	TCA-TUS-290	Arizona State Land Department (ASLD) and Private land
TCA-TUS-040	USFS in the CNF	TCA-TUS-291	CBP (Sasabe POE)
TCA-TUS-041	ASLD near the CNF	TCA-TUS-298	USFS in the CNF
TCA-TUS-042	USFS in the CNF	TCA-TUS-299	BANWR
TCA-TUS-085	BANWR	TCA-TUS-300	BANWR
TCA-TUS-181	USFS in the CNF	-	-
Nogales Station Tower Roads			
TCA-NGL-043	USFS in the CNF	TCA-NGL-050	USFS in the CNF, and Private land
TCA-NGL-044	USFS in the CNF	TCA-NGL-052	Private land
TCA-NGL-045	USFS in the CNF	TCA-NGL-054	USFS in the CNF
TCA-NGL-046	USFS in the CNF; disturbed old radio tower site	TCA-NGL-109	NA
TCA-NGL-047	USFS in the CNF	TCA-NGL-210	ADOT land
TCA-NGL-048	NA	TCA-NGL-211	USFS in the CNF
TCA-NGL-049	USFS in the CNF, and Private land	TCA-NGL-285	Private land

Table 3-4, continued

Tower ID	Landowner or Land Manager	Tower ID	Landowner or Land Manager
Sonoita Station Tower Roads			
TCA-SON-055	USFS in the CNF and Private land	TCA-SON-060	USFS in the CNF
TCA-SON-056	NA	TCA-SON-061	USFS on the CNM
TCA-SON-057	USFS in the CNF and Private land	TCA-SON-062	NA
TCA-SON-058	USFS in the CNF and Private land	TCA-SON-213	Private land
TCA-SON-059	USFS in the CNF	-	-

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, illegal traffic would continue to impact and disturb existing land uses within the project area. Due to IC pedestrian and vehicle traffic, urbanized areas and natural desert areas currently experience increased crime and damage to native vegetation, respectively. The impact of illegal activities (especially drug trafficking) within the project area, has a negative impact on residential and commercial land uses. The trampling and destruction of native vegetation from IC pedestrian and vehicular traffic would continue to have an adverse impact on the desert in the project area.

3.2.2.2 Proposed Action

Construction of the proposed towers and access roads would permanently convert approximately 41 acres from their current use to CBP enforcement activities. Table 3-5 classifies temporary and permanent impacts from towers and associated access roads according to land ownership. More than half of the proposed towers in this project would occur on or near undeveloped areas (within BANWR and CNF lands) or on rural rangeland. The proposed tower access roads is also located within these relatively undeveloped areas on existing roads or in the case of new access roads; are adjacent to existing roads.

The remaining towers and roads are in or near developed areas (*i.e.*, adjacent to the community of Amado, near the Town of Arivaca, near the City of Nogales, along

existing roads, and near the Duquesne Mine). CBP is coordinating with USFWS regarding five tower sites that are proposed for the BANWR. Construction of these five sites is contingent upon a USFWS determination that they are appropriate and compatible uses in the BANWR. Special use permits which may be necessary from certain resource agencies would be applied for prior to commencement of construction activities.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on land use. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Implementation of the Proposed Action would protect existing land uses from continued and potentially increasing disruption by IC traffic, providing a beneficial impact relative to the No Action Alternative.

Table 3-5. Proposed Tower Land Use Impact Distribution

Land Ownership	Impact (acres)	
	Temporary	Permanent
USFS	63.98	34.06
Wildlife Refuge	2.85	2.45
Indian Reservation	3.51	1.54
Private	1.78	1.99
ADOT	0.30	0.33
Park Service	0.23	0.23
Arizona State Lands	0.58	0.51
Total	73	41

3.3 GEOLOGY AND SOILS

3.3.1 Affected Environment

3.3.1.1 Geology

The project area is part of the Basin and Range Physiographic Province as delineated by the U.S. Geological Survey (USGS 2000). This province stretches from southeastern Oregon southward through Nevada and terminates south of the project area in Sonora, Mexico. Most landforms within this province are the result of tectonic and alluvial processes, and the province is characterized by low mountains and deep valleys filled with alluvium.

3.3.1.2 Soils

Soils associated with the proposed tower locations are presented in Figures 3-2a-c. There are 42 Soil Survey Geographic Database (SSURGO) soil associations listed in Table 3-6. This table provides specific information on the soils that would be impacted by each proposed tower site and access roads. The majority of the soil associations range from excessively drained to well drained. Erosion hazards for each soil association estimate the potential for soil loss or erosion due to wind or water. Soils (especially those with high erosion hazards) must rely heavily on best management practices (BMPs) as described by the Stormwater Pollution Prevention Plan (SWPPP) and in Section 5.0 of this document during construction activities to avoid significant soil loss.

Hydric soils are defined by the National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. These criteria are used to identify map unit components that normally are associated with wetlands (USDA 2006). There are no hydric soils among the soil associations within the project area.

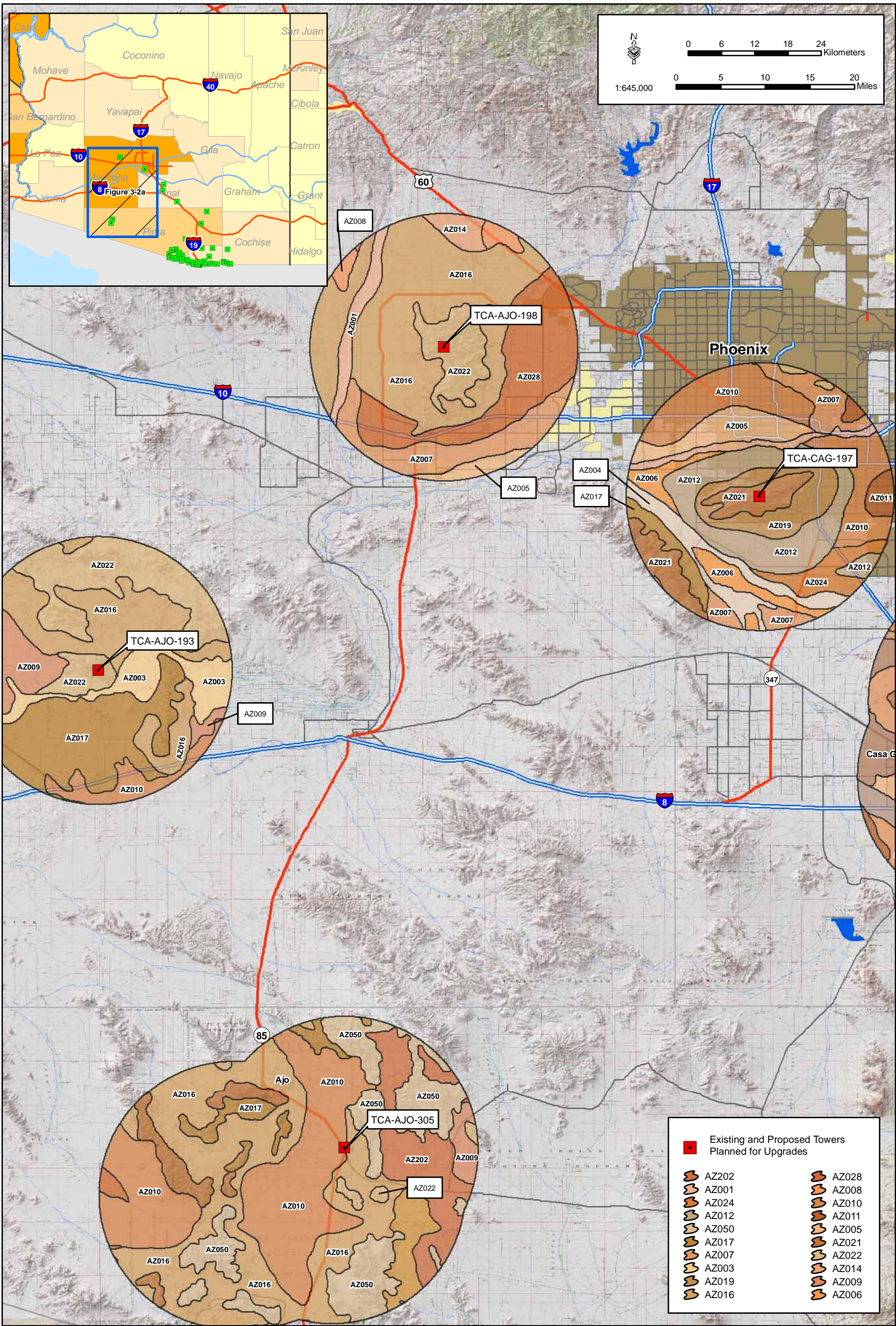


Figure 3-2a: Soil Survey within 15 Miles of Tower Locations

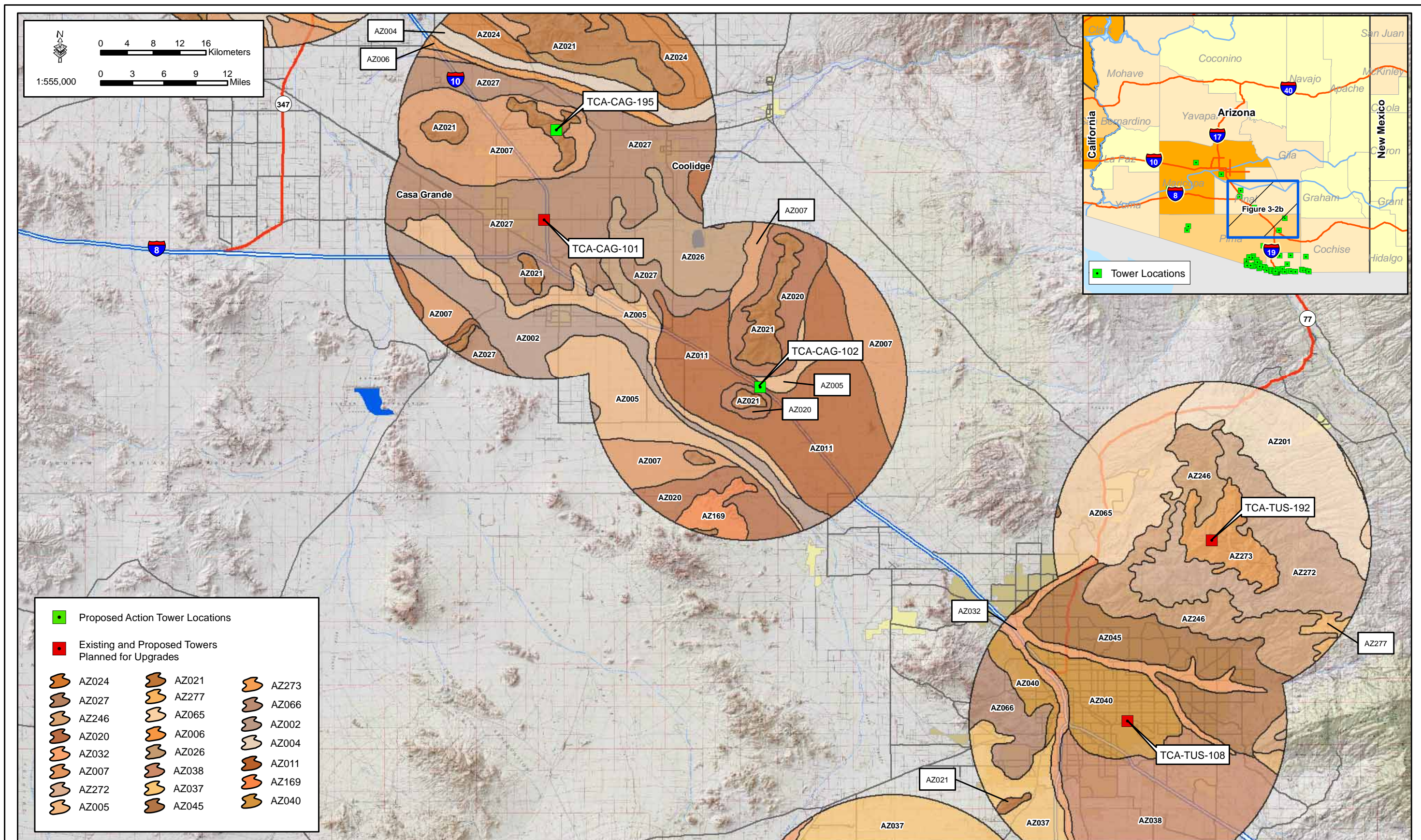


Figure 3-2b: Soil Survey within 15 Miles of Tower Locations

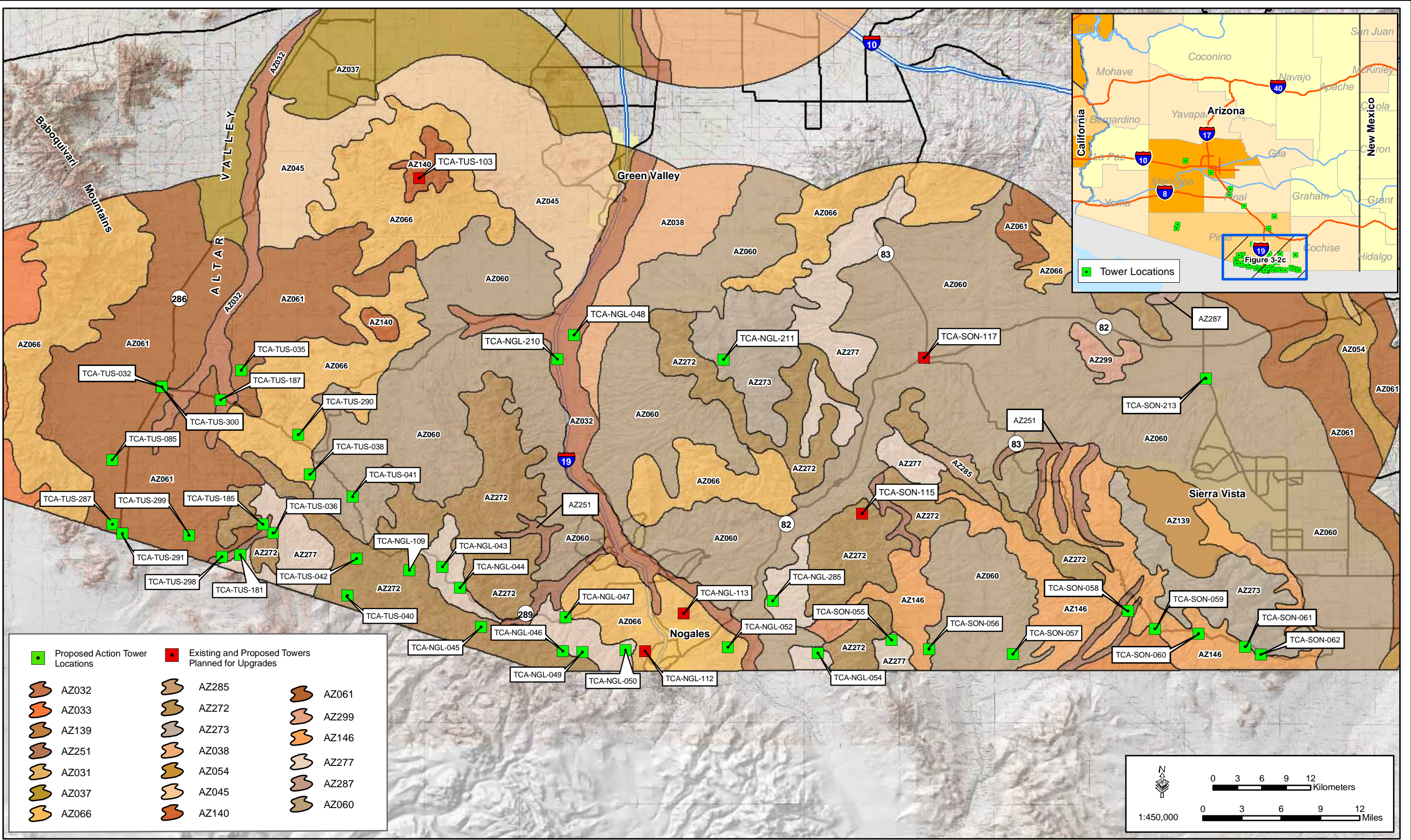


Figure 3-2c: Soil Survey within 15 Miles of Tower Locations

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Table 3-6. SSURGO Soil Data for Tower Sites and Associated New and Improved Access Roads

STATSGO Number	SSURGO Association	Slope (%)	Erosion Hazard	Drainage Class*	Permanent Impacts
AZ060	White House gravelly loam	1-8	Slight to Moderate	WD	0.3262
AZ061	White House-Caralampi Complex	5-25	Moderate	WD	4.701
AZ032	Sasabe-Caralampi complex	1-15	Slight to Moderate	WD	0.024
AZ032	Altar-Sasabe Complex	1-8	Slight to Moderate	WD	0.01157
AZ140	Cortoro Rock Outcrop-Faraway Complex	15-45	Slight	WD	0.4353
AZ061	Nolam-Tombstone Complex	8-30	Slight	WD	0.0138
AZ061	Bernardino-Tombstone Association	5-16	Slight to Moderate	ED to WD	2.727
AZ061	Chiracahua-Lampshire Complex	5-15	Moderate	WD	2.659
AZ011	Denure sandy loam	1-3	Slight	ED	2.7515
AZ010	Denure-Rilito-Why complex	1-5	Slight to Moderate	SED	0.0273
AZ251 AZ272 AZ066	Lampshire-Chiracahua association, steep	10-50	Slight to High	WD	2.076
AZ277 AZ032	Comoro soils	0-5	Slight	WD	0.0298
AZ061 AZ277	White House-Hathaway association, steep	5-45	Moderate	WD	0.0069
AZ061	Bernardino-White House Complex	1-15	Slight to Moderate	WD to ED	
AZ277 AZ061	Caralampi, gravelly sandy loam	10-40	High	WD	0.1209
AZ066	Schrap very shaly clay loam	5-20	Moderate	WD	0.0755
AZ066	Schrap very channery loam	5-30	Moderate	WD	0.5258
AZ066	Schrap cobbly clay loam	20-50	Moderate to High	WD	0.0738
AZ272	Lampshire-Graham-Rock outcrop association, steep	5-50	Moderate	WD	0.9289
AZ277	Atascosa very gravelly sandy loam	30-50	Slight	WD	0.0187
AZ277	Lampshire very gravelly sandy loam	0-25	Moderate	WD	0.6810
AZ272 AZ277	Lampshire very gravelly sandy loam	25-50	Moderate	WD	0.3617
AZ277	Caralampi, gravelly sandy loam, eroded	10-60	High	WD	0.0912
AZ032	Continental Rellino complex, eroded	1-40	High	WD	0.0551
AZ273 AZ277	Barkerville-Gaddes complex, steep	30-60	Moderate	WD	0.8551
AZ277	Chiracahua cobbly sandy loam	10-45	Moderate	WD	0.0262
AZ032	White House gravelly loam	0-10	Slight	WD	0.2920
AZ146 AZ060	White House gravelly loam	10-35	Moderate	WD	0.1353
AZ146 AZ189	Martinez gravelly loam	0-3	Slight	MWD	1.3339
AZ146	Fanno-Luzena, rolling	5-60	Moderate	WD	1.5039
AZ021	Quilitosa, Rock outcrop, Vaiva complex	20-65	Moderate to Severe	SED to WD	0.1284
AZ146	Casto very gravelly sandy loam	10-40	Moderate	WD	0.1997
AZ277	Tortugas-Rock Outcrop Complex	25-60	Moderate	WD	0.0689
AZ060	Libby Gulch complex	0-10		WD	0.3262
AZ273	Faraway-Tortugas-rock outcrop association, steep	20-60	Moderate	WD	4.701

Table 3-6, continued

STATSGO Number	SSURGO Association	Slope (%)	Erosion Hazard	Drainage Class*	Permanent Impacts
AZ061 AZ277	Chiracahua-Lampshire Association. rolling	10-45	Moderate	WD	0.024
AZ277	Sonoita gravelly sandy loam	1-8	Slight to Moderate	SED	0.01157
AZ021	Christobal-Gunsight Complex	3-15	Moderate to High	WD	0.4353
AZ277	Grabe soils	0-3	Slight to Moderate	WD	0.0138
AZ277	Grabe-Comoro Complex	0-5	Slight to Moderate	WD	2.727
AZ032	Riveroad and Comoro soils	0-2	Slight	WD	2.659
AZ061	Graham soils	5-20	Moderate to High	WD	2.7515

*Drainage Class: WD=Well Drained, ED=Excessively Drained, SED=Somewhat Excessively Drained, MWD=Moderately Well Drained
Source: USDA 2008 and 1994

Prime Farmland

Prime farmland is protected under the Farmland Protection Policy Act of 1980 and 1995 (FPPA). The FPPA's purpose is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. As required by Section 1541(b) of Act, 7 USC 4202(b), Federal agencies are, (a) to use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland; (b) to consider alternative actions, as appropriate, that could lessen adverse effects; and (c) to ensure that their programs, to the extent practicable, are compatible with state and local governments and private programs and policies to protect farmland.

Prime farmland exists within the proposed tower areas for Comoro soils, Grabe-Comoro Complex, Grabe soils, Denure sandy loam, Sonoita fine sandy loam, Rilito soils, and Caralampi, gravelly sandy loam, but only if these soils are irrigated. The soils in this region are not typically irrigated so these soils would fail to meet prime farmland criteria.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Geology

Under the No Action Alternative, there would be no construction of access roads and towers, foundations, and associated buildings. Therefore, there would be no impacts on the geologic resources of the area.

Soils

Under the No Action Alternative, there would be no construction of access roads, towers, foundations, and associated buildings would not occur. Therefore, there would be no direct impacts on soils, although soil erosion associated with illegal trails and roads would continue to occur in this area.

3.3.2.2 Proposed Action

Geology

The Proposed Action involves only disturbances to the topsoil layers, or somewhat deeper in the case of SST. During construction activities, any holes or excavations for either perimeter fence posts or towers, would impact an area no larger than approximately 38 square feet for the three piers on the larger SST, and would not substantially alter soils in the project area. Each pier would be no deeper than approximately 30 feet bgs, and only seven of the proposed towers are anticipated to be SSTs. Additionally, all roads proposed would be located in predominately alluvial material and would, therefore, not require substantial modifications to the area's topography (*i.e.*, road cuts).

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on geologic resources. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Soils

Construction of the towers and access roads would permanently impact approximately 41 acres and temporarily impact approximately 73 acres of soils. However, all road repair or improvements would occur on existing roads; therefore, these soils have been previously disturbed. Road work for new and improved roads accounts approximately 63 acres of the 73 acres being impacted and therefore comprises the majority of all temporary impacts for all proposed towers and roads. Although these impacts are long term, they would be minor when examined on a regional scale, due to the small amount of soils lost relative to the quantity of the same soils regionally. The loss of these soils would not affect any unique or sensitive plant or wildlife habitats. Additionally, BMPs to reduce soil erosion would be utilized during construction activities as outlined in Section 5 and the SWPPP which would be prepared prior to construction. No hydric soils would be impacted.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on soils. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Per NRCS data, soils designated as prime farmland if irrigated are located within the tower project area; however these soils are not irrigated, therefore, there would be no impacts on prime farmland (USDA 2008).

3.4 HYDROLOGY AND GROUNDWATER

3.4.1 Affected Environment

The proposed tower sites are located in five Arizona Department of Water Resources (ADWR) groundwater basins: San Rafael, Santa Cruz Active Management Area (AMA), Tucson AMA, Pinal AMA and Upper San Pedro. The Santa Cruz AMA is within the Upper Santa Cruz Valley River Basin and encompasses 716 square miles that is

primarily concentrated around a 45-mile reach of the Santa Cruz River from the International Border to the Continental gaging station, a few miles north of the Santa Cruz/Pima County line (ADWR 2006). The San Rafael Basin encompasses 172 square miles in southeastern Arizona and the main drainage is from the Santa Cruz River and its tributaries. All other drainages in the basin are ephemeral (ADWR 2008). The Tucson AMA consists of the Avra Valley Sub-basin and the Upper Santa Cruz Sub-basin and includes portions of Pima, Pinal and Santa Cruz counties. The Tucson AMA encompasses 3,866 square miles in southern Arizona. The Upper San Pedro Basin encompasses approximately 1,875 square miles of southeastern Arizona and the main drainage is from the San Pedro River. The San Pedro River is ephemeral and mostly flows during major rainfall episodes. The area of the Pinal AMA Basin is approximately 4,000 square miles in central Arizona. The Gila and Santa Cruz rivers acts a source of surface water recharge. These rivers are typically dry except for storm events and during use as flood control (ADWR 2008).

Some areas of the State of Arizona have relatively deep alluvial aquifers with substantial amounts of groundwater in storage. In other areas, however, such as the Upper San Pedro Basin and the Pinal AMA, hydrologic conditions are less favorable. Aquifers may experience an overdraft; Pinal AMA is currently experiencing an overdraft and the Upper San Pedro basin is currently very close to an overdraft. With the exception of the Lower Colorado River Planning Area, groundwater is the primary water supply utilized for municipal uses. In 2003, groundwater was the primary water supply utilized in every AMA (ADWR 2006). Table 3-7 presents the groundwater storage and recharge in each of the four basins in project corridor.

Table 3-7. Groundwater Basins Municipal, Industrial, and Agricultural Use and Recharge Rate

Groundwater Basin	Recharge Rate (acre-feet)	Municipal* Water Use (acre-feet)
San Rafael	5,000	300
Santa Cruz AMA	35,500 - 160,300	56,000 – 62,000
Pinal AMA	370,264	492,712
Tuscon AMA	258,000 – 272,000	225,400 – 236,000
Upper San Pedro	35,750	34,600

Source: ADWR 2006

*Includes industrial and agricultural water use as well.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

The No Action Alternative would not require the use of water because there would be no construction. Therefore, the No Action Alternative would have no impacts on hydrology or groundwater availability or quality.

3.4.2.2 Proposed Action

Under the Proposed Action, water would be required for the concrete tower foundations, watering of new access road surfaces and fugitive dust suppression during construction activities. The water used to compact and construct new access roads typically averages 1.7 acre-foot per mile (554,000 gallons) of new road construction (Miranda 2006). Widening and resurfacing existing roads requires approximately 1 acre-foot per mile (325,841 gallons). Table 3-8 segregates the road construction projects into groundwater basins and estimates the total water use planned for each groundwater basins.

Table 3-8. Road Construction Water Use Segregated by Groundwater Basins

Groundwater Basin	New Road and Construction (miles)	Road Repair or Improvements (miles)	Water Use (acre-feet)
San Rafael	0.1	1.5	1.72
Santa Cruz AMA	0.2	3.4	3.75
Tucson AMA	0.7	6.7	7.89
Pinal AMA	0.0	0.7	0.68
Upper San Pedro	0.1	0.0	0.16
Total	1.1	10.9	14.21

Source: Miranda 2006

The Upper San Pedro and Pinal AMA Basins experience an overdraft of groundwater resources; although the water needs are less than 1 acre-foot in the Upper San Pedro Basin and Tucson AMA, water would need to be trucked in from other basins as these basins are so overtaxed that even minimal water usage would add to the water deficit in these basins. The other basins are experiencing surpluses and the water needs for the proposed project are insignificant compared to the volume used annually for municipal, agricultural, and industrial purposes.

The water used in association with the Proposed Action, which is not lost to evaporation during watering of access road surfaces during construction, would potentially contribute to aquifer recharge through downward seepage. The construction of towers and access roads would not substantially alter natural drainage patterns. The access roads are surfaced with gravel and would not create impermeable surfaces. The construction of the access roads would not interfere with groundwater recharge. Therefore, the Proposed Action would not result in significant impact on groundwater basins and hydrology in the project area.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on groundwater resources. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.5 SURFACE WATERS AND WATERS OF THE U.S.

3.5.1 Affected Environment

All but one of the proposed towers sites and associated access roads are located in the Santa Cruz-Rio Magdalena-Rio Sonoyta (Santa Cruz) watershed. The Santa Cruz watershed is composed of a number of hydrological features: 1) the Santa Cruz River which flows north to the Gila River, and 2) a series of streams that flow south and eventually into the Rio Magdalena and Rio Sonoyta in Mexico. Elevations range from 9,156 feet above sea level at Mount Lemmon to about 1,100 feet at the Gila River. Except for a string of high mountains in the east, most of the watershed is below 5,000 feet, with low Sonoran desert flora and fauna and warmwater aquatic communities where perennial waters exist. The Santa Cruz watershed receives about 15 inches of rain and up to 1 inch of snow per year. Groundwater pumping has eliminated natural perennial flow in most of the mainstream Santa Cruz River. Treated wastewater effluent provides perennial flow below discharges from the cities of Nogales and Tucson. One of the towers sites, TCA-SON-213, is located in the San Pedro River watershed. This watershed encompasses three hydrological areas adjacent to the San Pedro River, which begins in the mountains near Cananea Sonora, Mexico, and flows north about 100 miles through the southeast corner of Arizona to join the Gila River near Winkelman, Arizona. Willcox Playa is a 7,015 square mile watershed which is lightly populated with only 130,000 people (2000 Census). Elevation varies from 4,000 feet above sea level, with desert grassland and warmwater aquatic communities, to 10,700 feet at Mount Graham, with alpine forest. Areas above 5,000 feet typically support coldwater aquatic communities where perennial waters exist. The area gets little precipitation, with 10 to 15 inches of rain and 0 to 5 inches of snow (ADEQ 2007).

3.5.1.1 Surface Waters

Section 303(d)(1)(A) of the Clean Water Act (CWA) requires that "Each State shall identify those waters within its boundaries for which the effluent limitations...are not stringent enough to implement any water quality standard applicable to such waters." ADEQ publishes a report on the status of surface water and groundwater quality in

Arizona every 2 years (in accordance with section 305(b) of the CWA) and from this report derives the "Impaired Waters" or "303(d) List". The 2006 305(b) and 303(d) report by ADEQ assessed 32 stream reaches and seven lakes within the watershed and found three stream reaches to be impaired. Table 3-9 provides information on the impaired stream sections in the Santa Cruz watershed as listed in the 2006 ADEQ 303(d) List. None of the proposed tower and access road construction sites are located near the impaired stream reaches listed in Table 3-9.

Table 3-9. List of ADEQ Impaired Streams in Santa Cruz Watershed

Sub-watershed Name & ADEQ ID	Location	Suspected Causes of Impairment	Suspected Sources of Impairment
Nogales Wash 15050301-011	From Mexico border to Potrero Creek	Copper, ammonia, <i>Escherichia coli</i> and Chlorine	Abandon mines Mexico
Santa Cruz River 15050301-010	New Mexico border to Nogales	<i>E. coli</i>	Natural background and Mexico
Sonoita Creek 15050301-013C	Patagonia Waste Treatment Plant to Santa Cruz River	Zinc and low dissolved oxygen	Abandon mines

Source: ADEQ 2004 303 (d) Water Quality Inventory Integrated Report List of Impaired Watersheds [303 (d) list]

3.5.1.2 Waters of the U.S. and Wetlands

Section 404 of the CWA of 1977 (Public Law [P.L.] 95-217) authorizes the Secretary of the Army, acting through the USACE, to issue permits for the discharge of dredged or fill material into Waters of the U.S. (WUS), including wetlands. WUS (Section 328.3(2) of the CWA) are those waters used in interstate or foreign commerce, subject to ebb and flow of tide, and all interstate waters including interstate wetlands. WUS are further defined and may include waters such as intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, or impoundments of waters, tributaries of waters, and territorial seas. Jurisdictional boundaries for WUS are defined in the field as the ordinary high water marks which is that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory 1987). Although no wetlands exist within the project corridor, the unvegetated WUS would be subject to regulations under Section 404 of the CWA.

Activities that result in the dredging and/or filling of WUS are regulated under Section 404 of the CWA. The USACE has established Nationwide Permits (NWP) to efficiently authorize common activities, which do not significantly impact WUS, including wetlands. The NWPs were modified and reissued by the USACE in the *Federal Register* on March 12, 2007, with an effective date of March 19, 2007. All NWPs have an expiration date of March 19, 2012. The USACE authorizes permitting under a NWP, or requires an Individual Permit. All waterbodies flowing into the U.S. from Mexico or flowing from the U.S. into Mexico are within USACE jurisdiction due to their potential use in foreign commerce. Activities required for the construction, expansion, modification, or improvement of linear transportation crossings (e.g. highways, railways, trails etc.) in WUS, including wetlands are authorized under a NWP 14 if meet the appropriate criteria established for this NWP. The limitation criteria for an NWP 14 are impacts equal to or less than 1/2 acre of non-tidal waters or not greater than 1/3 acres in tidal waters.

There were 62 WUS observed crossing either the access or approach roads associated with 16 of the proposed tower sites. The majority of the washes observed are located at existing low water crossings along existing roads. All washes observed are classified as ephemeral streams and are considered jurisdictional under the CWA for the purpose of this EA. A list of WUS observed during hydrologic surveys of the access and approach roads are presented in Table 3-10.

No potential jurisdictional wetlands or perennial pools were observed at the proposed tower sites, within the footprint of existing approach and access roads, or the proposed footprint of any new roads.

Table 3-10. Waters of the U.S. Associated with the Proposed Tower Sites and Approach and Access Roads

Tower ID	Drainage Type	Periodicity	Width of Channel (feet)	Width of Road (feet)	Proposed Action	Impact (acre)
TCA-TUS-185	Wash	Ephemeral	3	12	Grading	< 0.1
TCA-TUS-185	Wash	Ephemeral	3	12	Grading	< 0.1
TCA-TUS-185	Wash	Ephemeral	2	12	Grading	< 0.1
TCA-TUS-185	Wash	Ephemeral	10	12	Grading	< 0.1
TCA-TUS-185	Wash	Ephemeral	12	12	Grading	< 0.1
TCA-TUS-185	Wash	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-040	Gully	Ephemeral	1	12	Road Construction	< 0.1
TCA-TUS-040	Gully	Ephemeral	3	12	Road Construction	< 0.1
TCA-TUS-040	Wash	Ephemeral	10	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	8	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	10	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	14	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	10	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	12	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	3	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	16	12	Grading	< 0.1
TCA-TUS-040	Wash	Ephemeral	6	12	Grading	< 0.1
TCA-TUS-042	Gully	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-042	Gully	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-042	Wash	Ephemeral	2	12	Grading	< 0.1
TCA-TUS-042	Wash	Ephemeral	2	12	Grading	< 0.1
TCA-TUS-042	Gully	Ephemeral	2	12	Grading	< 0.1
TCA-TUS-042	Gully	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-042	Gully	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-042	Wash	Ephemeral	2	12	Grading	< 0.1
TCA-TUS-287	Depression	Ephemeral	6	12	None	0
TCA-TUS-181	Wash	Ephemeral	5	12	None	0
TCA-TUS-181	Wash	Ephemeral	5	12	None	0
TCA-TUS-181	Wash	Ephemeral	40	12	None	0
TCA-TUS-181	Wash	Ephemeral	3	12	None	0
TCA-TUS-181	Stream	Ephemeral	10	12	None	0
TCA-TUS-181	Stream	Ephemeral	4	12	Grading	< 0.1
TCA-TUS-181	Wash	Ephemeral	1	12	Grading	< 0.1
TCA-TUS-181	Stream	Ephemeral	10	12	Grading	< 0.1
TCA-TUS-181	Stream	Ephemeral	4	12	Grading	< 0.1
TCA-TUS-181	Wash	Ephemeral	1	12	None	0
TCA-CAG-102	Wash	Ephemeral	5	12	None	0
TCA-SON-055	Gully	Ephemeral	12	12	Grading	<0.1
TCA-SON-055	Wash	Ephemeral	10	12	Grading	<0.1
TCA-SON-055	Gully	Ephemeral	7	12	Grading	<0.1
TCA-NGL-054	Wash	Ephemeral	75	12	Grading	<0.1
TCA-NGL-054	Wash	Ephemeral	12	12	Grading	<0.1
TCA-NGL-054	Wash	Ephemeral	35	12	Grading	<0.1
TCA-NGL-049	Wash	Ephemeral	4	12	None	0
TCA-NGL-049	Wash	Ephemeral	14	12	Grading	<0.1

Table 3-10, continued

Tower ID	Drainage Type	Periodicity	Width of Channel (feet)	Width of Road (feet)	Proposed Action	Impact (acre)
TCA-SON-060	Wash	Ephemeral	20	12	None	0
TCA-TUS-035	Wash	Ephemeral	5	12	None	0
TCA-TUS-035	Wash	Ephemeral	9	12	None	0
TCA-TUS-035	Gully	Ephemeral	2	12	None	0
TCA-TUS-035	Gully	Ephemeral	2	12	None	0
TCA-TUS-035	Wash	Ephemeral	15	12	None	0
TCA-TUS-035	Gully	Ephemeral	1	12	None	0
TCA-TUS-035	Gully	Ephemeral	1	12	None	0
TCA-TUS-035	Gully	Ephemeral	2	12	None	0
TCA-TUS-035	Gully	Ephemeral	1	12	None	0
TCA-TUS-035	Wash	Ephemeral	5	12	None	0
TCA-TUS-035	Wash	Ephemeral	5	12	None	0
TCA-SON-058	Wash	Ephemeral	20	12	None	0
TCA-TUS-290	Gully	Ephemeral	2	12	None	0
TCA-CAG-195	Gully	Ephemeral	8	12	None	0
TCA-TUS-298	Depression	Ephemeral	1	12	Road Crossing	<0.1

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, WUS and wetlands would not be directly impacted, since no construction would occur.

3.5.2.2 Proposed Action

Surface waters could be temporarily affected by the proposed construction actions. Short term effects could include a temporary increase in erosion and sedimentation during periods of construction. Disturbed soils and hazardous substances (*i.e.*, anti-freeze, fuels, oils, and lubricants) could directly impact water quality during a rain event. These effects would be minimized through the use of BMPs. A Construction Stormwater General Permit would be obtained prior to construction, and this would require approval of a site-specific SWPPP and Notice of Intent (NOI). A site-specific Spill Prevention, Control and Countermeasure Plan (SPCCP) would also be in place prior to the start of construction. BMPs outlined in these plans would reduce potential migration of soils, oil and grease, and construction debris into local watersheds. Once the construction project is complete, the tower project sites will be re-vegetated with

native vegetation, as outlined in the SWPPP, which would mitigate the potential of non-point source pollution to enter local surface waters.

The implementation of the Proposed Action would require re-grading of existing low-water crossings or the construction of new low-water crossings using in situ material. A total of 37 potential WUS, out of the 62 observed crossings, would be impacted as a result of implementing the Proposed Action. No drainage structures (e.g., concrete low-water crossings) would be constructed as part of the Proposed Action. A Section 404 Permit from the USACE Los Angeles District Regulatory Division would be required to place fill or operate mechanized equipment in jurisdictional WUS. However, because the USACE Los Angeles District typically considers separate utility for each crossing, a NWP 14 would be used for each low-water crossing. All impacts to affected WUS would be less than the 0.1 acre maximum threshold established for reporting requirements under NWP 14. Consequently, all road repair (*i.e.*, grading) or improvements and construction in WUS would be authorized under a NWP 14 and a preconstruction notice would not be required.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on surface waters or WUS. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.6 FLOODPLAINS

3.6.1 Affected Environment

Pursuant to the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001, *et seq.*), and the Flood Disaster Protection Act of 1973 (P.L. 93-234, 87 Statute 975), EO 11988, Floodplain Management, requires that each Federal agency take actions to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and preserve the beneficial values which floodplains serve. EO 11988 requires

that agencies evaluate the potential effects of actions within a floodplain and to avoid floodplains unless the agency determines there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a planning process is followed to ensure compliance with EO 11988. In summary, this process includes the following steps:

- Determination of whether or not the action is in the regulatory floodplain;
- Conduct early public notice;
- Identify and evaluate practicable alternatives, if any;
- Identify impacts of the action;
- Minimize the impacts;
- Reevaluate alternatives;
- Present the findings and a public explanation; and
- Implementation of the action.

This process is further outlined on the Federal Emergency Management Agency's (FEMA), Environmental Planning and Historic Preservation Program web site (FEMA 2006). As a planning tool, the NEPA process incorporates floodplain management through analysis and public coordination, ensuring that the floodplain management planning process is followed. In addition, floodplains are managed at the local municipal level with the assistance and oversight of FEMA. Therefore, any action within these areas would require appropriate coordination and evaluation of the potential effects.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

The No Action Alternative would not result in direct impacts on floodplains or be inconsistent with EO 11988, as no new construction would occur.

3.6.2.2 Proposed Action

Although none of the proposed towers or new and improved access roads are located in the 100-year floodplains as delineated by FEMA, some existing access roads cross the floodplains. Table 3-11 lists the existing access roads and their associated towers that transect the FEMA 100-year floodplains.

Table 3-11. Existing Access Roads Located in FEMA 100-Year Floodplain

Length of Access Road in FEMA 100-year Flood Plain				
Tower Site	Length (feet)	Width (feet)	Area (square feet)	Acres
TCA-NGL-049	2,775	12	33,300	0.76
TCA-NGL-050	75	12	900	0.02
TCA-TUS-038	248	12	2,976	0.07
TCA-TUS 035	4,492	12	53,904	1.24
TCA-AJO-193	1,330	12	15,960	0.37
Total	8,920		107,8040	2.46

Source: CBP access road shape files.

Note: No new or improved access roads intersect floodplains

The development, issuance, and analysis provided by this EA constitutes compliance of EO 11988 as outlined by the 8-part process described above. Additionally, no structures would impede the conveyance of flood waters, decrease floodplain capacity, increase flood elevations, frequencies, or durations. The implementation of the Proposed Action would have no significant effect on floodplain management.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on floodplains. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.7 VEGETATIVE HABITAT

3.7.1 Affected Environment

Biological surveys of the proposed tower sites were conducted by Harris Environmental Group, Incorporated (Harris) during October, November, and December 2007 and then in March, April, and May of 2008 for additional towers (CBP 2008a). A 1-acre site encompassing the proposed tower site was surveyed at each proposed tower site. The vegetative habitats within the project corridor are part of the Sonoran Desertscrub (Arizona Upland and Lower Colorado River Subdivisions), Plains and Semidesert Grasslands, and Madrean Evergreen Woodland (Brown 1994, CBP 2008a). Common

plant species associated with these vegetative habitats are discussed below, and sensitive or rare plant species are discussed below in Sections 3.9.

The Sonoran Desertscrub – Arizona Upland Subdivision occurs on the upper bajadas of mountains between Ajo and the Baboquivari Mountains. This vegetative habitat extends northward from the international border to near Phoenix at its western extent and just north of the Baboquivari Mountains at its eastern extent. Areas of this vegetative habitat can also be found between the Baboquivari Mountains and Tucson and in a narrow band extending northwest from Tucson towards Needles, Arizona. The Arizona Upland Subdivision of Sonoran Desertscrub is characterized by a low and moderately dense cover of shrubs and large cacti with scattered small cacti, grasses, and herbs. Common species include saguaro (*Carnegiea gigantea*), organ pipe (*Stenocereus thurberi*), paloverde (*Parkinsonia* spp.), and several species of cholla (*Cylindropuntia* spp.), nipple cactus (*Mammillaria* spp.), and beehive cactus (*Coryphantha* spp.). Among the wettest of the desert vegetative habitats, the Arizona Upland Subdivision supports a relatively high diversity of plants and animals. Although cattle grazing and urban development have impacted some areas, much of this vegetative habitat is found on the OPCNM and remains relatively undisturbed and intact. However, few of the plant species in this vegetative habitat are fire tolerant and buffelgrass (*Pennisetum ciliare*) has invaded many areas, especially near major roads. Four tower sites are located in this vegetative habitat: TCA-AJO-198, TCA-CAG-102, TUS-CAG-195, and TCA-TUS-108.

The Lower Colorado River Subdivision of Sonoran Desert Scrub occurs on the lower bajadas and vast basin areas west of Ajo. Vast areas of this vegetative habitat occur on the Barry M. Goldwater Range and remain relatively undeveloped. This vegetative habitat is characterized by a low, sparse, and uniform cover of shrub with few cacti, grasses, or herbs. The dominant plants are typically creosote bush (*Larrea tridentata*) and various species of bursage (*Ambrosia* spp.). Mesquite (*Prosopis glandulosa*) and other desert shrubs are often found along wash margins. Cacti are scattered and include barrel cactus (*Ferocactus* spp.), cholla and hedgehog cactus (*Echinocereus*

spp.). This vegetative habitat is the driest of the vegetative habitats in the project area and does not provide adequate amounts of palatable forage for cattle grazing. The species diversity of this vegetative habitat is typically very low and non-native species have less impact. Four tower sites are located in this vegetative habitat: TCA-AJO-193, TCA-AJO-305, TCA-CAG-101, and TCA-CAG-197.

The Plains Grasslands in the project area occur only in the San Rafael Valley and the Sonoita/Eglin Valley and represent the southeastern most extent of this vegetative habitat in the U.S. This vegetative habitat is characterized by a dense cover of grasses, including multiple grama species (*Bouteloua* spp.), galleta grass (*Hilaria jamesii*), and plains lovegrass (*Eragrostis intermedia*), and herbs. Other plant groups, such as shrubs and cacti, are characteristically absent. This vegetative habitat in the project area has been previously disturbed by cattle grazing, fire suppression, roads, and invasive species. Five tower sites are located in this vegetative habitat: TCA-SON-057, TCA-SON-058, TCA-SON-059, and TCA-SON-117.

The Semidesert Grassland vegetative habitat occurs in a complex mosaic interspersed among other vegetative habitats throughout southeastern Arizona. This vegetative habitat is characterized by perennial bunch grasses and scattered shrubs and cacti with bare ground in the intervening spaces. Cattle grazing and fire suppression have significantly affected this vegetative habitat resulting in the replacement of bunch grasses with low growing sod grasses, leaf succulents, shrubs, and most notably by extensive stands of mesquite. Typical perennial grasses include several gramma grasses, three-awn (*Aristida* spp.), bush muhly (*Muhlenbergia porteri*), Arizona cottontop (*Trichachne californica*), and others. Common grasses in heavily grazed areas includes hairy tridens (*Tridens pilosus*), fluffgrass (*T. pulchellus*), the invasive Lehmann Lovegrass (*Eragrostis lehmanniana*), and other less palatable grasses. Yuccas (*Yucca* spp.), beargrass (*Nolina* spp.), and agaves (*Agave* spp.) are also common where fire suppression occurs. A total of 18 tower sites are located in this vegetative habitat: TCA-NGL-052, TCA-NGL-054, TCA-NGL-113, TCA-NGL-210, TCA-NGL-285, TCA-SON-213, TCA-TUS-032, TCA-TUS-035, TCA-TUS-040, TCA-TUS-085,

TCA-TUS-181, TCA-TUS-187, TCA-TUS-287, TCA-TUS-290, TCA-TUS-291, TCA-TUS-298, TCA-TUS-299, and TCA-TUS-300.

The Madrean Evergreen Woodland habitat occurs on mountain slopes throughout southeast Arizona, including the Huachuca Mountains. This vegetative habitat is characterized by a moderate cover of oaks (*Quercus* spp.), pines (*Pinus* spp.), and junipers (*Juniperus* spp.). At lower elevations within this vegetative habitat, the tree canopy is typically more open, and a savannah-like habitat is observed with grasses and cacti being more common. The predominant trees in this vegetative habitat are Arizona white oak (*Quercus arizonica*), Mexican blue oak (*Q. oblongifolia*), and Emory Oak (*Q. emoryi*), and manzanita is a common shrub (*Arctostaphylos pungens*). Although substantial portions of this vegetative habitat are found within CNF, the mild climate of this vegetative habitat makes it highly suitable for settlement by humans and residential development has affected many areas. Although many of the plant species in this vegetative habitat are fire tolerant, cattle grazing and fire suppression have led to conditions which favor stand replacing, catastrophic fires and large portions of this vegetative habitat have been significantly impacted in recent years. A total of 22 tower sites are located in this vegetative habitat: TCA-NGL-043, TCA-NGL-044, TCA-NGL-045, TCA-NGL-046, TCA-NGL-047, TCA-NGL-050, TCA-NGL-109, TCA-NGL-112, TCA-NGL-211, TCA-SON-055, TCA-SON-056, TCA-SON-060, TCA-SON-061, TCA-SON-062, TCA-SON-115, TCA-TUS-036, TCA-TUS-038, TCA-TUS-041, TCA-TUS-042, TCA-TUS-103, TCA-TUS-185, and TCA-TUS-192.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

No direct impacts would occur as a result of the No Action Alternative. However, vegetation communities would continue to be impacted by IC activity that creates trails, damages vegetation, promotes the dispersal and establishment of invasive species, and results in conditions that favor catastrophic wildfires. No direct impact from the project would occur under the No Action Alternative.

3.7.2.2 Proposed Action

Construction of proposed tower sites would degrade or remove 1.8 acres of Sonoran Desertscrub – Arizona Upland Subdivision, 0.3 acre of Sonoran Desert Scrub - Lower Colorado River Subdivision, 2.5 acres of Plains Grassland, 21 acres of Semidesert Grassland, and 0.9 of Chihuahuan Desert Scrub, and 15 acres of Madrean Evergreen Woodland vegetative habitats. Each of these vegetative habitats have been affected by development, cattle grazing, fire suppression, timber harvesting, mining, and the invasion of exotic species over the last century. All of these habitats are locally and regionally abundant; therefore the Proposed Action would not cause the loss of any one of the above mentioned habitats and would not have significant adverse impacts to vegetation communities. Mitigation measures outlined in Section 5 would minimize the spread and establishment of invasive species within the project area.

Many of the roads which lead to tower sites are infrequently used due to poor road conditions; and repair and/or improvements to roads, as well as new road construction, would likely lead to increased recreational use of these vegetative habitats. Increased use by humans, both directly in association with construction and operation of towers and indirectly in association with increased recreational access, is likely to favor invasive species already established and result in the spread of invasive species to new areas. However, the indirect reduction of IC activity would benefit these habitats through the reduction of similar impacts over a much greater area. Furthermore, improved and new roads would serve as fire breaks which would aid efforts to control wildfires and to manage vegetative habitats through the use of controlled burns.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on vegetation resources. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.8 WILDLIFE AND AQUATIC RESOURCES

3.8.1 Affected Environment

Biological surveys of the proposed tower sites were conducted by Harris during October, November, and December 2007 and then in March, April, and May of 2008 for additional towers (CBP 2008a). A 1-acre site encompassing the proposed tower site was surveyed at each proposed tower site. Wildlife species observed, heard, or for which signs were observed during the tower biological surveys are marked by an asterisk in the following discussions (CBP 2008a). Sensitive or rare wildlife species are discussed below in Sections 3.9.

Many of the animals found in Sonoran Desertscrub vegetative habitats are found throughout the warmer and drier regions of the southwestern U.S. Due to a lack of available forage and extreme temperatures, all of the mammals of these vegetative habitats are small and most are nocturnal. The common mammals include several species of bats, coyote (*Canis latrans*), black-tailed jack-rabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), Merriam's kangaroo rat (*Dipodomys merriami*), white-throated woodrat (*Neotoma albigula*), and desert pocket mouse (*Chaetodipus penicillatus*). Other mammals, such as the desert kangaroo rat (*Dipodomys deserti*), Bailey's pocket mouse (*Chaetodipus baileyi*), and round-tailed ground squirrel (*Spermophilus tereticaudus*) are more limited in their distribution and, as such, are more characteristic of Sonoran Desertscrub vegetative habitats.

Birds in these vegetative habitats are typically seed-eaters or are insectivorous. Similar to the mammals, many birds are common throughout the desert regions, including the roadrunner (*Geococcyx californianus*), mourning dove (*Zenaida macroura*), lesser nighthawk (*Chordeiles acutipennis*), cactus wren (*Campylorhynchus brunneicapillus*), black-tailed gnatcatcher (*Polioptila melanura*), phainopepla (*Phainopepla nitens*), and black-throated sparrow (*Amphispiza bilineata*). Some birds more characteristic of Sonoran Desertscrub include Gambel's quail (*Callipepla gambelii*), gilded flicker (*Colaptes chrysoides*), and Gila woodpecker (*Melanerpes uropygialis*).

Reptiles are the most diverse animal group in this vegetative habitat, and many reptiles are also widespread, including the desert tortoise (*Gopherus agassizii*), chuckwalla (*Sauromalus ater*), desert iguana (*Dipsosaurus dorsalis*), rosy boa (*Charina trivirgata*), and western shovel-nosed snake (*Chionactis occipitalis*). Reptiles which are common throughout the desert regions, but have Sonoran Desertscrub subspecies include the banded gecko (*Coleonyx variegatus*), desert spiny lizard (*Sceloporus magister*), glossy snake (*Arizona elegans*), western groundsnake (*Sonora semiannulata*), and western diamondback (*Crotalus atrox*).

The Plains Grassland and Semidesert Grassland vegetative habitats provide more forage than other vegetative habitats in the project area. The climate of these habitats is typically more temperate and rainfall is greater in comparison to the Sonoran Desert Scrub habitats. The pronghorn (*Antilocapra americana*) and bison (*Bison bison*) were once widespread throughout all grassland habitats of the U.S.; however, hunting pressure has affected both species. Although the pronghorn has recolonized many areas, the bison is now restricted to commercial ranches and a few Federally managed lands such as Yellowstone National Park in Wyoming and the Konza Tallgrass Prairie Preserve in Oklahoma. Mule deer (*Odocoileus hemionus crooki*) and javelina (*Pecari tajacu*) have benefited from the expansion of woody species into these vegetative habitats following the introduction of cattle grazing over the last century. Grassland vegetative habitats typically support a high diversity of small mammals. Some characteristic small mammals of the Plains Grassland include the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), swift fox (*Vulpes velox*), plains pocket gopher (*Geomys bursarius*), and plains harvest mouse (*Reithrodontomys montanus*), each of which has adapted to spending most of their time underground. Mammals of the Semidesert Grassland are somewhat more diverse and include the black-tailed jackrabbit, skunk (*Mephitis mephitis*), spotted ground squirrel (*Spermophilus spilosoma*), and several species of mouse and rat, such as hispid pocket mouse (*Chaetodipus hispidus*), three species of kangaroo rats (*Dipodomys* spp.), two species of cotton rats (*Sigmodon* spp.), two species of woodrat (*Neotoma* spp.). The

abundance of small mammals in these vegetative habitats supports ubiquitous populations of coyote.

Because the project area is on the edge of the Plains Grassland distribution in the U.S. many of the grassland birds species found in the area are also at the periphery of their range, including the mountain plover (*Charadrius montana*), lark bunting (*Calamospiza melanocorys*), Gambel's quail, grasshopper sparrow (*Ammodramus savannarum*), and the long-billed curlew (*Numenius americanus*). Other birds are common throughout grassland vegetative habitats and include the turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), sharp-shinned hawk (*Accipiter striatus*), meadowlark (*Sturnella neglecta*), prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), scaled quail (*Callipepla squamata*), ladder-backed woodpecker (*Picoides scalaris*), roadrunner, western kingbird (*Tyrannus verticalis*), ash-throated flycatcher (*Myiarchus cinerascens*), barn swallow (*Hirundo rustica*), cactus wren, white-winged dove (*Zenaida asiatica*), mockingbird (*Mimus polyglottos*), loggerhead shrike (*Lanius ludovicianus*), pyrrhuloxia (*Cardinalis sinuatus*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), and lark sparrow (*Chondestes grammacus*).

The many burrowing mammals in these vegetative habitats provide habitat for a diverse assemblage of snakes including the bullsnake (*Pituophis catenifer sayi*), cornsnake (*Elaphe guttata*), western coachwhip (*Masticophis flagellum testaceus*), and western plains milksnake (*Lampropeltis triangulum celaenops*). Some characteristic reptiles of the Semidesert Grasslands include the western yellow box turtle (*Terrapene ornata luteola*), western hook-nosed snake (*Gyalopion canum*), desert grassland whiptail (*Aspidoscelis uniparens*), canyon spotted whiptail (*Aspidoscelis burti*), ornate tree lizard (*Urosaurus ornatus*), and the southwestern earless lizard (*Cophosaurus texanus scitulus*). Plains Grassland reptiles include the plains spadefoot (*Spea bombifrons*) and lesser earless lizard (*Holbrookia maculata*).

The Madrean Evergreen Woodland vegetative habitat provides abundant forage and mast for white-tailed deer (*Odocoileus virginianus*), which is common throughout these habitats in the southwest. Other common mammals in this vegetative habitat include bobcat (*Lynx rufus*), yellow-nosed cotton rat (*Sigmodon ochrognathus*), southern pocket gopher (*Thomomys umbrinus*), apache squirrel (*Sciurus nayaritensis*), Bailey's pocket mouse, and the eastern cottontail (*Sylvagus floridanus*). Characteristic nesting birds include Montezuma quail (*Cyrtonyx montezumae*), whiskered owl (*Megascops trichopsis*), Arizona woodpecker (*Picoides arizonae*), buff-breasted flycatcher (*Empidonax fulvifrons*), Mexican jay (*Aphelocoma ultramarina*), and bridled titmouse (*Baeolophus wollweberi*). Other common or characteristic birds include the ravens (*Corvus* spp.), black vulture (*Coragyps atratus*), gray hawk (*Buteo nitidus*), acorn woodpecker (*Melanerpes formicivorus*), Hutton's vireo (*Vireo huttoni*), bushtit (*Psaltiriparus minimus*), and black-throated gray warbler (*Dendroica nigrescens*). Woodland habitats also support a variety of reptiles including rock, twin-spotted, ridge-nosed, and black-tailed rattlesnakes (*Crotalus lepidus*, *C. pricei*, and *C. willardi*, *C. molossus*), horned lizards (*Phrynosoma* spp.), ornate tree lizard, green ratsnake (*Senticolis triapsis*), mountain skink (*Eumeces callicephalus*), Mexican garter snake (*Thamnophis eques*), and several others.

Concern about the effects of towers to migratory birds and other birds has been studied for the last 10 years. Oftentimes avian mortality is caused by tower guy wires, other concerns deal with tower lighting as an avian attractant. One recent study by Evans, *et al* (2007), indicates that flashing versus non-flashing light may have more of an influence on attracting birds than the actual color of the light. However, the study also found that there are no differences between darkness and red static, red strobe, or white lights strobe as an attractant.

Other studies have been conducted, which provide information on lighting; but overall these studies lacked peer review and were not transparent (Woodlot Alternatives, Inc. 2007). However, all studies including Evan (*et al.* 2007) indicate that more research is needed to better understand the effects of tower lighting on night-migrating birds.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, no direct impacts to wildlife habitats would occur. However, IC activity would continue to degrade vegetative habitats resulting in decreased suitability for wildlife.

3.8.2.2 Proposed Action

The permanent loss of up to 41 acres and temporary degradation of up to 73 acres of Sonoran Desert habitats would have a minimal impact on wildlife. Although a few sedentary animals could be lost during construction activities, most wildlife would avoid any harm by utilizing the abundance of surrounding habitat. There is a possibility that the proposed surveillance and communication towers could pose hazards to migratory birds; however, since neither RDT nor SST use guy wires, the potential for adverse impacts is greatly reduced. Furthermore, tower construction would adhere to the USFWS 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 (USFWS 2000). Therefore, the Proposed Action is not anticipated to have a significant impact to the sustainability of the wildlife or migratory bird population in the region. The electromagnetic field (EMF) associated with radars could disorient migratory species, thus increasing the potential for bird strikes (Nichols and Racey 2007). Mitigations measures as outlined in Section 5 would ensure there would be no significant impacts on migratory birds.

Repair of access roads and maintenance of towers would cause temporary, short term disturbances to wildlife. However, no significant losses of wildlife population due to operation and maintenance of the towers would be expected. The Proposed Action could result in indirect beneficial impacts to wildlife by reducing the adverse impacts of IC activity on the regional wildlife habitat.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed

Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on wildlife resources. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.9 THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT

3.9.1 Affected Environment

The Endangered Species Act (ESA) was enacted to provide a program for the preservation of endangered and threatened species and to provide protection for the ecosystems upon which these species depend for their survival. All Federal agencies are required to implement protection programs for designated species and to use their authorities to further the purposes of the act. Responsibility for the identification of a threatened or endangered species and development of any potential recovery plans lie with the Secretary of the Interior and the Secretary of Commerce (marine species).

USFWS is the primary agency responsible for implementing the ESA and is responsible for birds and other terrestrial and freshwater species. The USFWS's responsibilities under the ESA include: (1) the identification of threatened and endangered species; (2) the identification of critical habitats for listed species; (3) implementation of research on, and recovery efforts for, these species; and (4) consultation with other Federal agencies concerning measures to avoid harm to listed species.

An endangered species is a species officially recognized by the USFWS as being in danger of extinction throughout all or a significant portion of its range. A threatened species is a species recognized as likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Proposed species are those that have been formally submitted to the Secretary of the Interior for official listing as threatened or endangered. Species may be considered for listing as endangered or threatened when any of the five following criteria occurs: (1) current/imminent destruction, modification, or curtailment of their habitat or range; (2) overuse of the species for commercial, recreational, scientific, or educational purposes; (3) disease or

predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-induced factors that affect continued existence.

In addition, the USFWS has identified species that are candidates for listing as a result of identified threats to their continued existence. The candidate designation includes those species for which the USFWS has sufficient information to support proposals to list as endangered or threatened under the ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity. Although not afforded protection by the ESA, candidate species may be protected under other Federal or state laws.

In 2006, CBP and the *SBI*net program established an on-going relationship with DOI and USFWS to enhance environmental coordination between the agencies. USFWS recognized that the number and scope of CBP projects required a streamlined, project-focused approach to environmental impacts evaluation. To achieve this, USFWS established the Information, Planning, and Consultation (IPAC) system which provides CBP and *SBI*net project planners with information about sensitive resources within the vicinity of a proposed project. The IPAC system provides the following types of information: USFWS trust resources, including threatened and endangered species, designated Critical Habitat, and USFWS refuges that occur in identified project areas, or areas that may be affected by proposed CBP and *SBI*net activities. IPAC also provides USFWS-recommended BMPs that detail how project planners can avoid, minimize, and mitigate adverse effects that could result from project activities. From the beginning of the *SBI*net program, the planners of this Tucson West EA project have routinely consulted with and received guidance from USFWS on various aspects of the project that may potentially affect natural and biological resources in the AORs, and are identifying BMPs and mitigations of potential adverse project impacts to natural and biological resources. Additionally, in October 2007, CBP and DOI jointly established an Identification Interim Assistance Team (IDIAT) to continue to build on the developing cooperative relationship between these agencies. The purpose of the IDIAT is to

exchange information to better understand each others' missions, regulatory restrictions, and to mutually plan a way forward for both agencies' programs.

Biological surveys of the proposed tower sites were conducted by Harris during October, November, and December 2007 and in March, April, and May of 2008 for additional towers (CBP 2008a). Their investigation included surveys for all Federally and state protected species potentially occurring in the project region.

3.9.1.1 Federal

As listed by the Arizona Ecological Field Services Office (AESFO), four candidate species, four threatened species, 31 endangered species and 10 Critical Habitat designations occur within Cochise, Maricopa, Pima, Pinal, or Santa Cruz County, Arizona (AESFO 2007). However, 28 of these species and seven Critical Habitat designations occur outside the range of potential impacts, adverse or beneficial, and would not be affected. The proposed towers would not affect the pronghorn. The remaining 11 species and three designated Critical Habitats, which could be potentially impacted include the, Sonora chub (*Gila ditaenia*) and Critical Habitat, Chiricahua leopard frog (*Rana chiricahuensis*), Sonoran tiger salamander (*Ambystoma tigrinum stebbinsi*), masked bobwhite (*Colinus virginianus ridgwayi*), jaguar (*Panthera onca*), ocelot (*Leopardus pardalis*), Mexican spotted owl (*Strix occidentalis lucida*) and Critical Habitat, western yellow-billed cuckoo (*Coccyzus americanus*), lesser long-nosed bat (*Leptonycteris yerbabuenae*), Huachuca water umbel (*Lilaeopsis schaffneriana recurva*) and Critical Habitat, and the Pima pineapple cactus (*Coryphantha scheeri robustispina*) (Tables 3-12 and 3-13).

Table 3-12. Tower Sites or Access Roads Within or Near Aquatic Habitats Potentially Occupied or Utilized by Sensitive Species

Geographic Area	Tower ID	Sonoran Chub	Critical Habitat	Chiricahua Leopard Frog	Sonoran Tiger Salamander	Huachuca Water Umbel	Critical Habitat	New Tower	New Road (feet)	Roadwork Needed (feet)
Ajo	TCA-AJO-305					X		Y	-	0
Altar Valley	TCA-TUS-032							Y	-	0
	TCA-TUS-035							Y	42	0
	TCA-TUS-085							Y	33	825
	TCA-TUS-187							Y	86	50
	TCA-TUS-287							Y	98	0
	TCA-TUS-291							Y	60	0
	TCA-TUS-299							Y	-	0
	TCA-TUS-300							Y	-	0
Arivaca Creek Basin	TCA-TUS-038							Y	25	0
	TCA-TUS-041							Y	-	178
	TCA-TUS-042			X				Y	3	6155
	TCA-TUS-290							Y	58	50
Black Mesa Area	TCA-TUS-036							Y	-	55
	TCA-TUS-040			X				Y	1,138	13,995
	TCA-TUS-181			X				Y	48	2,107
	TCA-TUS-185			X				Y	49	4,519
	TCA-TUS-298							Y	1,276	0
Sycamore Creek Basin	TCA-NGL-043	X	X					Y	439	0
	TCA-NGL-044	X	X					Y	274	0
	TCA-NGL-045	X	X	X				Y	409	0
	TCA-NGL-109	X	X					Y	-	0
Santa Rita	TCA-NGL-211							Y	132	0
Santa Catalina	TCA-TUS-192							N	-	0
Sierra Rita	TCA-TUS-103							N	-	0
Santa Cruz River Basin	TCA-NGL-046			X				Y	14	1,486
	TCA-NGL-047			X				Y	-	3,803
	TCA-NGL-048							Y	-	0
	TCA-NGL-049			X				Y	88	3,035
	TCA-NGL-050			X				Y	37	1,476
	TCA-NGL-052							Y	68	0
	TCA-NGL-054							Y	185	8,825
	TCA-NGL-112							N	-	0
	TCA-NGL-113							N	-	0
	TCA-NGL-210							Y	78	0
Sonoita Creek Basin	TCA-NGL-285							Y	22	0
	TCA-SON-115							N	-	0
	TCA-SON-117					X	X	N	-	0

Table 3-12, continued

Geographic Area	Tower ID	Sonoran Chub	Critical Habitat	Chiricahua Leopard Frog	Sonoran Tiger Salamander	Huachuca Water Umbel	Critical Habitat	New Tower	New Road (feet)	Roadwork Needed (feet)
San Rafael Valley	TCA-SON-055			X				Y	286	4,014
	TCA-SON-056			X	X			Y	-	0
	TCA-SON-057					X	X	Y	-	3,656
Huachuca Mountains	TCA-SON-058			X	X			Y	106	0
	TCA-SON-059					X		Y	225	0
	TCA-SON-060					X	X	Y	-	0
	TCA-SON-061							Y	95	0
	TCA-SON-062							Y	-	0
Sierra Vista	TCA-SON-213					X		Y		
Totals		4	4	12	2	4	3	44	5,915	54,527

Table 3-13. Tower Sites or Access Roads Within or Near Terrestrial Habitats Potentially Occupied or Utilized by Sensitive Species

Geographic Area	Tower ID	Masked Bobwhite	Mexican Spotted Owl	Critical Habitat	Yellow-billed Cuckoo	Jaguar	Lesser Long-Nosed Bat Roosts	Lesser Long-Nosed Bat Foraging Area	Ocelot	Pima Pineapple Cactus	New Tower	New Road (feet)	Roadwork Needed (feet)
Ajo	TCA-AJO-305							X			Y	-	0
Altar Valley	TCA-TUS-032	X				X	X	X			Y	-	0
	TCA-TUS-035	X			X	X		X		X	Y	42	0
	TCA-TUS-085	X				X	X	X		X	Y	33	825
	TCA-TUS-187	X			X	X		X		X	Y	86	50
	TCA-TUS-287					X	X	X			Y	98	0
	TCA-TUS-291					X	X	X			Y	60	0
	TCA-TUS-299	X			X	X	X	X		X	Y	-	0
	TCA-TUS-300	X				X	X	X			Y	-	0
Arivaca Creek Basin	TCA-TUS-038				X	X		X		X	Y	25	0
Arivaca Creek Basin, continued	TCA-TUS-041				X	X		X		X	Y	-	178
	TCA-TUS-042				X	X		X			Y	3	6,155
	TCA-TUS-290				X	X		X		X	Y	58	50
Black Mesa Area	TCA-TUS-036				X	X		X			Y	-	55
	TCA-TUS-040				X	X		X			Y	1,138	13,995
	TCA-TUS-181				X	X		X			Y	48	2,107
	TCA-TUS-185				X	X		X			Y	49	4,519
	TCA-TUS-298				X	X		X		X	Y	1,276	0

Table 3-13, continued

Geographic Area	Tower ID	Masked Bobwhite	Mexican Spotted Owl	Critical Habitat	Yellow-billed Cuckoo	Jaguar	Lesser Long-Nosed Bat Roosts	Lesser Long-Nosed Bat Foraging Area	Ocelot	Pima Pineapple Cactus	New Tower	New Road (feet)	Roadwork Needed (feet)
Sycamore Creek Basin	TCA-NGL-043			X	X	X		X			Y	439	0
	TCA-NGL-044			X	X	X		X			Y	274	0
	TCA-NGL-045			X	X	X	X	X			Y	409	0
	TCA-NGL-109			X	X	X		X			Y	-	0
Santa Rita	TCA-NGL-211		X	X		X	X	X			Y	132	0
Santa Catalina	TCA-TUS-192		X	X				X			N	-	0
Sierra Rita	TCA-TUS-103					X		X			N	-	0
Santa Cruz River Basin	TCA-NGL-046			X	X	X	X	X		X	Y	14	1,486
	TCA-NGL-047		X		X	X	X	X		X	Y	-	3,803
	TCA-NGL-048				X	X		X		X	Y	-	0
	TCA-NGL-049			X		X	X	X		X	Y	88	3,035
	TCA-NGL-050		X			X	X	X		X	Y	37	1,476
	TCA-NGL-052				X	X		X		X	Y	68	0
	TCA-NGL-054			X		X		X		X	Y	185	8,825
	TCA-NGL-112					X		X		X	N	-	0
Santa Cruz River Basin	TCA-NGL-113				X	X		X		X	N	-	0
	TCA-NGL-210				X	X		X		X	Y	78	0
	TCA-NGL-285				X	X		X		X	Y	22	0
Sonoita Creek Basin	TCA-SON-115		X	X	X	X	X	X			N	-	0
	TCA-SON-117				X	X		X			N	-	0
San Rafael Valley	TCA-SON-055		X			X		X			Y	286	4,014
	TCA-SON-056		X			X		X			Y	-	0
	TCA-SON-057					X		X			Y	-	3,656
Huachuca Mountains	TCA-SON-058					X		X			Y	106	0
	TCA-SON-059					X		X			Y	225	0
	TCA-SON-060					X		X			Y	-	0
	TCA-SON-061					X		X			Y	95	0
	TCA-SON-062					X		X			Y	-	0
Sierra Vista	TCA-SON-213							X			Y	491	0
Totals		8	7	10	25	15		50	19		44	5,915	54,527

Gila Topminnow

The Gila topminnow is native to the Gila River basin of the U.S. and Mexico, and the Río de la Concepción and Rio Sonora basins of northern Mexico (USFWS 1998). The species is tolerant of a broad range of habitat conditions in both lotic and lentic systems, but prefers shallow, warm, fairly quiet waters. Gila topminnow are live bearers and

highly fecund, so populations can rebound quickly, which is probably part of this species' strategy for dealing with periodic droughts that are common in the southwestern U.S. Although current populations are typically found in headwater systems, they have likely been displaced from preferred habitats at lower elevations through competition with non-native fishes. The majority of the existing natural populations occur within the Santa Cruz River basin including sites on upper and lower Sonoita Creek, the Santa Cruz River north of Nogales, upper Cienega Creek, and in the San Rafael Valley. Populations in the upper Gila River basin are primarily introduced.

Sonora Chub

The Sonora chub inhabits intermittent streams of the Rios de la Concepcion Basin in southern Arizona and northern Sonora Mexico, where it occurs in pools near cliffs, boulders, or other cover in the channel (USFWS 1992). In Sycamore Creek, the only reach of the Rios de la Concepcion in the U.S., the Sonora chub is typically found in the largest, deepest, most permanent pools. Sonora chub is adapted to survival in extreme desert conditions and is adept at exploiting small marginal habitats.

Sonora Chub Critical Habitat

In 1986, Critical Habitat was designated for Sonora chub in Sycamore drainage (USFWS 1986) to include the riparian zone of Sycamore Creek, starting from and including Yank's Spring, downstream to the U.S.-Mexico border; the riparian zone of lower Penasco Creek, and a short length of the channel of an unnamed stream that enters Sycamore Creek from the west. Primary constituent elements include clean permanent water with pools, intermediate riffle areas, intermittent pools maintained by bedrock or by subsurface flows, and areas shaded by canyon walls.

Chiricahua Leopard Frog

The Chiricahua leopard frog is a habitat generalist and historically was found in a variety of aquatic habitat types in the Salt, Verde, Gila, San Pedro, Santa Cruz, Yaqui/Bavispe, Magdalena, and Little Colorado River basins (USFWS 2007a). Competition with non-native predators (e.g., American bullfrogs [*Rana catesbeiana*], fishes, and crayfishes)

has restricted the Chiricahua leopard frog to marginal habitats where these competitors are absent. It is currently known from cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,300 to 8,900 feet. Although many Chiricahua leopard frogs have not been recently observed at many previously occupied sites, the general distribution of occurrences includes mountainous areas from between the crests of the Huachuca and Patagonia Mountains, the Santa Rita Mountains, and the Atacosta Mountains west to the Baboquivari Mountains, and Sierrita Mountains. The species requires permanent or semi-permanent pools for breeding, water characterized by low levels of contaminants and moderate pH, and may be excluded or exhibit periodic die-offs where a pathogenic fungus is present.

Sonoran Tiger Salamander

Sonoran tiger salamanders are primarily restricted to stock tanks of the San Rafael Valley (USFWS 2005a, 2007b). Populations could be found in suitable habitats from the crest of the Huachuca Mountains west to the crest of the Patagonia Mountains, including the San Rafael Valley and adjacent foothills from its origins in Sonora north to the Canelo Hills. Tiger salamanders have also been found in areas just outside the San Rafael Valley, such as Fort Huachuca, Harshaw Canyon, Copper Canyon, and CNM. Sonoran tiger salamanders require standing water from January through June for breeding and larval growth. Adult, metamorphosed salamanders inhabit adjacent grassland and oak woodland terrestrial habitat when not in ponds.

Masked Bobwhite

Masked bobwhite was historically associated with the Santa Cruz and Altar Valleys and northern Sonora, Mexico. Currently, populations in the U.S. are sustained through a captive breeding and release program on BANWR (USFWS 1995). Masked bobwhite utilize a variety of habitats associated with open savanna grasslands, such as weedy bottom lands, grassy and herb-strewn valleys, and forb-rich plains. Approximately 80 percent of BANWR provides suitable habitat and masked bobwhite have been observed in suitable habitats adjacent to the refuge (USFWS 2005b).

Breeding, nesting, and hatching cycles are timed to exploit the availability of forage, cover, and invertebrate prey produced in response to summer rains (USFWS 1995). Breeding normally begins in July following summer rains. Nests are built on the ground where cover is essential to conceal the nest. Hatching begins in late July, peaks between September 5 and 20, and ends by late October to early November.

Jaguar

The historic range of the jaguar included a wide belt from central U.S. to central Mexico (USFWS 1997a). Although the greatest abundance of jaguars occurs in tropical environments of Mexico, the range of northern populations extends into the more arid environments of the southwestern U.S. The general distribution of past sightings in the U.S. and the habitat associated with these sightings includes areas of forest, woodland, and grassland vegetation types in the Baboquivari Mountains, the southern portion of the Altar Valley, a southern portion of the Santa Cruz River basin, and the San Pedro River basin south of Aravaipa Creek (Hatten *et al.* 2002, USFWS 2007d).

Recent sightings of jaguar in Arizona have occurred in the Baboquivari Mountains, but are extremely rare. The jaguar may transiently use a wide variety of habitats in the project area. Potential habitats in the U.S. are as extensive as those occupied by the population of jaguars in northern Sonora, Mexico. Thus, habitats in the U.S. could become increasingly important as threats continue in Mexico. Development of infrastructure projects (*i.e.*, pedestrian fences) along the U.S. border may impede movement of jaguars across the border. Because jaguars in Arizona are believed to be part of a population in northern Mexico, preventing jaguar movement and exchange between the U.S. and Mexico will likely have deleterious effects on jaguars, particularly those in Arizona and New Mexico.

Ocelot

The ocelot's range historically included the southern U.S. and northern Mexico (USFWS 1990, AFGD 2004b). Although the greatest abundance of ocelots occurs in tropical environments of Mexico, the range of northern populations extends into the more arid

environments of the southwestern U.S including remnant populations in Texas and transient populations in Arizona. In its northern range the ocelot occurs in subtropical thorn forest, thorn scrub and dense brushy thickets, often in riparian bottomland where it prefers areas of dense ground cover. The ocelot is more adaptable than the jaguar and may persist in partly cleared forests, dense cover near large towns, second growth woodland, and abandoned cultivation, which have gone back to bush. Ocelots are primarily crepuscular and nocturnal, spending the day in heavy brush. Their prey consists of small to medium-sized mammals and birds, but may also include reptiles, fish and invertebrates.

The most recent sighting of ocelot near any of the towers project area occurred 30 miles south of the U.S. border. Recent occurrence of ocelot in the project area has not been confirmed.

Mexican Spotted Owl

In the U.S., the Mexican spotted owl occupies warm-temperate and cold-temperate forests from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona and New Mexico (USFWS 1993). A discontinuous population also occurs in Mexico with a range extending from the Sierra Madre Occidental and Oriental mountains southward to the southern end of the Mexican Plateau. In southeast Arizona, the species typically occurs in mixed-conifer forests, but the species utilizes a variety of habitat types throughout its range. Habitat characteristics which favor the Mexican spotted owl are usually found in old growth forests at least 200 years of age. These characteristics include a dense multi-layered canopy with numerous snags and downed woody matter. Nesting habitat is commonly associated with at least some old-growth trees, steep slopes at elevations from 6,000 to 8,000 feet, and a northern or eastern aspect.

Nesting pairs typically establish a home range of about 1,000 acres which provides year-round access to nesting, roosting, and foraging areas (USFWS 1993). Nesting has been observed on a variety of substrates including artificial platforms, tree cavities,

and cliff ledges. Male and female owls begin roosting together in February and the female begins laying eggs as early as March. Incubation lasts 30 days and most eggs are hatched by the end of May. Fledging occurs from May through October when young owls become fully independent. Mexican spotted owls prey on a variety of small animals hunting from perches and attacking over short distances.

Mexican Spotted Owl Critical Habitat

The structural characteristics of habitat occupied by the Mexican spotted owl vary depending upon the subspecies use of the habitat and changes in plant communities over the subspecies range (USFWS 2004). However, life history requirements of the Mexican spotted owl are met by similar conditions throughout its range. In order to support a breeding pair on a year-round basis, sufficient habitat must occur within the home range and in an appropriate configuration to provide for foraging, roosting, sheltering, nesting, and rearing. Primary constituent elements are grouped by forest and canyon habitats to reflect differences in elements of these habitats which meet life history requirements and by elements related to maintenance of adequate prey species (USFWS 2001a).

Primary constituent elements related to forest structure include:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with a trunk diameter of 12 inches or more when measured at 4.5 feet from the ground;
- A shade canopy created by the tree branches covering 40 percent or more of the ground; and
- Large dead trees (snags) with a trunk diameter of at least 12 inches when measured at 4.5 feet from the ground.

Primary constituent elements related to canyon habitat include one or more of the following:

- Presence of water (often providing cooler and often higher humidity than the surrounding areas);

- Clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation;
- Canyon wall containing crevices, ledges, or caves; and
- High percent of ground litter and woody debris.

Primary constituent elements related to maintenance of adequate prey species include:

- High volumes of fallen trees and other woody debris;
- A wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.

Designated critical habitat areas include the majority of known Mexican spotted owl breeding sites. However, several areas of potential habitat were excluded from designation as critical habitat. These excluded lands include Wildlife Urban Interface areas where the risk of catastrophic wildfires is high, the Penasco Vegetation Management Area which provides valuable research related to forest thinning projects, lands managed by Mescalero Apache, San Carlos Apache, or Navajo Nation, and military lands managed under an Integrated Natural Resource Management Plan, which include Camp Navajo Army Depot, U.S. Naval Observatory Flagstaff Station, and Forts Carson and Huachuca. Five units of Critical Habitat are found in south central Arizona.

Yellow-billed Cuckoo

Yellow-billed cuckoos west of the continental divide are a distinct population segment (DPS) that is a significant component of the total population (USFWS 2001b, AGFD 2002). Breeding populations are scattered throughout much of southeastern Arizona and important areas of habitat are found in Phoenix area rivers (Gila, Hassayampa, Agua Fria, Salt, and Verde), and Tucson area rivers and creeks (Altar Valley; Santa Cruz and San Pedro River; and Sonoita, Arivapa, and Cienega Creeks) (USFWS 2008, AGFD 2004). The western yellow-billed cuckoo is a neotropical migrant and breeds from June 1 to September 30 in riparian vegetation throughout the western U.S. as far north as Washington and Montana. In Arizona, preferred habitats include cottonwood-willow forests and larger mesquite bosques. Nests are built in willow or mesquite

thickets, and egg laying is timed to coincide with outbreaks of insects, especially caterpillars. Fledglings develop quickly and begin the migration back to Mexico.

Lesser Long-nosed Bat

The lesser long-nosed bat's (LLNB) range extends from southern Arizona and extreme southwestern New Mexico, through western Mexico, south to El Salvador (USFWS 1997b). The LLNB primarily utilizes natural caves and abandoned mines for roosting, but can transiently roost among overhanging rocks and other shelters. Occupied roosts have been documented from eastern portions of the Cabeza Prieta National Wildlife Refuge (CPNWR), north as far as Phoenix, and east as far as the Animas Valley in New Mexico (Cockrum and Petryszyn 1991). Use of roosting sites may vary depending upon seasonal fluctuations in the timing of forage availability. Thus, some roosts may be occupied or unoccupied through parts or all of a breeding season.

Female LLNBs arrive at known maternity roosts in southwest Arizona as early as April continuing through mid-July (USFWS 1997b). These maternity colonies begin to disband by September. Both males and females can be found in transient or maternity roosts from September to as late as early November. The bats eat nectar and fruits of columnar cacti and nectar of paniculate agaves, as such, they are considered to be an important dispersal and pollination vector for these species. LLNB are known to travel 30 miles to reach suitable concentrations of forage.

Huachuca Water Umbel

The Huachuca water umbel is found in mid-elevation wetland communities in southern Arizona and northern Sonora, Mexico (USFWS 1999). Known populations occur along the Santa Cruz River and its tributaries in the San Rafael Valley, along Sonoita Creek, along the San Pedro River near the U.S.-Mexico border, and in eastern Cochise County. Huachuca water umbel is typically associated with perennial springs and stream headwaters that have permanently or seasonally saturated and highly organic soils. The Huachuca water umbel requires refugial sites where it is free from scouring caused by flooding. Following a flood event the species is capable of rapidly colonizing

disturbed areas from these refugial populations. Although Huachuca water umbel can persist in dense mats where scouring is absent, populations within flooded areas typically become less dominant as competition with other aquatic plants exceeds its tolerance.

Huachuca Water Umbel Critical Habitat

Critical Habitat for the Huachuca water umbel was designated at seven locations in Santa Cruz and Cochise counties, Arizona (USFWS 1999). Critical Habitat units in Santa Cruz County are located along Sonoita Creek east of State Highway 82, along the Santa Cruz River and an adjacent tributary in the San Rafael Valley, and in Scotia, Sunyside, Gardner and Bear Canyons in the Huachuca Mountains.

The primary constituent elements of Huachuca water umbel Critical Habitat include, but are not limited to, the habitat components that provide:

- Sufficient perennial base flows to provide a permanently or nearly permanently wetted substrate for growth and reproduction;
- A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for expansion;
- A riparian plant community that is relatively stable over time and in which nonnative species do not exist or are at a density that has little or no adverse effect on resources available for growth and reproduction; and
- In streams and rivers, refugial sites in each watershed and in each reach, including but not limited to springs or backwaters of mainstem rivers, that allow each population to survive catastrophic floods and recolonize larger areas.

Pima Pineapple Cactus

The Pima pineapple cactus is found in association with alluvial substrates at elevations below 4,000 feet between the Baboquivari and Santa Rita Mountains, and in low densities in the northern areas of Sonora, Mexico (USFWS 2007c). The Pima pineapple cactus appears to have very general habitat requirements. Several habitat characteristics have been associated with occurrence and abundance of the species, but are not good predictors of population locations. These associated habitat

characteristics are presence of coppice mounds, litter, gravel, moderate cover of herbs and forbs, and presence of the following shrub species: desert zinnia (*Zinnia* sp.), snakeweed (*Gutierrezia sarothrae*), burroweed (*Isocoma tenuisectus*), and buckwheat (*Eriogonum* spp.).

3.9.1.2 State

AGFD Natural Heritage Program maintains lists of wildlife of special concern (WSC) in Arizona. This list includes fauna whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines (AGFD 2007). These species are not necessarily the same as those protected under the ESA. A list of these species is presented in Appendix E.

The Arizona Department of Agriculture (ADA) maintains a list of protected plant species within Arizona. The 1999 Arizona Native Plant Law defined five categories of protection within the state; 1) Highly Safeguarded, no collection allowed; 2) Salvage Restricted, collection only with permit; 3) Export Restricted, transport out of state prohibited; 4) Salvage Assessed, permit required to remove live trees; and 5) Harvest Restricted, permit required to remove plant by-products (ADA 2007). A list of native plants protected by the ADA is included in Appendix E. Only those plants with HS and SR status are discussed here, as other regulated activities would not occur.

Of the 133 highly safeguarded or salvage restricted status species, only two are likely to occur in habitats similar to those found in or near the proposed tower sites: Huachuca water umbel and Pima pineapple cactus. Table 3-14 lists the AGFD and ADA listed species with the potential to exist within or near the proposed tower sites.

Table 3-14. Arizona Listed Species Potentially Occurring Within the Footprint of Proposed New Towers

Species	Status	Preferred Habitat	Potential to Affect Habitat
American peregrine falcon <i>Falco peregrinus anatum</i>	WSC	Steep, sheer cliffs overlooking riparian areas or other habitats supporting prey species.	Low
Baird's Sparrow <i>Ammodramus bairdii</i>	WSC	Short-grass prairies with scattered low bushes and matted vegetation.	Moderate
Cactus ferruginous pygmy-owl <i>Glaucidium brasilianum cactorum</i>	WSC	Mesquite bosques and Sonoran riparian deciduous woodlands.	Low
Northern buff-breasted flycatcher <i>Empidonax fulvifrons pygmaeus</i>	WSC	Open stands of pine or sycamore with bare, weedy, or grassy under story areas.	None
Northern Goshawk <i>Accipiter gentilis</i>	WSC	High, forested mountains and plateaus usually above 6,000ft.	Low
Arizona shrew <i>Sorex arizonae</i>	WSC	Montane conifer forest and oak-pine woodlands with substantial understory vegetation and debris.	Moderate
Desert tortoise - Sonoran subpopulation (<i>Gopherus agassizii</i>)	WSC	Primarily on rocky slopes and bajadas of Sonoran Desert habitats; caliche caves in incised, cut banks of washes (arroyos) are used for shelter sites.	Moderate
Lowland leopard frog <i>Rana yavapaiensis</i>	WSC	Aquatic systems in desert grasslands to pinyon-juniper.	Low
Northern Mexican gartersnake <i>Thamnophis eques megalops</i>	WSC	Densely vegetative habitat surrounding cienegas, cienega-streams, and stock tanks.	None

Key: WSC = wildlife of special concern;
Source: AGFD 2007 and ADA 2007

3.9.2 Environmental Consequences

3.9.2.1 Federal

No Action Alternative

Under the No Action Alternative, there would be no direct impacts on threatened or endangered species or their habitats. However, the impacts of IC activity on habitats throughout the project region and surrounding areas would continue to disturb threatened or endangered species and their habitats. IC activity creates trails, damages vegetation, promotes the dispersal and establishment of invasive species, and can result in catastrophic wild fires. These actions have an indirect adverse impact on threatened and endangered species by causing harm to individuals and degrading habitats occupied by these species.

Proposed Action

Direct effects of the proposed action on Federally listed species include degradation or loss of potential habitat as a result of tower site construction and operation. Additionally, direct effects to Federally listed species would occur from electromagnetic (EM) fields associated with operation of radars. The majority of these effects would be avoided or substantially minimized through the implementation of standard BMPs and other conservation measures such as the training of construction project managers, use of biological monitors, avoidance of disturbance in sensitive habitats or during breeding seasons, and efforts to minimize the spread of invasive species. Indirect effects resulting from the *SBI*net Tucson West project would be primarily limited to changes in IC activity and subsequent CBP interdiction and apprehension efforts. As the level of deterrence increases within areas affected by the proposed action, IC activity is likely to shift to areas where the level of deterrence is lower. Although shifts in illegal activity are reasonably certain to occur, they could occur at nearly any location along the U.S.-Mexico border. Localized shifts in IC activity are also likely to occur. The location of sensor towers is likely to affect patterns of IC movement within the action area as ICs seek new routes through the landscape. The location of towers is also likely to affect the areas in which interdiction and apprehension activities occur. Where ICs activity and subsequent apprehension shifts into habitats occupied by protected species

substantial effects could occur; this would include loss and degradation of habitats, loss or damage to protected species, and avoidance of the area. However, the exact location of these effects is difficult to predict.

The construction of new roads, repair, and improvements made to impassible roads would increase access to habitat occupied or potentially occupied by sensitive species. However, the reduction of similar impacts related to ICs activity would benefit these species within the project area.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including one Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on sensitive species. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Sonora Chub and Critical Habitat

Four tower sites and a total of 1,122 feet of new roads would be constructed within the Sycamore Creek basin approximately 1 mile upstream of Sonora Chub Critical Habitat.

Chiricahua Leopard Frog

A total of 12 tower sites and access roads are within 0.3 miles of potential Chiricahua leopard frog habitat. These include two sites in the Black Mesa area, three sites in the Santa Cruz River basin, one site in the San Rafael Valley, and one site in the Huachuca Mountains. Proposed tower site TCA-TUS-185 and the access roads to TCA-NGL-046, TCA-NGL-049, and TCA-SON-56 are within 0.1 mile of potential habitat.

Sonoran Tiger Salamander

The access road to proposed tower site TCA-SON-059 is within 0.3 miles of potential Sonoran tiger salamander habitat. The access road to TCA-SON-056 is within 0.1 mile of potential habitat. Mitigation measures described in Section 5.0 would be

implemented as part of the Proposed Action to reduce impacts to the Sonoran tiger salamander.

Masked Bobwhite

A total of eight tower sites and five access roads would be constructed within potential masked bobwhite habitat. A total of 161 feet of new road would be constructed and a total of approximately 1,637 feet of access road would be repaired at these locations.

Jaguar

A total of 47 towers sites would be located in habitats identified as potentially suitable for jaguar based on extrapolation from a limited number of past occurrences. Construction of tower sites, new road construction, and repairs to approach roads would result in a temporary increase of noise and human related activity within the affected region. Due to the limited duration and limited area over which these effects would occur relative to the assumed range of the jaguar, the potential for adverse effects to occur would be discountable. Construction related noise effects would not extend more than 1,000 feet from construction activities. Due to the vast amount of equally suitable habitat between tower sites, the potential for noise related effects to result in significant changes in behavior such that the health of individual jaguars would be affected is unlikely. Helicopter deployment would result in noise related effects up to 15,000 feet from the source; however, these effects would also be limited to a maximum of three towers and would also be temporary. Operational related noise, any required maintenance, and post construction monitoring would have similar effects, but would be more limited in extent and duration. Implementation of conservation measures identified during the ESA Section 7 consultation with USFWS would minimize the effects of noise, light, and human presence during construction and operation.

Ocelot

The potential effects of the Proposed Action on the ocelot would be similar to those described for the jaguar. Ocelots are not known to occur in the project area; therefore, construction activities would not affect the species. However, future operation of the

tower sites would result in increased noise and human presence in the potential range of ocelot in the future.

Mexican Spotted Owl and Critical Habitat

A total of three sites and associated access roads would be located within 1 mile of a Mexican spotted owl Primary Activity Center (PAC). Two of these sites (TCA-TUS 192 and TCA-SON-115) are existing tower sites with adequate access roads and would not require any ground disturbance or removal of vegetation. The construction of a new tower site and 132 feet of new road would be required in the Santa Rita Mountains (TCA-NGL-211) and would result in habitat loss and potential isolation of resources for the Mexican spotted owl. Three additional tower sites (TCA-SON-061, TCAS-SON-062, and TCA-SON-115) are within 1 mile of occupied habitat.

A total of 13 tower sites and access roads are located within Mexican spotted owl Critical Habitat (see Table 4-2). These include the three sites already discussed; four new tower sites and 1,122 feet of new roads in the Sycamore Creek basin; two new tower sites, 492 feet of new road construction, and 18,625 feet of road repair in the Santa Cruz River basin, and one existing tower site and access road in the Sonoita Creek basin. The existing towers and access roads would not affect any primary constituent elements of Critical Habitat.

Impacts related to increased noise levels associated with the construction of the proposed towers and access roads, and the operation of the towers would be greater for those towers located in designated critical habitat and/or near a PAC. Studies have shown that spotted owls generally flush at noise levels greater than 92 dBA (Defenders of Wildlife comment letter 2008). However, the exact noise levels that causes a response by Mexican spotted owl is varies on the type of equipment. As shown in Section 3.12, none of the equipment proposed for use would approach or exceed 92 dBA. A combination of equipment operating at the same during construction would combine to create noise levels up to approximately 123 dBA at 50 feet. However, vegetation and topography would be expected to reduce noise levels to 92 dBA within

180 feet. Mitigation measures presented in Section 5.0 would reduce or minimize potential impacts to Mexican spotted owl from increased noise levels.

Yellow-billed Cuckoo

Three tower sites and their associated access roads (TCA-TUS-040, TCA-TUS-181, TCA-CAG-185) within the Black Mesa are within or near potential yellow-billed cuckoo habitat. Habitats at TCA-TUS-040 and TCA-CAG-195 consist of small patches (*i.e.*, generally less than 2 acres) of riparian habitat which include cottonwoods and mesquite. Habitat at TCA-TUS-181 includes over 45 acres of cottonwood and mesquite. One additional tower site (TCA-NGL-048) occurs within 500 feet of a large mesquite bosque. The mesquite bosque near TCA-NGL-048 is surrounded by agricultural fields and is likely to also be affected by periodic noise increases in the area. The three tower sites already discussed and three sites in the Altar Valley, four sites in the Arivaca Creek basin, two additional sites in the Black Mesa area, four sites in the Sycamore Creek basin, seven sites in the Santa Cruz River basin, and two sites in the Sonoita Creek basin are within the potential distribution of migrating yellow-billed cuckoos.

Lesser Long-nosed Bat

A total of 15 tower sites and access roads are within 5 miles of known lesser long-nosed bat roosts. One of these sites, TCA-NGL-115, is an existing tower with adequate access and would not affect the lesser long-nosed bat. However, construction of 14 new tower sites, construction of 871 feet of new roads, and 12,387 feet of road repair would be conducted within 5 miles of known roosts.

A total of 50 tower sites and access roads occur within the range of foraging lesser long-nosed bats. Road repair or improvements would not impact potential foraging areas; however, a total of 5,915 feet of new road construction would occur within 30 miles of known roosts. The extent of foraging habitat within the footprint of new tower sites and road construction is unknown. In order to mitigate for loss of potential forage habitat, each agave plant within the disturbance footprint would be transplanted and replaced with three new plants.

The presence of the proposed towers is not expected to have an effect on LLNB. Bats would be able to avoid the physical structures at the tower site. However, there is a potential for foraging or transient LLNB to collide with wind turbines associated with the tower structure. Specifically, the wind turbine associated with TCA-NGL-109 could disorient LLNB in flight, thus causing an individual to collide with the blades of the turbine and possibly resulting in fatal injury.

The EM fields associated with radar equipment may affect lesser long-nosed bats by causing increasing surface and deep body temperatures, if exposed for prolonged periods or by avoiding foraging habitat areas. Studies have shown that bat activity is reduced in habitats exposed to electromagnetic radiation when compared to site with no such detectable radiation (Nicholls and Racey 2007). Lesser long-nosed bats would be particularly susceptible to EM field strengths greater than 2 volts/meter (Nicholls and Racey 2007). Therefore, it has been determined that the Proposed Action may affect and is likely to adversely affect lesser long-nosed bat. Mitigation measures outlined in Section 5.0 and conservation measures developed during Section 7 consultation would reduce potential impacts to lesser long-nosed bat.

Huachuca Water Umbel

Six proposed tower sites and access roads are upstream of habitat potentially occupied by Huachuca water umbel. Three of these sites, TCA-SON-055, TCA-SON-056, and TCA-SON-117, are more than 2 miles upstream of potential habitats and would not affect the species. Tower site TCA-SON-059 and 225 feet of new roads would be constructed upstream of potentially occupied habitat in the Huachuca Mountains. Tower site TCA-SON-057 and approximately 1,250 feet of access road repair are located upstream of Critical Habitat, and the remaining 2,406 feet of access road repair at this site is upstream of potentially occupied habitat. Tower site TCA-SON-60 and its associated access road are upstream of potentially occupied habitat and Critical Habitat. No road repair or improvements would be required at TCA-SON-060, and that portion of the road which crosses Critical Habitat has an existing bridge.

Pima Pineapple Cactus

A total of 18 new tower sites would be constructed within potential Pima pineapple cactus habitat. This species was observed at two of these new tower sites (TCA-NGL-048 and TCA-TUS-038) and construction activity would likely result in take of any individuals present. However, if possible these individuals would be flagged and avoided. If avoidance is not possible, these individuals would be transplanted outside of the disturbance footprint. The loss of potential habitat would occur at the remaining 16 new tower sites and 2,012 feet of new road construction within the distribution of this species.

With the implementation of standard BMPs and other conservation measures, most adverse affects to sensitive species would be avoided. Species for which the implementation of conservation measures would completely avoid any adverse effect, or would minimize the potential for effect to a insignificant or discountable level, include the Gila topminnow, Sonoran chub and Critical Habitat, Chiricahua leopard frog, Sonoran tiger salamander, masked bobwhite, yellow-billed cuckoo, and Huachuca water umbel and Critical Habitat. Therefore, CBP has determined that the *SBI*net Tucson West project may affect, but is not likely to adversely affect these species.

Construction of tower site TCA-NGL-211 would occur within 1 mile of a Mexican spotted owl PAC; therefore, the adverse affects of habitat loss would not be avoided at this site. Furthermore, some primary constituent elements of Mexican spotted owl Critical Habitat would be affected by new tower sites and access roads. Therefore, CBP has determined that the *SBI*net Tucson West project is likely to adversely affect the Mexican spotted owl and result in adverse modifications to its Critical Habitat.

Pima pineapple cactus was observed at two tower sites and impacts are likely to be unavoidable. Therefore, CBP has determined that the *SBI*net Tucson West project is likely to adversely affect the pima pineapple cactus and result in adverse modification its Critical Habitat.

Potential measures to offset these adverse impacts to these two species are included in the Biological Opinion (BO) and can be found in the Section 5. Mitigation Measures.

3.9.2.2 State

No Action Alternative

Under the No Action Alternative, there would be no direct impacts on threatened or endangered species or their habitats. However, the impacts of IC activity on habitats throughout the project and surrounding areas would continue to disturb threatened or endangered species and their habitats. IC activity creates trails, damages vegetation, promotes the dispersal and establishment of invasive species, and can result in catastrophic wild fires. These actions have an indirect adverse impact on threatened and endangered species by causing harm to individuals and degrading habitats occupied by these species.

Proposed Action

Of the 154 State WSC known to occur in Cochise, Maricopa, Pima, Pinal and Santa Cruz counties, 20 species are likely to occur within communities found at proposed tower sites. Although habitat for the 20 potentially occurring species exists, the area of disturbance for each tower is minor and, therefore, would not significantly impact habitat for these species. Additionally, no occurrences of these species have been documented in the proposed tower sites during field surveys.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on threatened or endangered species or their habitats. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.10 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

3.10.1 Affected Environment

The process of identifying and evaluating potential impacts to cultural resources was described in detail in several documents. Those discussions are incorporated herein by reference (CBP 2007a, INS 2001). Briefly, the National Historic Preservation Act (NHPA) of 1966 established the Advisory Council on Historic Preservation (ACHP) to advocate full consideration of historic values in Federal decision-making and ensure consistency in national policies. Additionally, the NHPA also established the SHPO to administer National historic preservation programs on a state level, and Tribal Historic Preservation Officer (THPO) on tribal lands, where appropriate. The NHPA also established the National Register of Historic Places (NRHP), which is the Nation's official list of cultural resources worthy of preservation and protection. The historic preservation review process mandated by Section 106 of the NHPA is outlined in the ACHP regulations, "Protection of Historic Properties" (36 CFR 800), which were revised and became effective on January 11, 2001.

The cultural overview of the project region was described in various environmental documents and is incorporated by reference (INS 2001). Briefly, the cultural history of southwestern Arizona is usually discussed in periods: Paleo-Indian (circa 11,500 to 8,000 before present [BP]), Archaic (circa 8,000 to 1,400 BP) which is generally divided into the Early, Middle and Late Archaic periods, Formative Period (1,400 to 550 BP) which is generally divided into the Pioneer Period, Colonial Period, Sedentary Period, and Classic Period, Protohistoric and Early Historic Periods (A.D. 1540 to 1860), and Late Historic Period (A.D. 1860 to 1950).

3.10.1.1 Previous Archaeological Investigations

Prior to conducting cultural resource surveys of the proposed and existing tower sites, an archaeological site records search was conducted on the AZSITE Cultural Resource Inventory. Additionally, General Land Office (GLO) maps and patent records were also examined at the BLM and on the GLO records website. This research identified 140

previous cultural resources surveys as having some portion of their survey area within a 1-mile radius of all proposed tower site locations and their associated access roads. The surveys were conducted in support of construction, utility installation, road improvements, land sales, fiber optic installations, cell towers, and drainage infrastructure construction. Additionally, 85 previously-recorded archaeological sites were within a 1-mile radius of the various tower locations and their associated access roads. These sites include prehistoric and historic artifact scatters, an intaglio, a petroglyph, rock features, a folk art site, historic canals and related features, a bridge, a transmission line, a railroad, and trails. Four previously recorded archaeological sites (AZ DD:11:6[ASM], AZ DD:11:9[ASM], AR03-05-03-0220[FS], and AZ DD:10:8[ASM]) intersect the area of potential effect of the surveyed access roads. All four archaeological sites are considered eligible for listing on the NRHP and are considered significant cultural resources.

3.10.1.2 Current Investigations

Cultural resources surveys were conducted by Harris at proposed tower and alternate tower location and along their associated access roads (CBP 2008b; CBP 2008c; CBP 2008d). Fourteen tower locations were excluded from cultural resources surveys because they were located within existing CBP facilities or existing microwave tower facilities where there was no potential to effect cultural resources. A 1-acre area was surveyed at each proposed tower locations to facilitate tower construction and associated construction activities. A 120-foot wide corridor was surveyed in association with access roads where improvements would be required to install or maintain the proposed towers. A total of nine archaeological sites (AZ DD:6:68[ASM], AZ DD:11:7[ASM], AZ DD:11:8[ASM], AZ DD:11:10[ASM], AZ DD:11:11[ASM], AZ EE:5:47[ASM], AZ EE:8:245[ASM], AZ FF:12:56[ASM], and AZ Z:5:81[ASM]) were recorded during the survey of the proposed tower locations and their associated access roads. All of the sites recorded are considered eligible for the NRHP and historic properties. As a result, all the archaeological sites recorded during the survey of these are considered significant cultural resources.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Implementation of the No Action Alternative would have no effect, either beneficial or adverse, on cultural resources, since construction activities associated with towers would not occur.

3.10.2.2 Proposed Action

Under the Proposed Action, four of the NRHP-eligible previously recorded sites (AZ DD:10:8[ASM], AZ DD:11:6[ASM], AZ DD:11:9[ASM], and AR0305030220[FS]) and seven of the newly recorded NRHP-eligible sites (AZ DD:6:68[ASM], AZ DD:11:7[ASM], AZ DD:11:8[ASM], AZ DD:11:10[ASM], AZ DD:11:11[ASM], AZ EE:5:47[ASM], and AZ Z:5:81[ASM]) would not be adversely affected by the proposed construction. These sites would be avoided through the current design plan along with avoidance assurance measures outlined in Section 5 of this document. Two newly recorded NRHP-eligible archaeological sites (AZ EE:9:245[ASM] and AZ FF:12:56[ASM]) would be adversely impacted from the implementation of the Proposed Action. Potential avoidance assurance measures are outlined in Section 5 of this document. With the implementation of these measures, adverse impacts to the sites would be kept below the threshold of adverse effect. No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing (including the proposed Ajo Station tower – TCA-AJO-305) towers.

Beneficial impacts in the form of increased knowledge of the past may be realized as a result of surveys conducted under the Proposed Action. Additionally, potential unidentified cultural resource sites located within the study area and regionally would receive increased protection from disturbance through the deterrence of illegal foot and vehicle traffic from ICs moving through surrounding areas.

3.11 AIR QUALITY

3.11.1 Affected Environment

USEPA established National Ambient Air Quality Standards (NAAQS) for specific pollutants. The NAAQS standards are classified as either "primary" or "secondary" standards. The major pollutants of concern, or criteria pollutants, are carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM-10), and lead (Pb). NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in Table 3-15.

Table 3-15. National Ambient Air Quality Standards

POLLUTANT	STANDARD VALUE	STANDARD TYPE
Carbon Monoxide (CO)		
8-hour average	9ppm (10mg/m ³)	P
1-hour average	35ppm (40mg/m ³)	P
Nitrogen Dioxide (NO₂)		
Annual arithmetic mean	0.053ppm (100µg/m ³)	P and S
Ozone (O₃)		
8-hour average*	0.08ppm (157µg/m ³)	P and S
1-hour average*	0.12ppm (235µg/m ³)	P and S
Lead (Pb)		
Quarterly average	1.5µg/m ³	P and S
Particulate<10 micrometers (PM-10)		
Annual arithmetic mean	50µg/m ³	P and S
24-hour average	150µg/m ³	P and S
Particulate<2.5 micrometers (PM-2.5)		
Annual arithmetic mean	15µg/m ³	P and S
24-hour average	65µg/m ³	P and S
Sulfur Dioxide (SO₂)		
Annual average mean	0.03ppm (80µg/m ³)	P
24-hour average	0.14ppm (365µg/m ³)	P
3-hour average	0.50ppm (1300µg/m ³)	S

Legend: P= Primary
S= Secondary

Source: USEPA 2006

ppm = parts per million

mg/m³ = milligrams per cubic meter of air

µg/m³ = micrograms per cubic meter of air

* Parenthetical value is an approximate equivalent concentration

Areas that do not meet these NAAQS standards are called non-attainment areas or maintenance areas; areas that meet both primary and secondary standards are known as attainment areas. The Federal Conformity Final Rule (40 CFR 51 and 93) specifies

criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Rule was first promulgated in 1993 by the USEPA, following the passage of Amendments to the Clean Air Act (CAA) in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

A conformity analysis is the process used to determine whether a Federal action meets the requirements of general conformity rule. It requires the responsible Federal agency to evaluate the nature of the Proposed Action and associated air pollutant emissions, calculate emissions as a result of the Proposed Action, and mitigate emissions if *de minimis* thresholds are exceeded.

Pima County

The Pima County Department of Environmental Quality (PDEQ) monitors ambient air quality in Pima County, which includes the Tucson metropolitan area. The USEPA considers Pima County as a moderate non-attainment area for PM-10 and a maintenance area for CO and SO₂ (USEPA 2008). However, the PDEQ (2008) claims that the entire county is in attainment for all NAAQS.

Santa Cruz County

Santa Cruz County is designated as a moderate non-attainment area for PM-10 (USEPA 2008). The sources of PM-10 include natural wind storms, wind blown dust from agricultural operations and emissions from the combustion of hydrocarbons in cars, trucks, generators and industrial equipment.

Pinal County

Pinal County is designated as a serious non-attainment area for PM-10 and a moderate non-attainment area for O₃ and SO₂. The non-attainment areas do not encompass the entire county but are located in the northern section of the county which is southeast of the urban areas of Phoenix and Tempe (USEPA 2008). Air emissions from internal

combustion engines produce volatile organic compounds (VOC) and nitrogen oxides (NO_x), which are precursor molecules that react with oxygen in the atmosphere to create O₃.

Cochise County

Cochise County is designated as a moderate non-attainment area for PM-10. The sources of PM-10 include natural wind storms, wind blown dust from agricultural operations and emissions from the combustion of hydrocarbons in cars, trucks, generators and industrial equipment.

Maricopa County

Maricopa County is designated as a serious non-attainment area for PM-10 and a marginal non-attainment area for O₃. It is designated as a serious maintenance area for CO. The non-attainment areas do not encompass the entire county but are limited to the southeastern section of the county where the metropolitan areas of Phoenix and Tempe are located.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

The No Action Alternative would not result in any impacts on air quality because there would be no construction activities.

3.11.2.2 Proposed Action Alternative

Temporary and minor increases in air pollution would occur from the use of construction equipment (combustible emissions) and soil disturbance (fugitive dust), during construction of the communications and sensor towers and repair and construction of roads.

Combustible emission calculations were made for standard construction equipment, such as bulldozers, excavators, pole trucks, front end loaders, backhoes, cranes, and dump trucks, using emission factors from USEPA approved emission model

NONROAD6.2 (USEPA 2001). Assumptions were made regarding the type of equipment, duration of the total number of days each piece of equipment would be used, and the number of hours per day each type of equipment would be used.

Construction workers and delivery trucks would temporarily increase the combustible emissions in the air shed during their daily commute to and from the project area. Emissions from commuter and delivery trucks were calculated using emission factors generated by the USEPA approved emission factor model MOBILE6.2. Their emissions were calculated in the air emission analysis and are included in the totals in Table 3-16.

Table 3-16. Total Emissions (tons/year) from Construction Activities verses De minimis Thresholds, by County

Airshed	Pollutant (tons/year)					
County	CO	VOCs	NOx	PM-10	PM-2.5	SO₂
Pima	42.72	9.26	81.06	8.95	6.96	10.09
<i>de minimis</i>	100	NA	NA	100	NA	100
Santa Cruz	51.64	10.21	81.75	14.09	7.99	10.09
<i>de minimis</i>	NA	NA	NA	100	NA	NA
Pinal	22.91	4.80	37.12	3.83	3.29	4.72
<i>de minimis</i>	NA	100	100	70	NA	100
Cochise	41.08	8.91	76.70	9.23	6.76	9.50
<i>de minimis</i>	NA*	NA	NA	100	NA	NA
Maricopa**	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
<i>de minimis</i>	100	100	100	70	NA	NA

*NA = Not Applicable

** Only one tower is located in Maricopa County in the proposed action. This tower is already existing and was not further analyzed in this EA

Source: Gulf South Research Corporation (GSRC) model projections (Appendix F)

Fugitive dust calculations were made for disturbing the soils while excavating, and grading and constructing the roads and structures. Fugitive dust emissions were calculated using emission factors recommended in USEPA's National Emission Inventory (USEPA 2001) which were the result of field studies conducted by Midwest Research Institute (MRI) (1996).

The total air quality emissions were calculated to determine the applicability of the General Conformity Rule and are provided in Appendix F. A summary of the total emissions, including fugitive dust, heavy equipment operation, and commuter vehicle

emissions, are presented in Table 3-16. As can be seen from this table, the proposed construction activities do not exceed *de minimis* thresholds in the respective counties and, thus, do not require a Conformity Determination.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on air quality. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Several sources of air pollutants contribute to the over all air impacts of the construction project, includes the following:

1. Combustible engines of construction equipment
2. Construction workers commute to and from work
3. Supply trucks delivering materials to construction site
4. Fugitive dust from job site ground disturbances
5. Bi-monthly commute to towers site for maintenance

Air emissions would be produced after the towers have been installed and are operating. A maintenance crew and a propane truck would have to visit the tower site bi-monthly to insure that the equipment is operating properly. The emissions generated during maintenance trips were summarized and included in Table 3-16, above. The USEPA approved air emission model MOBILE6.2 was used to produce emission factors for the calculations. Calculations and assumptions for bi-monthly emissions are presented in Appendix F.

As can be seen from the tables above, the proposed construction activities do not exceed *de minimis* thresholds in each of the counties and, thus, do not require a Conformity Determination. As there are no violations of air quality standards and no conflicts with the state implementation plans, there would be no significant impacts to air quality from the implementation of the Proposed Action.

During the construction of the proposed project, proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust. In particular, wetting solutions would be applied to construction area to minimize the emissions of fugitive dust. By using these environmental design measures, air emissions from the Proposed Action would be temporary and should not significantly impair air quality in the region.

3.12 NOISE

3.12.1 Affected Environment

Noise is generally described as unwanted sound, which can be based either on objective effects (*i.e.*, hearing loss, damage to structures, *etc.*) or subjective judgments (*e.g.*, community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA (A-weighted decibel is a measure of noise at a given, maximum level or constant state level) louder than the same level of intrusive noise during the day, at least in terms of its potential for causing community annoyance. This perception is largely because background environmental sound levels at night in most areas are also about 10 dBA lower than those during the day.

Acceptable noise levels have been established by the U.S. Department of Housing and Urban Development (HUD) for construction activities in residential areas (HUD 1984):

Acceptable (not exceeding 65 dBA) – The noise exposure may be of some concern but common building construction will make the indoor environment acceptable and the outdoor environment will be reasonably pleasant for recreation and play.

Normally Unacceptable (above 65 but not greater than 75 dBA) – The noise exposure is significantly more severe; barriers may be necessary between the site and prominent noise sources to make the outdoor environment acceptable; special building constructions may be necessary to ensure that people indoors are sufficiently protected from outdoor noise.

Unacceptable (greater than 75 dBA) – The noise exposure at the site is so severe that the construction costs to make the indoor noise environment acceptable may be prohibitive and the outdoor environment would still be unacceptable.

As a general rule of thumb, noise generated by a stationary noise source, or “point source,” will decrease by approximately 6 dBA over hard surfaces and 9 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, then the noise level would be 79 dBA at a distance of 100 feet from the noise source, 73 dBA at a distance of 200 feet, and so on. To estimate the attenuation of the noise over a given distance the following relationship is utilized:

$$\text{Equation 1: } dBA_2 = dBA_1 - 20 \log^{(d_2/d_1)}$$

Where:

dBA_2 = dBA at distance 2 from source (predicted)

dBA_1 = dBA at distance 1 from source (measured)

d_2 = Distance to location 2 from the source

d_1 = Distance to location 1 from the source

Source: California Department of Transportation 1998.

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

Under the No Action Alternative, the noise receptors near the tower installations would not experience additional noise events.

3.12.2.2 Proposed Action

The Proposed Action tower sites analyzed in this 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 would also have the potential to impact wildlife and protected species as discussed in Sections 3.8.2.2 and 3.9.1.2. Sensitive receptors within the BANWR or 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). Prior to the start of construction, CBP would 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 would not require the use of auger drills but would 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).

Table 3-17. A-Weighted (dBA) Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances¹

Noise Source	50 feet	100 feet	200 feet	500 feet	1000 feet
Backhoe	78	72	68	58	52
Crane	81	75	69	61	55
Dump truck	76	70	64	56	50
Excavator	81	75	69	61	55
Front end loader	79	73	67	59	53
Concrete mixer truck	79	73	67	59	53
Pneumatic tools	81	75	69	61	55
Auger drill rig	84	78	72	64	58
Bull dozer	82	76	70	62	56
Generator	81	75	69	61	55

Source: FHWA 2007 and GSRC

1. The dBA at 50 feet is a measured noise emission (FHWA 2007). The 100 to 1,000 foot results are GSRC modeled estimates.

Assuming the worst case scenario of 81 dBA and, the noise model projected that noises levels of 81 dBA from the construction equipment would have to travel 300 feet before

they would attenuated 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 would have to travel 300 feet to attenuate to normally acceptable levels of 65 dBA.

One of the towers (TCA-NGL-109) will require the use of a helicopter to install and maintain and two others (TCA-NGL-040 and TCA-TUS-042) may require a helicopter to install and maintain. Noise generated by helicopters is largely dependant on the size and weight of the machine. Helicopter noise levels range from 90 dBA for small helicopters to 110 dBA for large helicopters (FAA 2007) within the immediate vicinity of take-off and landing areas. Assuming that an average helicopter is used, with a noise emission of 100 dBA, the noise model projected that noise emissions from a helicopter flying at 50 feet above ground and takeoff would have to travel 2,700 feet before they would attenuate to acceptable levels of 65 dBA. To achieve an attenuation of 100 dBA to a normally unacceptable level of 75 dBA, the distance from the noise source to the receptor is 900 feet. The three tower sites are located in remote rural areas. The closest sensitive noise receptor to any of the tower sites that may be visited by helicopter is 18 miles away. The impact of the helicopters on the noise environment, used to install and maintain the towers mentioned above, would be insignificant.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on noise. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.13 RADIO FREQUENCY ENVIRONMENT

3.13.1 Affected Environment

The radio frequency (RF) environment refers to the presence of electromagnetic (EM) radiation emitted by radiowaves and microwaves on the human and biological

environment. EM radiations are self propagating waves of electric and magnetic energy that move through space via radio waves and microwaves emitted by transmitting antennas. RF is a frequency or rate of oscillation within the range of about 3 Hertz (Hz) and 300 Giga-Hz (GHz). This range corresponds to frequency of alternating current and electrical signals used to produce and detect radio waves. The EM radiation produced by radio waves and microwaves carry energy and momentum, and can interact with matter.

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 compatibly 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 would be operated are considered law enforcement sensitive and cannot be provided to the public, compliance with FCC and NTIA regulations would be required, and would ensure that recognized safety guidelines are not exceeded. All frequencies used by CBP would 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 *SBI_{net}* Tucson West project would operate below 30 GHz.

The FCC is responsible for licensing frequencies and ensuring that the approved uses would not interfere with television or radio broadcasts or substantially affect the natural or human environment. The FCC adopted recognized safety guidelines for evaluating RF exposure in the mid 1980s (Office of Engineering and Technology [OET] 1999). Specifically, in 1985, the FCC adopted the 1982 American National Standards Institute (ANSI) guidelines to evaluate exposure due to RF transmitters that are licensed and authorized by the FCC (OET 1999). In 1992, ANSI adopted the 1991 Institute of Electrical and Electronics Engineers (IEEE) standard as an American National Standard (a revision of its 1982 standard) and designated it as ANSI/IEEE C95.1-1992 (OET

1999). The FCC proposed to update its rules and adopt the new ANSI/IEEE guidelines in 1993, and in 1996, the FCC adopted a modified version of the original proposal.

In addition to ANSI/IEEE standards, the FCC's guidelines are also based on the National Council of Radiation Protection and Measurements (NCRP) exposure guidelines. The NCRP and ANSI/IEEE exposure criteria identify the same threshold levels at which harmful biological effects may occur. The whole body human absorption of RF energy varies with the frequency of the RF signal. The most restrictive limits on exposure are in the frequency range of 30 to 300 Mega-Hz (MHz) where the human body absorbs RF energy most efficiently when exposed in the air field of an RF transmitting source (ANSI/IEEE C95.1-1992).

There are two tiers of exposure limits; occupational or "controlled" and general or "uncontrolled". Operational exposure is when a person is exposed to RF fields as a part of their employment and the persons have been made fully aware of the potential exposure and can exercise control over their exposure. Uncontrolled exposure is when the general public is exposed or when persons employed are not made fully aware of the potential for exposure or cannot exercise control over their exposure.

In order for a transmitting facility or operation to be out of compliance with the FCC's RF guidelines in an area where levels exceed Maximum Permissible Exposure (MPE) limits, it must first be accessible to the public. The MPE limits indicate levels above which people may not be safely exposed regardless of the location where those levels occur.

Adverse biological effects associated with RF energy are typically related to the heating of tissue by RF energy. This is typically referred to as a "thermal" effect, where the EM radiation emitted by an RF antenna, passes through and rapidly heats biological tissue, similar to the way a microwave oven cooks food. The Health Physics Society indicates that numerous studies have shown that environmental levels of RF energy routinely encountered by the general public are typically far below levels necessary to produce

significant heating and increased body temperature and is generally only associated with workplace environments near high-powered RF sources used for molding plastics or processing food products. In such cases, exposure of human beings to RF energy could be exceeded thus requiring restrictive measures or actions to ensure their safety (Kelly 2007).

There is also some concern that signals from some RF devices could interfere with pacemakers or other implanted medical devices. However, it has never been demonstrated that signals from a microwave oven are strong enough to cause such interference (OET 1999). Furthermore, electromagnetic shielding has been incorporated into the design of modern pacemakers to prevent RF signals from interfering with the electronic circuitry in the pacemaker (OET 1999).

Other non-thermal adverse effects such as disorientation of passing birds by RF waves are also of concern. 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 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.

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

Under the No Action Alternative, the proposed tower sites would not be installed or operated. There would be no impacts to existing RF environment or effect the human or natural environment.

3.13.2.2 Proposed Action

With the implementation of the Proposed Action, the 54 towers equipped with radio wave and microwave communication systems, as well as radar systems, would be installed for use by CBP in maintaining a secure border. As with any RF transmitter, all

of these systems would emit RF energy and EM radiation; therefore, a potential for adverse effects could occur. However, any adverse effects to human safety and wildlife would likely be negligible due to the minimal exposure limits associated with both the type of equipment used and the elevated locations in which they would be positioned on the towers. The tower sites would also be fenced for security, making exposure to RF emitting equipment even less likely.

All frequencies used by CBP would be coordinated through the FCC and NTIA as required by NTIA regulations. Additionally, transmitters and sensors associated with the *SBlnet* Tucson West project would 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 would not result in significant adverse impacts to observatories, human safety or the natural and biological environment.

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 Proposed Action. Furthermore, communication and radar systems installed on the proposed towers would be a minimum of 20 feet off the ground and would not exceed the safe operating distance for these systems (*i.e.*, 17 feet). Thus, maintenance and operational personnel working within the secure tower site would not be exposed to any RF energy that exceeds MPE limits set by the FCC.

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, would be short term and would occur only at close distances from the antennas.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts to existing

RF environment or effect the human or natural environment. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.14 UTILITIES AND INFRASTRUCTURE

3.14.1 Affected Environment

13.14.1.1 Utility Commercial Grid Power

Several commercial utility power companies service the Arizona cities and counties in southeastern Arizona and are shown in Table 3-18.

Table 3-18. Power Company Service Areas

City and or County	Power Company
City of Ajo	Arizona Public Service Company (APS) and Ajo Improvement Company
City of Casa Grande	APS, San Carlos Irrigation, and Electrical District #2
Cochise County (includes Sierra Vista and Huachuca City)	APS and Sulphur Springs Valley Electric Coop
Maricopa County	APS, San Carlos Irrigation, and Salt River Project
Pima County	Tucson Electric Power and San Carlos Irrigation
Pinal County	APS, Salt River Project, San Carlos Irrigation, Santa Cruz Water and Power, Electric District #2 and 4, and Bureau of Indian Affairs
Santa Cruz County (includes Nogales and Sonoita)	Citizens Utilities Company

Source: AZDC 2008c and 2008d, APS 2008, Salt River Project 2008, All Business Newsletter 2006 and Tucson Electric Power Company 2008

Preferred power to the towers within the proposed *SBI*net Tucson West project area is from nearby commercial power grids; however, few of the proposed tower sites are within less than 3 miles to commercial power lines to be economically viable. Currently, only nine of the proposed towers will potentially derive their power from the local power grid. As required by the Proposed Action, power would be extended from the service or secondary pole to each proposed tower utilizing overhead lines. Although power line corridors have not been defined as of yet, coordination is currently underway with the local utility provider within the service area for proposed towers TCA-CAG-102, TCA-

CAG-195, TCA-TUS-287, TCA-TUS-290, TCA-TUS-291, TCA-NGL-285, TCA-SON-056 and TCA-SON-213.

It is assumed that new power lines would be installed adjacent to surveyed new or existing access roads. If it is necessary to deviate from access road locations, then biological and archaeological monitors would be utilized to ensure NHPA Section 106 and environmental compliance. In addition, supplemental NEPA documentation might be required. Due to the large distances to commercial grid power, the majority of the towers within the proposed Tucson West project area would typically be powered by a propane fueled hybrid generator system which consists of a common generator system with supplemental photovoltaic capabilities consisting of 18 solar panels, an energy storage battery system, an inverter, and direct current power subsystems. One proposed tower, TCA-NGL-109 would employ a generator system which would utilize only four solar panels but would also use a wind turbine for the energy storage battery system. The wind turbine would be attached to the roof of the equipment shelter and the blades would be approximately 10 feet in diameter. Consequently, the blade tip would be no higher than 40 feet above the ground.

Each proposed tower is not expected to utilize more than 3,650 kW-hours per month from commercial grid power, generator-solar hybrid, or wind.

The propane fuel source for the generator at each tower would be supplied by local propane dealers. It is anticipated that refueling of each 1,000-gallon propane tank would be required approximately twice a month. For the nine towers in which commercial power may be utilized, there may be instances when commercial power may not be available immediately upon tower deployment. If this should occur, the 35 kW hybrid propane solar generator system would be utilized until commercial power infrastructure can be deployed.

13.14.1.2 Ambient and Artificial Lighting

Ambient or atmospheric light is of concern to many including, most notably, astronomical observatories (International Dark Sky Association 2008). The reduction of man-made or artificial light sources is generally what astronomers would like to see in the southwest and there are light ordinances in place in some cities in the southwest to minimize sky brightness in large population centers. Tucson and Pima County first adopted outdoor lighting ordinances in 1972, to provide standards so that artificial (man-made) lighting did not interfere with nearby astronomical observatories and preserved the relationship of the residents of City of Tucson/Pima County to their unique desert environment through protection of access to the dark night sky (Pima County 2006). Within this ordinance, is a mean lumens threshold per net acre within the county.

Currently, there are four main astronomical observatories complexes within the project area which house various types of astronomical equipment. The complexes include: Kitt Peak National Observatory, Mt. Graham International Observatory, Mt. Hopkins - Fred Lawrence Whipple Observatory, and the Observatories in the Catalinas. There are 32 proposed towers which would be less than 30 miles from any astronomical observatory complex and are listed below in Table 3-19. There are no proposed towers within approximately 30 miles from Mt. Graham International Observatory. Two proposed towers, TCA-TUS-192 and TCA-NGL-211 would be within approximately 1 mile from two different astronomical observatories complex; TCA-TUS-192 to Observatories in the Catalinas and TCA-NGL-211 to Mt. Hopkins - Fred Lawrence Whipple Observatory. One proposed tower, TCA-NGL-048 is 10 miles from Mt. Hopkins - Fred Lawrence Whipple Observatory, while the remaining 31 towers are greater than 10 miles but less than 30 miles away from various astronomical observatory complexes. Two proposed towers would be within less than 30 miles from two astronomical observatory complexes, TCA-TUS-103 and TCA-TUS-290. TCA-TUS-103 would be approximately 23 miles from both Kitt Peak National Observatory and Mt. Hopkins - Fred Lawrence Whipple Observatory, while TCA-TUS-290 would be approximately 28 miles from Mt. Hopkins - Fred Lawrence Whipple Observatory and 29 miles from Kitt Peak National Observatory.

It would be necessary to install FAA required lighting on towers that exceed 200 feet in accordance with FAA regulations, standards, and guidelines for the lighting of tower structures found in 14 CFR Section 77 and FAA Advisory Circulars AC 150/5345-43f and AC 70/7460-1K. Currently, one proposed tower would exceed 200 feet. 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* would be implemented to reduce night-time atmospheric lighting and the potential adverse effects of night-time lighting to migratory bird and nocturnal flying species, and astronomical observatories. Any infrared lighting installed on the proposed towers would be compatible with night vision goggle usage. When the tower sites are lighted for CBP security purposes then lighting would: utilize low sodium bulbs, be shielded to avoid illumination outside the footprint of the tower site, and when possible, be activated by motion detectors.

Table 3-19. Proposed Towers Proximity less than approximately 30 miles from Specific Observatory Complexes

Tower ID	Kitt Peak National Observatory (miles)	Mt. Graham International Observatory (miles)	Mt. Hopkins - Fred Lawrence Whipple Observatory (miles)	Observatories in the Catalinas (miles)
TCA-TUS-032	22 miles	NA	NA	NA
TCA-TUS-035	23 miles	NA	NA	NA
TCA-TUS-038	NA	NA	28 miles	NA
TCA-TUS-041	NA	NA	26 miles	NA
TCA-TUS-042	NA	NA	28 miles	NA
TCA-TUS-085	28 miles	NA	NA	NA
TCA-TUS-103	23 miles	NA	23 miles	NA
TCA-TUS-108	NA	NA	NA	18 miles
TCA-TUS-187	25 miles	NA	NA	NA
TCA-TUS-192	NA	NA	NA	1 mile
TCA-TUS-290	29 miles	NA	28 miles	NA
TCA-TUS-300	22 miles	NA	NA	NA
TCA-NGL-043	NA	NA	NA	NA
TCA-NGL-044	NA	NA	24 miles	NA
TCA-NGL-045	NA	NA	26 miles	NA
TCA-NGL-046	NA	NA	25 miles	NA
TCA-NGL-047	NA	NA	23 miles	NA
TCA-NGL-048	NA	NA	10 miles	NA
TCA-NGL-049	NA	NA	25 miles	NA
TCA-NGL-050	NA	NA	24 miles	NA

Table 3-19, continued

Tower ID	Kitt Peak National Observatory (miles)	Mt. Graham International Observatory (miles)	Mt. Hopkins - Fred Lawrence Whipple Observatory (miles)	Observatories in the Catalinas (miles)
TCA-NGL-052	NA	NA	23 miles	NA
TCA-NGL-054	NA	NA	24 miles	NA
TCA-NGL-109	NA	NA	26 miles	NA
TCA-NGL-112	NA	NA	23 miles	NA
TCA-NGL-113	NA	NA	20 miles	NA
TCA-NGL-210	NA	NA	11 miles	NA
TCA-NGL-211	NA	NA	1 mile	NA
TCA-NGL-285	NA	NA	19 miles	NA
TCA-SON-055	NA	NA	25 miles	NA
TCA-SON-056	NA	NA	27 miles	NA
TCA-SON-115	NA	NA	16 miles	NA
TCA-SON-117	NA	NA	13 miles	NA

Currently, it is not anticipated that night-time construction would occur; however if nighttime construction becomes necessary its use would be minimized and the lights would be shielded and follow county ordinances to the greatest extent practicable.

3.14.2 Environmental Consequences

3.14.2.1 No Action Alternative

Under the No Action Alternative, the proposed towers would not be installed and operated. There would be no impacts on local utilities because no additional power would be needed in the area. Ambient lighting conditions would continue to be problematic near large urban areas such as Tucson.

3.14.2.2 Proposed Action

Negligible demands on power utilities would be required as the result of the Proposed Action. Potentially, nine of the proposed towers would utilize the local commercial power grid. Instead, more renewable sources of power would be employed which allows the generator batteries to be charged during daylight hours, or in the case of TCA-NGL-109 via wind, and once exhausted would switch to propane fuel, a non-renewable resource.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on power utilities. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Of the 54 proposed towers, 23 are greater than approximately 30 miles from any astronomical observatories within the Tucson West Project area; however, approximately 60 percent of the proposed towers are within 30 miles from observatories. Only one tower within the Proposed Action would be over 200 feet in height and as such would be required to follow FAA lighting regulations (TCA-SON-213). However, this tower is greater than 30 miles to any of the known astronomical observatories. The two towers which are within 1 mile from the Kitt Peak National Observatory and the Mt. Hopkins – Fred Lawrence Whipple Observatory complexes would only potentially be lighted for CBP security purposes and would only have small, low sodium light on the equipment shed which would be activated by motion detectors. All other towers do not require FAA lighting and if it is necessary for these towers to be lighted for CBP operational need, such as infrared lighting, then USFWS (2000) *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers* would be implemented to reduce night-time atmospheric lighting and the potential adverse effects of night-time lighting to migratory birds, nocturnal flying species, and nearby astronomical observatories.

Lighting would be necessary for CBP security purposes within the tower perimeter; these lights would 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 would be similar to a residential porch light and would be situated on the equipment shelter.

Additionally, should night-time construction occur, CBP would ensure that all construction lighting would be shielded to minimize ambient lighting issues and would

follow Pima County lighting ordinances to the greatest extent possible. Based on these measures no significant long term impact to the night sky and ambient lighting would occur from the implementation of the Proposed Action.

3.15 ROADWAYS/TRAFFIC

3.15.1 Affected Environment

The tower project sites are located in Maricopa, Pima, Pinal, Cochise, and Santa Cruz counties. The main transportation routes in these areas are four major interstate highways: U.S. Interstate 8 (I-8), I-10, Interstate 17 (I-17) and I-19. I-8 and I-10 run parallel with the Mexican border. I-19 runs north south starting in Tucson, Arizona and ending in Nogales, Arizona. State Highways/SR within the project corridor include SR 85, SR 87, SR 89, SR 90, SR 187, SR 286, SR 289, and SR 387. Table 3-20 shows the highway routes.

Table 3-20. Transportation Routes within the Project Area

Highway	Transportation Route
I-8	Runs parallel with the U.S.-Mexico border
I-10	Runs parallel with the U.S.-Mexico border
I-17	Entirely within Arizona, north terminus in Flagstaff, southern terminus in Phoenix
I-19	Entirely within Arizona, starts in Nogales, southern end at U.S.-Mexico border
SR 82	Western terminus Business Loop I-19, eastern terminus SR 80
SR 83	Northern terminus I-10 near Vail, to Parker Canyon Lake
SR 85	Northern terminus at I-10 in Buckeye, southern terminus near Lukeville
SR 86	Western terminus in Why, eastern terminus at Business Interstate 19 in Tucson
SR 87	Northern terminus in northern Arizona, crosses through Coolidge, Tucson, and Casa Grande
SR 89	Northern terminus at Interstate-40 in Ash Fork, southern terminus where it meets SR 93 near Wickenburg
SR 90	Starts in Bisbee, ends where it meets I-10 near Benson
SR 187	Northern terminus at SR 87, southern terminus at SR 387 near Sacaton
SR 286	Northern terminus at SR 86 (Three Points, Arizona) and southern terminus at Sasabe, Arizona, at the U.S.-Mexico border
SR 289	10 mile road intersecting I-19 and old U.S. Route 89
SR 387	Junction SR 87 to junction SR 84/SR 287 at Casa Grande

Many of the project sites are located in rural, undeveloped areas with agriculture and ranching as the main land uses for the region. Traffic flow is usually low on these roads

because most vehicular movement in the region occurs on the interstates. I-19 and SR 82 and 83 have been affected by increases in the volume of international truck and tourist traffic that have occurred with the passage of the North American Free Trade Agreement.

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

Under the No Action Alternative, the proposed tower sites would not be used. Construction of access roads, towers, foundations, and associated buildings would not occur. There would be no impacts on local vehicular traffic because no construction equipment, materials or construction crews would be needed in the area.

3.15.2.2 Proposed Action

With the implementation of the Proposed Action Alternative, 54 towers would be installed or improved for use by CBP in maintaining a secure border. Construction and staging for the access roads, foundations, towers and associated equipment shelters would create a minor short term impact on roadways and traffic within the project corridor. The increase of vehicular traffic would occur to supply materials and work crews at each tower site for a short amount of time. The towers would be installed within a 60-day work period. The initial construction phase would include creation of a staging area for materials and equipment. Once a staging area is established, traffic near the construction site would be from the influx of construction workers and new materials. Staging areas would be set off the main roads and would not disrupt the flow of traffic.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one Ajo Station tower – TCA-AJO-305). Therefore, there would be no impacts on roadways and traffic. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

There are no anticipated long term impacts on traffic from the installation of the towers. Once construction work is completed, occasional maintenance visits to each site would be required twice a month and potentially only once every 3 to 4 months for certain types of towers. These visits would not increase normal traffic activity locally or regionally.

3.16 AESTHETIC AND VISUAL RESOURCES

3.16.1 Affected Environment

Towers currently exist within the project area and are generally commercial or CBP communications towers. Roads within the CNF, BANWR, and private lands exist and may be maintained by these various entities depending upon land management strategies or plans.

Of the 54 towers, 24 are located on USFS lands in the CNF; TCA-TUS-036, TCA-TUS-038, TCA-TUS-040, TCA-TUS-041, TCA-TUS-042, TCA-TUS-181, TCA-TUS-185, TCA-TUS-298, TCA-NGL-043, TCA-NGL-044, TCA-NGL-045, TCA-NGL-046, TCA-NGL-047, TCA-NGL-049, TCA-NGL-050, TCA-NGL-054, TCA-NGL-109, TCA-NGL-211, TCA-SON-056, TCA-SON-057, TCA-SON-058, TCA-SON-059, TCA-SON-060, and TCA-SON-061. Several of these proposed towers in the CNF already have towers either at the current site or very near to the current site such TCA-TUS-181, TCA-NGL-046, TCA-NGL-109, and TCA-NGL-211 and should not change the present visual resources. For the remaining 20 towers there may be visual resources management requirements.

Additionally, in 1974 the USFS developed the Visual Management System which set standards for evaluating landscape aesthetics. In 1996, the Forest Service developed the Scenery Management System (SMS) which builds upon the Visual Management System. The SMS provides:

- definitions of existing and desired aesthetic conditions of the landscape;
- estimating relative importance of the landscapes based on "sense of place" or "place attachment" mapping;

- a classification index to evaluate aesthetics versus other resource values,, and;
- aesthetic, along with ecological, sustainability.

The USFS has received coordination letters at the inception of the proposed SBInet Tucson West project and coordination will continue during the NEPA process. This document will address any visual resource classification or restrictions from USFS upon receipt, if prior to the issuance of the Final EA.

Five towers are located on BANWR: TCA-TUS-035, TCA-TUS-085, TCA-TUS-187, TCA-TUS-287, and TCA-TUS-299. Proposed tower site, TCA-TUS-187, is located on areas with existing towers so there will be no new affect to the present visual resources. CBP is coordinating with USFWS regarding five tower sites that are proposed for the BANWR. Construction of these five sites is contingent upon a USFWS determination that they are appropriate and compatible uses in the BANWR.

TCA-SON-062 is located at the Montezuma Pass Overlook on the CNM. The overlook is a developed tourist site with paved parking and restrooms. Additionally, proposed tower site TCA-TUS-291 is very near the BANWR but is actually within the Sasabe POE.

3.16.2 Environmental Consequences

3.16.2.1 No Action Alternative

Under the No Action Alternative, the aesthetics of the project region would not be directly affected by installation of towers. However, trash, graffiti, and general vandalism resulting from IC traffic would be expected to continue to detract from the visual quality of area. It has been estimated that each IC leaves an average 8 pounds of trash on U.S. soil per entry (Davis 2005).

3.16.2.2 Proposed Action

The installation of towers would detract from the aesthetic resources of the proposed corridor. However, these infrastructure components would be located primarily within

undeveloped or agricultural areas and near existing stations. The proposed towers are a common component structure along major U.S. routes. That, combined with the fact that the towers would be 6 to 10 miles apart would mean minimal visual impacts to the regional landscape. Although, TCA-SON-062 is located in the CNM on NPS land, the impacts would be minor to moderate as the area is developed for tourism and includes a rest area and bathroom facility. Therefore, overall impacts on aesthetic quality of the area would be insignificant except for the proposed tower in the CNM which would have minor impacts.

Tower TCN-SON-062 is located within the CNM visitor overlook parking lot, and this location would 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 (NPS 2006). CBP will consult with the superintendent of the CNM regarding placement of the tower, and will obtain a use permit from the NPS in accordance with GSA Bulletin FPMR D-242 and NPS Management Policies, Section 8.6.4.3 (NPS 2006).

Approximately 1.2 miles of new access road and 11.9 miles of access road repair and/or improvements are proposed in conjunction with the installation of the proposed new towers. The largest new access road which would be constructed is associated with TCA-TUS-298 at 0.35 mile (1,872 feet) of new road, while the second largest amount of new access road (0.22 miles) and the largest road repair would be associated with TCA-TUS-040 with approximately 2.65 miles (13,995 feet). All other new and repaired access roads are well below these amounts and range from 3 feet to 491 feet while road repair or improvements range from less than 0.01 mile (50 feet) to 1.83 miles (9,684 feet). Most of the new access road work is very near the proposed tower site and near existing access roads. Therefore, the visual and aesthetic impacts from road work would be minor.

One proposed tower site (TCA-SON-055) is within 1 mile of the historic town site of Washington Camp and 0.5 mile west of Duquesne Mine. There would not be any

impact to the aesthetic appeal of the town site with the implementation of the Proposed Action. Ultimately, the Proposed Action, by deterring IC activity, would provide protection for those resources (native ecosystems and cultural sites) which add to the aesthetic value of the proposed tower corridor.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one Ajo Station tower – TCA-AJO-305). All of the towers currently impact aesthetics and visual resources by virtue of the tower presence within the areas. The upgrades to the towers strictly occur to the existing communication hardware arrays, which would be similar in appearance to the general public. Therefore, there would be no additional impacts on aesthetic and visual resources. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.17 HAZARDOUS MATERIALS

3.17.1 Affected Environment

Solid and hazardous wastes are regulated in Arizona by a combination of laws promulgated by the Federal, state and regional Councils of Government. Typically, CBP performs a Phase I Environmental Site Assessment for all state and private properties that are being considered for lease or purchase. A Phase I Environmental Site Assessment allows CBP to know if a property is likely to have any recognized environmental conditions which would indicate the possibility of soil, surface water or groundwater contamination within the properties' boundaries. All proposed tower sites in which no Phase I Environmental Site Assessment was performed had a search conducted on the USEPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). In addition, GSRC contracted Environmental Data Resources to produce radius reports which examine Federal and state environmental databases that track activities associated with hazardous waste and incidents that have resulted in major environmental impairment. These databases are prepared and maintained by various Federal and state environmental agencies,

such as the USEPA and the Arizona Department of Environmental Quality (AZDEQ). CERCLIS contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities, including sites that are on the National Priorities List (NPL) or being considered for the NPL.

CERCLIS and radius reports search found no active NPL sites within a 1-mile radius of any of the proposed tower sites located in Maricopa, Pima, Santa Cruz, Pinal, and Cochise counties, Arizona. However, the radius reports did show a Leaking Underground Storage Tank (LUST) site within 0.5 miles of proposed tower TCA-NGL-210 and a solid waste transfer station site within 700 feet from proposed tower site TCA-TUS-300. The LUST site would not impact the proposed tower as the leaking tanks have been removed and the contaminated soil has been removed since 1990. No groundwater concerns were noted with this LUST site. Odors and noise are generally the issues of concern with solid waste transfer stations. CBP should coordinate with the owner and operator of the transfer station prior to the start of construction to ensure that there would be no impact to transfer station operations during installation of the tower.

One site, TCA-CAG-195, is on the Gila Indian Reservation and as such would need coordination with the Tribal Council to ensure compliance with any environmental practices are regulations that the Tribal Council may administer.

Field pedestrian site surveys for the Phase I Environmental Site Assessments were preformed for the five proposed tower sites by Harris from October 2007 to November 2007 and include proposed tower sites: TCA-CAG-102, TCA-NGL-048, TCA-NGL-052, TCA-SON-055, TCA-TUS-290, and TCA-SON-213 (CBP 2008c, d, e, f, g, and h). An additional Phase I survey was done for TCA-NGL-285 by Harris in June 2008 and GSRC performed two Phase I survys for TCA-TUS-290 and TUS-041 also in June 2008. Site reconnaissance was conducted according to the American Society for Testing and Materials (ASTM) guidelines (ASTM E1527-05), which define good commercial and customary practices in the U.S. for conducting a Phase I Environmental Site Assessment of a parcel of commercial real estate. ASTM E1527-05 pertains to a

range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act 42 U.S.C. 9601 (CERCLA) and petroleum products (ASTM 2008).

Included in these Phase I investigations were searches of a number of different environmental regulatory databases. As part of the Phase I Environmental Site Assessment, Harris performed a CERCLIS search within 1 mile radius from each tower site for each of the 5 proposed towers. No tower sites had any NPL sites listed within the 1 mile radius (CBP 2008e, f, g, h, i, and j). All environmental databases and field surveys yielded no issues of environmental concern, with the exception of the three towers listed below, TCA-CAG-102, TCA-SON-05, and TCA-NGL-048. These proposed tower sites had the following issues noted in the Phase I Environmental Site Assessments, but had no evidence of recognized environmental conditions.

TCA-CAG-102

Two convenience stores leaking underground storage tanks (LUSTs), identified by the State of Arizona as LUST and UST (underground storage tanks) sites, were located within 0.25 miles from proposed tower site TCA-CAG-102. Tanks at both of these sites were removed and the sites were closed in 1995 and 1996, respectively. One of the convenience stores currently has USTs in place, but there is no indication of any release of tank contents (CBP 2008e).

TCA-SON-055

Mining activity historically occurred on and near the proposed tower site. Mine air vents, a closed mine shaft, and other mining excavations are within the surveyed proposed tower site area, although no other issues or concerns were noted with the property (CBP 2008h).

TCA-NGL-048

De minimis conditions in regard to stained soils were observed on the tower site near existing CBP mobile observation tower equipment apparently due to leaking diesel or hydraulic fuel (CBP 2008f).

TCA-TUS-290

No issues or concerns were noted with the property (CBP 2008k).

TCA-TUS-041

No issues or concerns were noted with the property (CBP 2008l).

TCA-NGL-285

No issues or concerns were noted with the property (CBP 2008m).

In summary, the Phase I Environmental Site Assessments for the proposed tower sites: TCA-CAG-102, TCA-SON-055, TCA-SON-213, TCA-NGL-048, TCA-NGL-052, TCA-TUS-290, TCA-TUS-041 and TCA-NGL-285 found no historical or current information that would indicate the possible presence of a *recognized environmental condition* at each of the sites assessed. Additionally, no further investigations were recommended at any of these tower sites (CBP 2008e, f, g, h, i, j, k, l, and m).

3.17.2 Environmental Consequences

3.17.2.1 No Action Alternative

The No Action Alternative would not contribute any hazardous waste or materials to the project areas, as no construction of towers or access roads would take place.

3.17.2.2 Proposed Action

Construction Activities

During construction of new towers and access roads, 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 would

include primary and secondary containment measures. Clean-up materials (e.g., oil mops) would be maintained at each site for appropriate spill response and cleanup in case an accidental spill occurs. Drip pans would 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 would be in place prior to the start of construction activities as outlined in Section 5.

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

Proposed tower site TCA-SON-055 could potentially have mine tailings and soils which may contain contaminants within the property area. Depending on the type of mining that was performed at the site, specific heavy metals may be present as contaminants of concern in soils and groundwater from mining activities. Although the Phase I Environmental Site Assessment did not state that further investigation is warranted, it would be prudent to check historic mine records, to ensure that no mine tailings are present which may have contamination above specific state levels of concern.

With implementation of these practices, or in the case of TCA-SON-055 a historical check, the Proposed Action would not result in a significant environmental or public exposure on any hazardous materials.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on hazardous materials. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Maintenance and Operations Activities

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

The Proposed Action may result in indirect beneficial impacts on solid and hazardous waste. As illegal vehicle and pedestrian traffic is reduced or eliminated within the project corridor, fewer abandoned vehicles and other solid or hazardous waste associated with illegal cross border activities would be expected.

3.18 SOCIOECONOMICS

3.18.1 Population and Demographics

The ROI of the proposed action consists of a five-county area along the southern border in Arizona, including Cochise, Maricopa, Pima, Pinal, and Santa Cruz counties. The population and racial mixes of the different counties are presented in Table 3-21. Population in each of the counties ranges from 3,768,123 in Maricopa County in 2006 (U.S. Census Bureau [USCB] 2006c) to an estimated 43,080 in Santa Cruz County (USCB 2000). There was positive population growth in all counties within the ROI. This growth, between 1990 and 2006, ranged from 42 percent in Pima County to 132 percent in Maricopa and Pinal counties (USCB 2006f, g, h, i and j). The racial mix of the area is predominated by Caucasians in all counties ranging from 70 percent in Pima County to 80 percent in Maricopa County. Both Santa Cruz County and Pima County have the majority of the population claiming to be of Hispanic origin, 81 percent and 33 percent respectively.

Table 3-21. Population and Race Estimates within the Area of Operations

Location	White (percent)	African American (percent)	Asian (percent)	Native American (percent)	Some Other Race (percent)	Hispanic Origin (percent)	Total Population (percent)
Arizona (2006)	4,741,310 (76.9)	207,837 (3.4)	144,858 (2.3)	NR	1,072,313 (17.4)	1,803,377 (29.2%)	6,166,318
Cochise (2006)	106,528 (83.4)	5,442 (4.3)	1,800 (1.4)	NR	13,987 (10.9)	40,331 (31.6%)	127,757
Maricopa (2006)	3,019,221 (80)	154,746 (4)	108,661 (3)	6,761 (0.2%)	478,734 (12.8)	1,129,556 (30%)	3,768,123
Pima (2006)	662,127 (70)	29,119 (3.1)	22,866 (2.4)	1,528 (0.2%)	230,182 (24.3)	307,625 (32.5%)	946,362
Pinal (2006)	190,445 (70.3)	9,166 (3.4)	3,442 (1.3)	NR	68,006 (25)	80,035 (25.1%)	271,059
Santa Cruz (2000)	29,168 (76.0)	145 (0.4)	201 (0.5)	NR	8,867 (23.1)	31,005 (80.8%)	38,381

Source: USCB 2000, USCB 2006a, b, c, d, and e
NR = None reported

3.18.2 Employment and Income

Table 3-22 summarizes the total number of jobs in the study area split by county. Maricopa County had the largest numbers of jobs in the ROI while Santa Cruz had the lowest. Santa Cruz County had the highest unemployment rate (7.7 percent) followed by Pinal County (5.0 percent). Maricopa County (3.5 percent) and Pima County (4.0 percent) were both below the state unemployment rate (Arizona Department of Economic Security (ADES) 2006).

Table 3-22. Total Number of Jobs and Unemployment Rate within the Area of Operations

Location	1995	2005	Percent Change (percent)	Unemployment Rate ¹ (percent)
Arizona	2,275,033	3,237,202	42	4.1
Cochise	45,316	58,141	28	4.5
Maricopa	1,469,468	2,188,301	29	3.5
Pima	384,604	486,165	36	4.0
Pinal	50,455	59,809	18	5.0
Santa Cruz	14,507	17,398	31	7.7

Source: Bureau of Economic Analysis (BEA) 1995a,b,c, d, e, and f and BEA 2005a, b, c, d, e, and f; ADES 2006
¹ for the year 2006

Table 3-23 summarizes the total personal income (TPI) for the ROI. TPI ranged from to \$839 million in Santa Cruz County \$57 billion in Maricopa County. The average annual growth rate over the past 10 years ranged from 9.3 percent in Pinal County to 5.8

percent in Santa Cruz County. The average annual growth rate of TPI for the U.S. was 5.3 percent (USCB 2005). Two counties within the ROI were below the average annual growth rate for TPI within Arizona (Bureau of Economic Analysis [BEA] 2005f, g, h, i, and j).

Table 3-23. Total Personal Income for the Region of Influence

Location	1995 TPI (rank) (in \$ billions)	2005 TPI (rank) (in \$ billions)	Percent State Total (percent)	Average Annual Growth Rate (percent)
Arizona	\$88 (23rd)	\$181 (21st)	100	7.4
Cochise	\$1.7 (8 th)	\$3.4 (8 th)	1.9	6.8
Maricopa	\$57 (1 st)	\$121 (1 st)	67.6	7.7
Pima	\$14.8 (2 nd)	\$26.7 (2 nd)	14.9	6.1
Pinal	\$2.1 (5 th)	\$5.0 (3 rd)	2.8	9.3
Santa Cruz	\$0.48 (12 th)	\$0.84 (12 th)	0.5	5.8

Source: BEA 2005g, h, i, j, k, l

Per capita personal income (PCPI) data for the ROI is located in Table 3-24. PCPI ranged from \$33,178 in Maricopa County, Arizona to \$19,967 in Santa Cruz County. All the counties were below the National average of \$34,471 with Maricopa County being the closest at 96 percent of the National average PCPI. The average annual growth rate of PCPI ranged from 4.1 percent in Maricopa and Pima counties to 3.9 percent in Pinal and Santa Cruz counties. The annual average growth rate of PCPI in Pinal and Santa Cruz counties were below the average annual growth rate of the Nation (4.1 percent). The annual average growth rate across the ROI, except in Cochise County, was below the average annual growth rate of the state (4.3 percent) (BEA 2005f).

Table 3-24. Per Capita Personal Income for the Region of Influence

Location	1995 PCPI (rank)	2005 PCPI (rank)	Percent of State Average (percent)	Percent National Average (percent)	Average Annual Growth Rate (percent)
Arizona	\$19,929 (36th)	\$30,384 (38th)	--	88	4.3
Cochise	15,582 (8 th)	\$26,866 (4 th)	90	78	5.6
Maricopa	\$22,107 (1 st)	\$33,178 (1 st)	111	96	4.1
Pima	\$19,275 (2 nd)	\$28,869 (2 nd)	96	84	4.1
Pinal	\$14,109 (10 th)	\$20,835 (10 th)	69	60	3.9
Santa Cruz	\$13,597 (12 th)	\$19,967 (12 th)	67	58	3.9

Source: BEA 2005g, h, i, j, k, and l

3.18.3 Housing

The total number of housing units in the ROI in 2006 was 1,983,973 (assuming the number of Santa Cruz housing units did not decrease since 2000). Table 3-25 summarizes the total number of housing units by county. The largest number of housing units is located in Maricopa County while the smallest is located in Santa Cruz County. Santa Cruz and Pima counties have the smallest percentage of vacant units, while Pinal County has the largest percentage of vacant housing units.

Table 3-25. Housing Units by County (2006)

Location	Vacant Housing Units (percent)	Occupied Housing Units		Total Housing Units (percent)
		Owner (percent)	Renter (percent)	
Arizona	380,103 (15)	1,523,041 (68)	701,951 (32)	1,983,973
Cochise	7,517 (13.4)	34,226 (70)	14,492 (30)	56,235 (2)
Maricopa	174,125 (12)	898,278 (68)	423,826 (32)	1,496,229 (57)
Pima	46,843 (11)	244,915 (66)	126,455 (34)	418,213 (16)
Pinal	21,701 (17)	81,036 (77)	23,968 (23)	126,705 (5)
Santa Cruz*	1,227 (9)	8,026 (68)	3783 (32)	13,306 (NA)

Source: USCB 2000, USCB 2006a, b, c, d, and e

* For the year 2000

NA – Because Santa Cruz data is from 2000, it is not compared to 2006 Arizona total housing units.

3.18.4 Environmental Consequences

3.18.4.1 No Action Alternative

Under the No Action Alternative, construction of towers would not take place. As a result, no direct impacts would be anticipated under the No Action Alternative. However, the current illegal pedestrian and vehicle traffic and other illegal activities would continue and probably increase, likely resulting in an increase in insurance costs, property losses, law enforcement expenses, and other social costs (e.g., drug rehabilitation, medical expenses, and labor opportunities). The No Action Alternative would continue to endanger the lives and increase health risks to ICs attempting to cross the southern border and the safety of CBP agents who attempt to apprehend them.

Population and Demographics

No changes would occur to population and demographics from the No Action Alternative.

Employment and Income

Employment and income would not be affected by No Action Alternative.

Housing

No displacement of residential or commercial properties would result under the No Action Alternative.

3.18.4.2 Proposed Action

In general, all construction activities, regardless of the area, would be limited to daylight hours only, to the maximum extent practicable. Overall, only minor direct impacts on housing or employment in the project areas would result from temporary, short term increases in the tower construction workforce that would last for the approximate 10- to 60-day construction work schedule. No changes to local employment rates, poverty levels, or local incomes would occur as a result of this program. Long term, but minor, beneficial socioeconomic impacts would be realized from the purchasing of liquid propane gas locally to power up to 54 towers and future maintenance of tower projects.

The increased surveillance and improved CBP response times to apprehend ICs would reduce illegal traffic in the project area. ICs have been associated with increased reports of car thefts, prowlers, break-ins, and other illegal activities (Orrenius P.M. and Coronado R. 2005). Reductions in IC traffic resulting from increased surveillance from the implementation of the towers are expected to reduce crimes in the Casa Grande, Nogales, Phoenix, Sasabe, Sierra Vista, Sonoita, and Tucson areas and enhance the safety of U.S. residents.

Population and Demographics

The labor for the Proposed Action would be provided by private contractors, resulting in only temporary increases in the population of the project area.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on population. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Employment and Income

When possible, materials and other project expenditures would predominantly be obtained through merchants in the local community resulting in minor, temporary economic benefits.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on the economy. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

Housing

No displacement of residential or commercial properties would result from this action. Adequate housing and contracting resources are available in the ROI for private contractor involvement in constructing the proposed towers.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the proposed Ajo Station tower). Therefore, there would be no impacts on housing. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.19 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

3.19.1 Affected Environment

3.19.1.1 Executive Order 12898, Environmental Justice

The fair treatment of all races has been assuming an increasingly prominent role in environmental legislation and implementation of environmental statutes. In February 1994, President Clinton signed EO 12898 titled, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This action requires all Federal agencies to identify and address disproportionately high and adverse effect of its programs, policies, and activities on minority and low-income populations. Cochise, Maricopa, Pima, and Pinal counties have approximately 30 percent of their population claiming Hispanic or Latino origin (see Table 3-17). About 81 percent of Santa Cruz County claims to be of Hispanic or Latino origin (see Table 3-17). Furthermore, each of the counties is below both the National and respective state median household income and also has a greater percentage of all their populations in poverty relative to both Arizona and the Nation, except for Maricopa County (Table 3-26).

Table 3-26. Poverty and Median Income Data for the Nation, Arizona, and Across the ROI

Location	All Ages in Poverty, (percent)	Under Age 18 in Poverty, (percent)	Median Household Income
United States	13.3	18.5	\$46,242
Arizona	14.4	20.9	\$44,402
Cochise	16.9	24.3	\$36,296
Maricopa	12.6	18.3	\$48,752
Pima	14.9	21.5	\$41,484
Pinal	15.7	20.8	\$41,177
Santa Cruz	20.4	29.2	\$33,491

Source: USCB 2005

3.19.1.2 Executive Order 13045, Protection of Children

EO 13045 requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children”; and “ensure that its policies, programs, activities, and standards address disproportionate risks to children

that result from environmental health risks or safety risks.” This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. In Cochise County, 7,587 individuals, or 24.3 percent of the population are children under the age of 18 that are at or below the poverty level (USCB 2005). In Maricopa County, 178,681, or 18.3 percent of the population are children under the age of 18 that are at or below poverty level (USCB 2005, see Table 3-24). Additionally, in Pima County, 47,294 individuals, or 21.5 percent of the population are children under the age of 18 that are at or below the poverty level (USCB 2005). In Pinal County, 11,524 individuals, or 20.8 percent of the population are children under the age of 18 living at or below the poverty level (USCB 2005). About 29 percent of the population of Santa Cruz County is children under the age of 18 living at or below poverty level (USCB 2005). The potential for impacts to the health and safety of children would be greater where projects are located near residential areas.

3.19.2 Environmental Consequences

3.19.2.1 No Action Alternative

Under the No Action Alternative, construction of towers would not take place. As a result, no impacts would be anticipated under the No Action Alternative for environmental justice issues.

3.19.2.2 Proposed Action

The Proposed Action would beneficially affect the five counties across the ROI, regardless of race and income level. The Proposed Action would not result in disproportionately high or adverse environmental health or safety impacts on minority or low-income populations or children. This conclusion is based on the fact that the analyses in this EA have identified no significant adverse environmental effects for any resource area or population (minority, low-income, children, or otherwise) as a results of implementing the Proposed Action.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on environmental health or safety impacts on minority or low-income populations or children. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

3.20 SUSTAINABILITY AND GREENING

3.20.1 Affected Environment

In accordance with EO 13423 – Strengthening Federal Environmental, Energy, and Transportation Management (72 FR 3919 [2007]), CBP would 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 would 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.

3.20.2 Environmental Consequences

3.20.2.1 No Action Alternative

The No Action Alternative would not result in any direct or indirect impacts, as no construction activities would take place.

3.20.2.2 Proposed Action

Under the Proposed Action, the Federal sustainability and greening practices would be implemented to the greatest extent practicable.

No construction of access roads and towers, foundations, and associated buildings are required for the retrofits or upgrades to the 12 existing towers (including the one proposed Ajo Station tower). Therefore, there would be no impacts on sustainability or greening. In the case of TCA-AJO-305, it has been previously analyzed as having no significant impacts (CBP 2007b).

CBP intends to obtain the goal of reducing petroleum-based product use with a Fleet Management Plan facilitated through CBP's Asset Management Division. This project would adhere to this management plan.

SECTION 4.0
CUMULATIVE IMPACTS

4.0 CUMULATIVE IMPACTS

The NEPA regulations define cumulative impacts as an “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future projects within the Proposed Action areas. Projects were identified for this analysis by reviewing CBP documents, news/press releases and published media reports, and through consultation with planning and engineering departments of local governments, and state and Federal agencies, including DHS/CBP/SBI and *SBI_{net}* project proponents. Projects not planned in proximity to the proposed tower sites would not contribute to cumulative impacts within the project area and were not considered. Since the ROI for the proposed tower locations is Maricopa, Pima, Santa Cruz, Pinal, and Cochise counties, Arizona, the following analyses will address cumulative impacts only within the western portion of Tucson Sector.

4.1 REASONABLY FORESEEABLE CBP PROJECTS WITHIN AND NEAR THE TUCSON SECTOR

CBP has been conducting law enforcement actions along the U.S.-Mexico border since its inception in 1924, and has continually transformed its methods as new missions, IC modes of operations, agent needs, and National enforcement strategies have evolved. Development and maintenance of training ranges, station and sector facilities, detention

facilities, and roads and fences have affected thousands of acres with synergistic and cumulative impacts on soil, wildlife habitats, water quality, and noise. Beneficial effects have resulted from the construction and use of these roads and fences, including but not limited to: increased employment and income for border regions and surrounding communities, protection and enhancement of sensitive resources north of the border; reduction in crime within urban areas near the border; increased land value in areas where border security has increased; and increased knowledge of the biological communities and pre-history of the region through numerous biological and cultural resources surveys and studies.

With continued funding and implementation of CBP's environmental conservation measures, including environmental education and training of its agents, use of biological and archaeological monitors, wildlife water systems, wildlife forage plots, and restoration activities, adverse impacts of future and on-going projects would be prevented or minimized. However, recent, on-going, and reasonably foreseeable proposed projects will result in cumulative impacts. In particular, within the year, 225 miles of primary pedestrian fence are scheduled to be completed along the southwest border. The first phase of construction occurred in areas that had already been developed (e.g., currently contain permanent or temporary vehicle barrier); thus, little or no additional environmental impact was incurred. The second phase of construction is planned in more remote areas and will inevitably result in cumulative impacts. Construction for the primary pedestrian fence has been completed or is on-going in Texas, New Mexico, Arizona, and California. A list of the past, on-going, and other proposed CBP projects within the ROI surrounding the Tucson Sector is presented in Table 4-1.

Another CBP initiative, entitled Vehicle Fence 300 (VF 300), is planned at locations (as much as 300 miles) along the southwestern border where vehicle fence is the preferred fence design. While still in the planning stages, areas within the Tucson Sector that have been identified as potential projects include the Poza Verde Mountains to the west

of the ROI, portions of the CNF east and west of Nogales and areas in eastern Arizona near the Arizona-New Mexico state line.

Table 4-1. Recently Completed or Reasonably Foreseeable CBP Projects within and near the Tucson Sector

Project	Approximate Acres Permanently Impacted
Leased an 80-acre parcel of land near the Mariposa POE for CBP operations (portable lights and maintenance of roads), Nogales Station	80
Installation of a total of 7 miles of pedestrian fence and maintenance road east and west of the Sasabe, Arizona POE.	51
Installation of an underground fiber optic cable within the maintenance road footprint which parallels the U.S.-Mexico border near Sasabe, Pima County, Arizona.	0
Proposed construction and maintenance of approximately 11.7 miles of all-weather roads, which includes 8.5 miles of drag roads, low-water crossings, and drainage structures on either side of Nogales	40
Restoration of Ephraim Ridge near Nogales	1
Construction and improvement of 3 miles of new patrol road, including 0.3 mile of drag road, low-water crossings, and drainage structures west of the Mariposa commercial Port of Entry (POE) in the Tucson Sector, Nogales Station's AOR.	37
Expansion of CBP checkpoint facilities near Three-Points	5
Construction of 2.4 miles of primary fence, starting approximately 0.5 mile west of the Mariposa POE at the west end of the existing primary fence, and extending 2.4 miles westward. A maintenance road would be constructed for fence construction and maintenance.	18
Proposed placement of temporary vehicle barrier at up to 21 different locations (approximately 37 miles) along the U.S.-Mexico border within the Tucson, Nogales, and Sonoita Stations' AOR	0
Relocation of Nogales Interstate 19 (I-19) checkpoint	1
Construction of primary pedestrian and vehicle fence starting 1 mile east of the DeConcini POE and extending eastward for a total of 7.6 miles. An approximate 1.34 miles long road will be constructed along the border to allow installation and maintenance of this fence.	116
Installation of 15 remote video surveillance systems in the Nogales Station's AOR	2
Installation of a relay tower at Crawford Hill in the Nogales Station's AOR	0.1
Construction and improvements to 3 miles of CBP patrol roads and drag roads west of the Mariposa POE	37

Table 4-1, continued

Construction of 2.4 miles of primary fence and maintenance road west of the Mariposa POE in Nogales, Arizona	18
Realignment of 0.25 miles of patrol road over Limestone Ridge and construction of 3 miles of primary fence near Limestone Ridge	52
Realignments to 0.34 mile of all-weather patrol road and relocation of 55 permanent lights east of the DeConcini POE	24
Proposed tower construction and access roads for SBInet Tucson East project	5*
Proposed tower construction and access roads for SBInet Organ Pipe Cactus National Monument project	20*
Proposed tower construction and access roads for SBInet T'Ohno Odham project	3*

* These are only initial planning estimates based on tower impacts and currently does not include roads.

Other SBInet tower projects are currently in the planning phase for Arizona and would include tower construction and access roads in the Naco, Douglas and Willcox AORs (Tucson East, 29 towers proposed), Organ Pipe Cactus National Monument (12 proposed towers), and Tohono O'odham Nation (17 proposed towers). The number of proposed towers for these projects may change based on the development of final planning and analysis designs.

In addition to these phased projects, CBP might be required to implement other activities and operations that are currently not foreseen or not within the ROI and therefore not discussed in this document. These actions could be in response to national emergencies or security events like the terrorist attacks on September 11, 2001, or to changes in the mode of operations of potential ICs.

4.2 OTHER AGENCY/ORGANIZATIONS PROJECTS

Plans by other agencies that would also affect the region's natural and human environment include various road improvements by ADOT and/or Santa Cruz County. The majority of these projects would be expected to occur along existing corridors and/or within previously disturbed sites. The magnitude of the impacts would depend upon the length and width of the road right of way (ROW) and the extant conditions within and adjacent to the ROW.

Several ADOT projects were identified for the next 5 years. The details of these projects are incorporated herein by reference. Following is a summary of the types of ADOT projects currently in the planning stage:

- Country Club Road-Ruby Road – design of frontage roads
- U.S.-Mexico border – Business I-19 roadway improvements
- Junction of State Route-189 and I-19 – roadway improvements
- Doe Street to Baffert Drive – retrofit, sidewalks, landscaping
- Patagonia Lake/Sonoita Creek – design planning
- State Route-82 between Mileposts 38 and 39.5 – slope flattening
- State Route-189 at Milepost 0.095 – drainage improvements
- Mariposa POE – parking lot and road improvements

ADOT planned improvements for Cochise, Pima, Santa Cruz, and Maricopa counties, through 2009 are:

- SR 90 to Ocotillo TI reconstruct and lane addition (ADOT 2007);
- Tombstone Courthouse State Park construct parking (ADOT 2007);
- Central Avenue to Moson Road, East of Sierra Vista widen to 4 lanes (ADOT 2007);
- Carr Canyon Road to Hunter Canyon widen to 4 lanes (ADOT 2007);
- Ideal Draw Stream # 5098 bridge scour project (ADOT 2007);
- Cochise SPRR bridge Replacement (ADOT 2007);
- I-10 Prince Road to 29th Street reconstruct and widen roadway (ADOT 2007);
- I-10 Pinal Air Park Road to Tangerine Road widening (ADOT 2007); and
- I-10 Picacho Peak Road to Pinal Air Park Road widening (ADOT 2007).

In addition, projects are currently being planned by other Federal entities which could affect areas in use by CBP. CBP should maintain close coordination with these agencies to ensure that CBP activities do not conflict with other agencies' policies or management plans. CBP would consult with applicable state and Federal agencies prior to performing any construction activities and would coordinate operations so that they do not inappropriately impact the mission of other agencies. The 2007 Ajo Station EA provided an extensive list of past or foreseeable Federal projects within the region. These projects are also incorporated herein by reference (CBP 2007b). Other

agencies, such as BLM, U.S. Air Force, NPS, and USFS, routinely prepare or update Resource Management Plans for the resources they manage. USFS has the responsibility of managing approximately half of all lands within Santa Cruz County. In addition to general rangeland management, the types of projects conducted by USFS include:

- lake maintenance projects;
- pasture divisions and grazing allotment management plans;
- fuelwood/hazardous fuel reduction plans;
- specific habitat improvement projects;
- facility planning;
- invasive exotic plant management programs;
- land exchanges;
- pipeline/transmission ROWs; and
- mechanical brush control plans.

Nogales is the designated gateway from and to Mexico on the CANAMEX Trade Corridor. The name "CANAMEX" is derived from the country names of Canada, America, and Mexico, where a western trade corridor of 1,700 miles of existing highway and interstate systems connects the three countries. The CANAMEX corridor would likely become one of the most important north/south trade corridors in North America. The state governments of Arizona and Nevada are committed to obtaining funds to construct a four-lane divided highway in anticipation of the CANAMEX Trade Corridor. The completion of these projects would create an uninterrupted north/south highway system down the spine of the CANAMEX Trade Corridor. This project is in the planning stage, and potential impacts are unknown at this time.

CBP activities have had many positive cumulative impacts. For example, construction and maintenance activities resulting in reductions in illegal drug smuggling have had cumulative positive impacts on socioeconomic resources within the border area. INS (now CBP) activities completed from 1994 to 1999 have provided information on over 100 new cultural resources sites potentially eligible for NRHP listing.

A summary of the anticipated cumulative impacts of the Proposed Action (*i.e.*, construction of 54 towers in the western portion of the Tucson Sector) is presented in the following sections. Discussions are presented for each of the resources described previously.

4.3 IDENTIFICATION OF CUMULATIVE EFFECTS ISSUES

4.3.1 Water, Soils, and Air

The pollution of water, soils, and air resulting from independently small actions can have additive and synergistic effects on single resources, ecosystems, and human communities when combined with the cumulative effects of similar actions in a region.

The effects of water pollution on wildlife, sensitive fish, migratory birds, Santa Cruz, San Pedro, and Gila River riparian communities and the Sonoran Desert ecosystem have been significant. Water quality in the river basins is affected by agricultural development. Planned and existing improvements to agricultural practices can reduce pollutants and reduce effects on resources ecosystems, and human communities. The Proposed Action and other similar development actions would most likely occur on agricultural lands or government managed lands, primarily because the majority of the project corridor is either under agricultural production or Federal management.

Each new residential or commercial development action in the southeastern Arizona river basins would likely implement mitigation measures to reduce the potential effects of pollutants associated with the handling of POLs, VOCs, and hazardous materials. Each new development would also likely comply with wastewater treatment regulations, and most would probably connect to the existing wastewater treatment system. Therefore, the point- and non-point sources of pollution created by the Proposed Action and other similar developments would not result in cumulative effects.

The topography of southeastern Arizona creates the potential for increased soil loss; however, each new development would likely be incorporated into local and regional

SWPPPs. The pollution of soils, which can synergistically affect other resources and ecosystems, would also be mitigated through use of a SWPPP and associated BMPs. Therefore, the cumulative effects of the Proposed Action, when combined with other similar developments, would be minimal.

4.3.2 Floodplains

Most of the 100-year floodplain in Cochise, Maricopa, Pima, and Santa Cruz counties is occupied by rangeland, agricultural lands, and Federal and state lands; and minimal development has occurred within the floodplain. The Proposed Action and other developments are not expected to result in substantial impacts to the 100-year floodplain. Federal and local laws governing floodplains limit development within the 100-year floodplain. Therefore, there is no potential for the Proposed Action, when combined with other similar developments, to cumulatively affect floodplains, wildlife, or wildlife habitats.

4.3.3 Vegetation Communities and Wildlife

Much of the tower sites are located in Arizona Upland and Lower Colorado River Subdivisions, Plains and Great Basin and Semidesert Grasslands, and Madrean Evergreen Woodland vegetation communities. The Proposed Action and other similar developments are not expected to result in substantial new development of previously undisturbed lands. The majority of the project area is currently undisturbed. The Proposed Action would have negligible effect on vegetation and wildlife (41 acres total) and would not create additional opportunities for the spread of invasive plants and noxious weeds. Therefore, there is a minimal potential for the Proposed Action, when combined with other similar developments, to cumulatively affect vegetation or wildlife habitats.

4.3.4 Sensitive Species

The Proposed Action would permanently affect 41 acres, therefore, there is a minimal potential for the Proposed Action, when combined with other similar developments, to cumulatively affect sensitive species. With the implementation of mitigation measures

described in Section 5, most adverse affects to sensitive species would be avoided. Species for which the implementation of conservation measures would completely avoid any adverse effect, or would minimize the potential for effect to an insignificant discountable level, include the Gila topminnow, Sonoran chub and Critical Habitat, Chiricahua leopard frog, Sonoran tiger salamander, masked bobwhite, yellow-billed cuckoo, and Huachuca water umbel and Critical Habitat. Therefore, the Proposed Action would not have a cumulative impact on these species when compared with other projects in the region.

Construction of tower site TCA-NGL-211 would occur within 1 mile of a Mexican spotted owl PAC; therefore, the adverse effects of habitat loss would not be avoided at this site. Furthermore, some primary constituent elements of Mexican spotted owl Critical Habitat would be affected by new tower sites and access roads. Other land disturbing projects in the region, that remove primary constituent elements of Mexican spotted owl Critical Habitat would be expected to have a cumulative impact on the Mexican spotted owl and designated Critical habitat. As all of the designated Critical Habitat for the Mexican spotted owl is on USFS lands, projects on these lands would have to be coordinated under Section 7 of the ESA. Potential adverse impacts to the Mexican spotted owl and its designated Critical Habitat would be reduced through the development of conservation measures during Section 7 consultation.

Pima pineapple cactus was observed at two tower sites and impacts are likely to be unavoidable. Other land disturbing projects in the region would be expected to have a cumulative impact on the Pima pineapple cactus. As most of the land in the region is Federally owned land, projects on these lands would have to be coordinated under Section 7 of the ESA. Potential adverse impacts to the Pima pineapple cactus has been reduced through the development of conservation measures during Section 7 consultation.

4.3.5 Cultural Resources

Much of the land within the immediate vicinity of the tower sites and access roads is located on Federal lands and all actions on these lands will require NEPA compliance and Section 106 compliance. Consequently the impacts to cultural resources would be avoided and or impacts to cultural resources would be mitigated through appropriate measures. Future developments are expected to conduct surveys and assess the potential for impacts to cultural resources if a Federal action (including financial aid or assistance, permits, or land) is required.

4.3.6 Land Use and Socioeconomics

Although the Proposed Action would affect only 41 acres, other future developments could cumulatively affect increase affects to agricultural lands, and rangelands within the ROI. As the cities of Nogales, Casa Grande and Tucson continue to grow, there is limited expansion potential to the south (due to the International Border), to the west (due to the Tohono O'odham Nation, OPCNM, and CPNWR). Consequently, the only real opportunity for future development in Nogales and Sonoita is to the east and for Tucson and Casa Grande to the east and south. Both could affect agricultural and rangelands that comprise the majority of the project region. Therefore, land use was analyzed.

As additional development and expansion occur, demands on transportation routes are expected. New highways or increased capacity (*i.e.*, widening) of existing highways would be required. These highways would be planned, designed and constructed to accommodate existing and future traffic demands, in accordance with ADOT and FHWA standards. The Proposed Action would add only about two vehicle trips per month to these demands and therefore, would not be a cumulative impact issue for further analysis.

Other socioeconomic/human resources, including noise, aesthetics, local economy, and housing have been impacted by past and on-going development. Future development would result in cumulative adverse and beneficial impacts to these conditions.

However, the Proposed Action would have only temporary and negligible impacts on the human environment.

4.4 DEFINING CUMULATIVE EFFECTS ASSESSMENT GOALS

Three cumulative effects issues, two resource related (cultural and aesthetics) and one related to human communities (land use), have been identified as potentially substantial. These issues are inter-dependent since cultural resources, aesthetics and land use will be affected primarily by urban development. Ultimately, the construction, upgrade, operation and maintenance of the proposed towers represent a minimal proportion of the planned and reasonably foreseeable growth in southern Arizona, which would occur regardless of the action implemented by CBP. Therefore, relative to the baseline conditions (*i.e.*, No Action Alternative), implementation of the Proposed Action would have a minimal cumulative effect on air quality, cultural resources or land use.

4.5 SUMMARY OF OTHER PROJECTS CONTRIBUTING TO CUMULATIVE EFFECTS ISSUES

The following sections describe current and proposed actions by CBP and other entities which, when combined with the Proposed Action, could result in cumulative impacts to the natural and human environment.

4.6 CUMULATIVE ENVIRONMENTAL EFFECTS

4.6.1 Proposed Action

A summary of the anticipated cumulative impacts relative to the Proposed Action (*i.e.*, construction, upgrade, operation and maintenance of 54 tower sites) is presented below. These discussions are presented for each of the resources described previously.

4.6.2 Land Use

The Proposed Action would affect approximately 41 acres of undeveloped land and developed/disturbed lands. The construction and operation of the towers would not conflict with any known land use plans, and would not substantially alter the availability of farm or rangelands in the region. The Proposed Action will also not conflict with resource management plans on CNF or BANWR. To ensure no conflicts exist, Federal land managers are required to complete an appropriate use test or compatibility assessment for the proposed project to occur on their lands. CBP will coordinate with the appropriate resource agencies to assist in such assessments or tests. CBP is coordinating with USFWS regarding the tower sites that are proposed for the BANWR. Additionally, construction of the BANWR tower sites is contingent upon a USFWS determination that they are appropriate and compatible uses for the BANWR. This action, therefore, is not expected to result in significant cumulative adverse effects when considered with other potential changes of land use.

4.6.3 Air Quality

Emissions generated during and after construction of the towers and access roads would be short term and minor. Although maintenance of the towers and repair and improvements of access roads would result in minor cumulative impacts to the region's air shed, these impacts would not be considered significant even when combined with other proposed developments in the border region of Arizona. Liquid propane gas generators would be used only sporadically and emissions from these generators would be negligible. Deterrence of, and improved response time to, ICs created by the operation of the towers are anticipated to reduce off-road enforcement actions currently required by CBP agents.

4.6.4 Aesthetics

No major cumulative impacts to visual resources would occur from implementing the Proposed Action, due in part to the small footprint of the towers and access roads, and the large amount of agriculture, rangeland, evergreen forestland, and border infrastructure that exists within vicinity of the proposed project area. The tower site

selection process placed as many towers as possible in previously disturbed or developed areas, at existing communications or remote video surveillance tower locations (also called RVS towers), or at existing CBP facilities. The relatively low tower heights and the lack of guy wires could also alleviate the potential for the proposed project to obstruct aesthetic vistas or otherwise impact visual resources of the project area. Additionally, the proposed towers would be constructed at least 5 to 10 miles apart. So, depending on topography, no single viewshed would be impacted by more than one or two towers. As much of the tower area is within Federal lands, the proposed project will also comply with Federal agency guidelines. Construction, upgrade, operation, and maintenance of the proposed towers, when considered with existing and proposed developments in the surrounding area, would not result in significant cumulative impacts to the visual quality of the region.

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SECTION 5.0
MITIGATION MEASURES

5.0 MITIGATION MEASURES

It is CBP's policy to reduce impacts through a sequence of avoidance, minimization, mitigation, and compensation. This chapter describes those measures that would be implemented to reduce or eliminate potential adverse impacts to the human and natural environment. Many of these measures have been incorporated as standard operating procedures by CBP on past projects. Environmental design measures are presented for each resource category potentially affected. These are general mitigation measures; development of specific mitigation measures would be required for certain activities implemented under the Proposed Action. The specific mitigation measures would be coordinated through appropriate agencies and land managers or administrators, as required. Mitigations vary and include activities such as restoration of habitat in other areas, acquisition of lands, implementation of BMPs, and are typically coordinated with the USFWS and other appropriate Federal and state resource agencies.

5.1 PROJECT PLANNING/DESIGN COMMUNICATION AND WIND TOWERS

The following measures were adapted from our *Interim Guidance on Siting, Construction, Operation, and Decommissioning of Communication Towers* (U.S. Fish and Wildlife Service 2000), *Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines* (U.S. Fish and Wildlife Service 2003) and the Arizona Game and Fish Department's (AGFD) *Wind Energy Development Guidelines* (AGFD 2006).

- CBP will minimize bird perching and nesting opportunities for new towers.
- CBP will not site towers in or near wetlands, other known bird concentration areas (e.g., state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. If this is not an option, mitigation will be required.
- Where CBP will be constructing taller (>199 feet above ground level) towers requiring lights for aviation safety, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA will be used (FAA 2000). 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.

- CBP will not use guy wires for tower support to reduce the probability of bird and bat collisions.
- CBP will use security lighting for on-ground facilities and equipment that is down-shielded to keep light within the boundaries of the site.
- CBP will site, design, and construct towers and appendant facilities to avoid or minimize habitat loss within and adjacent to the tower “footprint.” CBP will minimize road access and fencing to reduce or prevent habitat fragmentation and disturbance, and to reduce above-ground obstacles to birds in flight.
- When ridges, canyons, cliffs, and fissures are within the project vicinity, CBP will offset wind turbines at least 150 feet from the geologic features. If turbine placement cannot be offset, CBP will mitigate effects. Ridges, steep slopes, valleys, canyons, cliffs, and fissures are usually areas of concentrated wildlife, generally birds and bats.
- Unless site-specific key species behavioral observations indicate more optimal tower and blade dimensions, CBP will place turbines inside the site perimeter fence with lower blade reaches at least 10 feet above ground and upper blade reaches no more than 40 feet high.
- CBP will use the minimum wind turbine blade rpm and will consider reducing the blade rpm during spring and fall bird migration, and nights. If the minimum turbine blade rpm cannot be used, CBP will mitigate effects.
- CBP will paint the ends of the wind turbine blades to minimize motion smear.
- 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 Avian Power Line Interaction Committee (1994, 1996) for any required above-ground lines, transformers, or conductors. CBP will use raptor protective devices on above ground wires.
- When upgrading or retrofitting turbines, CBP will follow the above guidelines as closely as possible. If studies indicate high mortality at specific turbines, CBP will relocate or retrofit turbines.
- CBP will control noxious weeds using approved herbicides.
- If rodent populations on the perimeter of the facility are to be controlled, CBP will not use rodenticides.
- CBP will develop a Fire Management Plan as part of tower construction and in coordination with the landowner and/or land management agency.
- CBP will develop and fund implementation of a long-term monitoring plan to document and assess tower related mortality of lesser long-nosed bats. This

monitoring plan, to be approved by USFWS, will be completed within six months of the biological opinion date. It will include systematic lesser long-nosed bat searches and use of radar, Global Positioning System (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. Information gained from implementation of this monitoring plan will be used to develop tower retrofits to reduce lesser long-nosed bat mortality, if collisions are documented.

- Once CBP has determined that towers are no longer needed, CBP will remove them within 12 months of cessation of use. CBP will restore footprint of towers and associated facilities to natural habitat.

5.2 PROJECT PLANNING/DESIGN – GENERAL

For each project, CBP will either assume presence of a Federally-listed species based on suitable habitat or known presence, and implement appropriate measures or will, as part of project design and planning, perform pre-construction surveys according to established standardized protocols.

CBP will develop (in coordination with USFWS) 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.

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

CBP will give particular importance to proper design and locating roads such that the potential for road bed erosion into Federally listed species' habitat will be avoided or minimized.

CBP will give particular importance to proper design and locating roads such that the potential for entrapment of surface flows within the roadbed due to grading will be avoided or minimized. Depth of any pits created will be minimized so animals do not become trapped.

CBP will give particular importance to proper design and locating roads such that the widening of existing or created roadbeds beyond the design parameters due to improper maintenance and use will be avoided or minimized.

CBP will give particular importance to proper design and locating roads such that excessive use of unimproved roads that results in their deterioration such that it affects the surrounding Federally listed species habitat areas will be monitored, corrective maintenance provided, and documented in the Project Report.

CBP will give particular importance to proper design and locating roads such that the fewest roads needed for proposed actions will be constructed to proper standards. In concurrence with the landowners and/or land management agency, once CBP determines that access roads constructed as part of this proposed action are no longer needed for the purpose of this project, CBP will close and restore access roads to natural surface and topography using appropriate techniques. The GPS coordinates of roads that are thus closed will be recorded and integrated into the CBP Geographic Information System (GIS) database. A record of acreage or miles of roads taken out of use, restored, and revegetated will be maintained.

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 sub-watershed. This strategy will include, but is not limited to participation in or coordination with, the Upper San Pedro Partnership and/or its member agencies.

CBP will develop and implement a stormwater management plan (SWMP or stormwater pollution prevention plan [SWPPP]). Erosion control measures and appropriate Best Management Practices (BMP), 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.

CBP will prepare a site restoration plan, to be approved by USFWS. This site restoration plan will be developed within four months of the date of this project's biological opinion 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.

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.

CBP will document any establishment of non-native plants and will implement appropriate control measures.

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. Vehicles carrying UGS will stay on authorized roads. UGS will be hand carried to deployment location.

CBP will ensure that all construction will follow DHS Environmental Planning Management Directive 5100 for waste management.

A CBP-approved spill protection plan (or SPCCP) 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. Drip pans underneath equipment, containment zones used when refueling vehicles or equipment, and other measures are to be included.

CBP will incorporate BMPs relating to project area delineation, water sources, waste management, and site restoration into project planning and implementation for road construction and maintenance.

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 feet 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.

5.3 GENERAL CONSTRUCTION ACTIVITIES

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.

CBP will construct and maintain the fewest roads needed, using proper standards.

The width of all roads that are created or maintained by CBP will be measured and recorded using GPS coordinates and integrated into the CBP GIS database. Maintenance actions will not increase the width of the 12-foot road bed or the amount of disturbed area beyond the 12-foot road bed.

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.

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.

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 will not use surface water from aquatic or marsh habitats for construction purposes if that site supports aquatic Federally listed species or if it contains non-native invasive species or disease vectors and there is any opportunity to contaminate a Federally listed species habitat through use of the water at the project site.

CBP will not use surface water from untreated sources, including water used for irrigation purposes, for construction or maintenance projects located within one mile of

aquatic habitat for Federally listed aquatic species. Groundwater or surface water from a treated municipal source will be used when close to such habitats. This is to prevent the transfer of invasive animals or disease pathogens between habitats if water on the construction site was to reach the Federally listed species habitats.

CBP water tankers that convey untreated surface water will not discard unused water within two miles of any aquatic or marsh habitat.

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 on-ground 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 percent 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.

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.

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.

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 miles per hour (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.

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.

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

5.4 SOILS

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. 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. 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. Additionally, erosion control measures and appropriate BMPs, as required and promulgated through the SWPPP and engineering designs, will be implemented before, during, and after construction activities.

Road repair or improvements shall avoid, to the greatest extent practicable, creating wind rows with the soils once grading activities are completed. Excess soils from construction activities will be used on-site to raise and shape proposed tower sites and road surfaces.

5.5 VEGETATION

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.

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.

CBP will remove invasive plants that appear on the tower sites, along sections of repaired and new road. 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 avoid removal of riparian vegetation within 100 feet of aquatic habitats to provide a buffer area to protect the habitat from sedimentation.

5.6 WILDLIFE RESOURCES

The Migratory Bird Treaty Act (16 U.S.C. 703-712, [1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989]) requires that Federal agencies coordinate with the USFWS if a construction activity would result in the take of a migratory bird. 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, FAA, and AGFD will be required and applicable permits would be obtained prior to construction or clearing activities. Another mitigation measure that would be considered is to schedule all construction activities outside nesting seasons negating the requirement for nesting bird surveys. The proposed sensor and communication towers would also comply with USFWS guidelines for reducing fatal bird strikes on communication towers (USFWS 2000) 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.

Helicopter deployment would occur at one tower and may potentially occur at two other proposed tower sites. To reduce any possible impacts to wildlife, helicopter use should be limited to daylight hours and hovering should be avoided, to the greatest extent possible.

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.

5.7 PROTECTED SPECIES

Several BMPs have been identified to decrease any potential impacts to Federal and state protected species. Additional conservation measures and BMP are being developed as part of Section 7 consultation and CBP would adhere to those measures identified in the Biological Opinion:

- 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.
- 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. 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 and lesser long-nosed bat.

- Where a project could be located within one mile of occupied species habitats but the individuals of the species are not likely to move into the project area, a biological monitor is not needed during construction. However, the construction manager will be aware of the species location and ensure that BMPs designed to minimize habitat impacts are implemented and maintained as planned. This category includes the following species: all aquatic species.
- 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. This includes Chiricahua leopard frogs and Sonoran tiger salamanders.
- Construction equipment will be cleaned prior to entering and departing the project area to minimize the spread and establishment of non-native invasive plant species.
- Soil disturbances in temporary impact areas will be re-vegetated with native vegetation from nursery stock or seed.
- 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. In Pima pineapple cactus habitat, removal of topsoil is a permanent impact.
- Within the designated disturbance area, CBP will limit removal of trees and brush in Federally listed species habitats to the smallest amount needed to meet the objectives of the project. This type of clearing will likely be a permanent impact on habitat.
- 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.
- New roads created or improved by CBP will be located such that the potential for road bed erosion into Federally listed species habitat will be avoided or minimized.

- CBP will monitor, provide corrective maintenance, and document excessive use of unimproved roads that results in their deterioration such that it affects the surrounding Federally listed species habitat in the CBP Project Report.
- Facilities, including new roads, will maintain a distance of 0.5 mile from cienegas containing water umbel habitat.
- CBP actions with the potential to impact topminnow habitat will include coordination with involved land management agencies, landowners, and the AGFD and USFWS.
- CBP activities will maintain a distance of at least 0.5 mile away from known Gila topminnow and Sonora chub habitat.
- CBP activities including land clearing and tower implementation, will maintain a distance of 1,650 feet away from aquatic salamander habitat including stock tanks.
- New access roads to proposed tower sites will avoid routes which cross occupied threatened and endangered aquatic habitats.
- CBP will use established roads within the BANWR when executing activities which have the potential to impact areas occupied by masked bobwhite quail, or areas deemed to be high quality habitat.
- CBP activities occurring in suitable jaguar habitat will use existing roads to avoid further fragmentation of habitat, avoid constructing physical barriers that are impenetrable by jaguars in potential movement corridors.
- All contractors, work crews (including National Guard and military personnel), and CBP personnel in the field performing construction and maintenance activities will receive training. Training would provide information on the habitat and behavior of the specific sensitive species found in the area, including information on how to avoid impacts to these species resulting from construction and operational activities. It will be the responsibility of the construction project manager(s) to ensure that their personnel are familiar with general BMPs, the specific conservation measures presented here, and other limitations and constraints. In addition, training in identification of non-native invasive plants and animals should be provided for contracted personnel engaged in follow-up monitoring of construction sites.
- Road improvements would not widen any driving surface;
 - The removal of roadside vegetation would be limited to only those portions of plants necessary to allow the passage of vehicles, material, and equipment;
 - All access routes into and out of the disturbance area should be flagged, and no travel outside of those boundaries should be authorized;
 - Road repair or improvements shall avoid, to the extent practicable, 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;
- To the extent practicable, areas already disturbed by past activities or those that will be used later in the construction period should be used for staging, parking, and equipment storage;
 - The perimeter of all areas to be disturbed during construction should be clearly demarcated using flagging, and no disturbance outside that perimeter should be authorized;
 - The area to be disturbed should be minimized by limiting deliveries of materials and equipment to only those needed for effective project implementation;
 - Within the designated disturbance area, grading or topsoil removal should be limited to areas where this activity is needed to provide the ground conditions necessary for construction or maintenance activities;
 - Any vegetation removal outside the actual tower site should be minimized, and vegetation should be removed using hand tools or controlled by mowing; and
- The number of construction vehicles traveling to and from the project site and the number of trips per day will be minimized to reduce the likelihood of disturbing animals in the area or injuring an animal on the road. Construction speed limits should 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 should not exceed 25 mph, or less based on visibility and other safety considerations.
 - Transmission of disease vectors and invasive non-native aquatic species can occur if vehicles cross infected or infested streams or other waters and water or mud remains on the vehicle. If these vehicles subsequently cross or enter uninfected or noninfested waters, the disease or invasive species may be introduced to the new area. Between the Baboquivari Mountains and I-19, where the frog fungal skin disease, chytridomycosis (or Bd), is known to occur in Chiricahua leopard frog populations, CBP will take necessary precautions to minimize the likelihood of spreading Bd. In this area, CBP and its contractors will avoid contact with wetted areas. However, if vehicles or other equipment use will occur in wetted areas west of I-19 (including ponds, impoundments, or ephemeral or permanent streams) that equipment will be a) cleaned of mud and debris and then sprayed with a 10 percent bleach, 70 percent ethanol, or one percent quaternary ammonium solution, or b) allowed to dry completely, before moving to another wetted area. Treatments as just described will not be required for travel along Ruby Road or paved routes through the action area, as these routes are heavily traveled by the public and cleaning/sterilization of project vehicles will do little to prevent movement of disease via vehicular travel.

Species Specific Conservation Measures and BMPs

Chiricahua Leopard Frog - Project Planning

- CBP will design roads to minimize animal collisions and fragmentation of Federally listed populations. Exclusion fencing may be appropriate where road kill is likely or to direct species to underpasses or other passageways. Coordination with landowners and/or land management agencies will be necessary.
- CBP will investigate alternate routes to the TCA-TUS-040 tower site that do not pass by Upper Turner Tank or other occupied frog localities in the area. If such routes exist and are reasonable and appropriate to use, then the current proposed route that skirts Upper Turner Tank will not be used. If no alternate route is feasible or reasonable, then CBP will, prior to commencement of construction activities, erect a temporary frog barrier fence on the road shoulder between the access road and Upper Turner Tank, and extending 300 feet above and below the tank. The barrier will be temporary, and will be removed after all construction on TCA-TUS-040 and its associated access routes is completed. Although road mortality is anticipated after removal of the fence due to maintenance access and public use of the road, removal of the barrier is necessary to maintain connectivity between the Upper Turner Tank and Turner Tank populations.
- If new routes, or maintenance or improvement of existing routes will facilitate public movement towards, or access to, suitable breeding sites and such facilitation cannot be avoided, CBP will close them to the public and will post signs at nearby suitable breeding sites with pertinent regulations that protect the frog. Route closures and signs will be negotiated with landowners and/or land management agencies. CBP will monitor the effects to the frog's terrestrial and aquatic habitat. CBP will post and maintain a sign for the life of the proposed action at Upper Turner Tank that informs the public that fishing and stocking of non-native species at Upper Turner Tank is prohibited. CBP will coordinate with USFWS on the text and design of the sign.
- CBP will design all new roads to minimize the risk of erosion or adverse effects to aquatic habitats of the frog. Routes that cross seasonally or perennially flowing streams will be avoided. If not avoidable, crossings will be designed to minimize effects to streams through use of culverts or other design features that protect natural substrates and flows. New routes or improvement of routes leading to or near stock tanks and cienegas that provide suitable breeding habitat for frogs will be avoided, or they will be closed for administrative use only.

Chiricahua Leopard Frog - Construction/Maintenance

- Individual animals found in the project area and in danger of being harmed (e.g., in the path of vehicles or foot traffic) will be relocated by a biologist to a nearby safe location in accordance with USFWS Endangered Species Permit requirements.

- No handling, storage, or disposal of hazardous and regulated materials will occur within 0.3 mile of habitats potentially occupied by Chiricahua leopard frog.
- CBP will monitor Upper Turner and Summit Tanks for sedimentation and erosion from road use and repair during construction (TCA-TUS-40, TCA-NGL-045). Tank and road repair will be conducted in coordination with USFWS and landowner and/or land management agencies, if sedimentation or related effects are detected. CBP will use standardized methods for monitoring sedimentation.
- The on-site biological monitor will periodically check for mortality at and near Upper Turner Tank during construction activities. Results will be reported to USFWS in a written report no later than 90 days after completion of construction at tower TCA-TUS-040.

Chiricahua Leopard Frog - Post Construction

- CBP will complete a fencing, monitoring, and mitigation plan within six months of the date of this project's biological opinion for review and approval by landowners and/or land management agencies and USFWS. This plan will include methods and a schedule for fencing, bullfrog control, monitoring; the process for repair of fence, tank, and roads; and content and schedule for annual reports. The results of annual monitoring will be reported to USFWS annually in a written report due March 1. CBP will develop an Memorandum of Understanding (MOU) with the landowners and/or land management agencies to implement mitigation. 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. Implementation of this plan will begin once approved by USFWS and the land management agencies. Mitigation will be completed within five years of completion of tower construction. CBP will complete an annual report that summarize the implementation of all of the proposed actions, any incidental take that occurred, monitoring results, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.
- CBP will monitor Upper Turner and Summit tanks for sedimentation and erosion for three years following construction.
- CBP will monitor Upper Turner Tank for dead and dying frogs that may be killed by Bd or other amphibian diseases for three years following construction and once a year in February.
- CBP will remove the fence barrier after all construction on TCA-TUS-040 is completed to maintain connectivity between the Upper Turner Tank and Turner Tank populations.
- CBP will control non-native species, especially bullfrogs, at five aquatic sites west of I-19 for three years following construction to help offset the anticipated increase in access to occupied habitat in coordination with USFWS and landowners and/or land management agencies. The primary threat to Chiricahua leopard frogs in this area is predation by introduced American bullfrogs, which have well-established populations at Peña Blanca Lake, Ruby Lake, Arivaca

Lake, and several other permanent waters. CBP will focus mitigation efforts from Peña Blanca Lake west to Sycamore Canyon, where non-native control will benefit Chiricahua leopard frog populations. Where consistent with livestock operations, CBP will selectively fence ponds vulnerable to bullfrog invasion to exclude bullfrogs while allowing leopard frogs to leave the ponds. Where needed, a portion of each pond will be fenced to exclude livestock and allow for development of frog habitat. Monitor fenced habitat and take corrective actions if fences are breached and bullfrogs reinvade. CBP will coordinate a meeting with USFWS, landowners, and/or land management agencies within two months of the date of this project's biological opinion to determine where fencing and bullfrog control are needed.

- CBP will install pipe-rail wildlife-friendly fence and cattle guards to reduce public vehicle and cattle trespass in southwestern and northeastern corners of BANWR where frog habitat is likely to be impacted, as per refuge recommendations. CBP will monitor fence and repair fence if needed in cooperation with BANWR. CBP will complete a fencing plan within four months of the date of this project's biological opinion in cooperation with BANWR that includes design plans, installation schedule, monitoring plan, and a repair schedule.

Sonora Tiger Salamander - Project Planning

- CBP will design all new roads to minimize the risk of erosion or adverse effects to aquatic habitats of the salamander. Routes that cross seasonally or perennially flowing streams will be avoided. If not avoidable, crossings will be designed to minimize effects to streams through use of culverts or other design features that protect natural substrates and flows. New routes or improvement of routes leading to or near stock tanks that provide suitable breeding habitat for salamanders will be avoided, or they will be closed for administrative use only.

Sonora Tiger Salamander - During Construction/Maintenance

- Individual animals found in the project area and in danger of being harmed (e.g., in the path of vehicles or foot traffic) will be relocated by a biologist to a nearby safe location in accordance with USFWS Endangered Species Permit requirements.
- No construction or maintenance activities will occur within 0.1 mile of Sonora tiger salamander occupied habitat.
- Any use or storage of chemicals or fuels at construction sites or staging areas will be kept well away from suitable salamander sites. No storage of such chemicals or fuels will occur within 0.3 mile of salamander sites.
- No pumping of water from suitable breeding sites will occur for road maintenance, dust control, mixing concrete or other purposes. No transfer of water or mud among aquatic sites will occur.

Sonora Tiger Salamander – Post Construction

- Site restoration is not anticipated, but if impacts to salamander habitat occur, CBP will work with the landowner and/or land management agency to plan and implement restoration.
- CBP will implement other conservation measures for pesticides in and near salamander habitats (White 2004).

Mexican Spotted Owl - Project Planning/Documentation

- Roads, fences, security zones, surveillance sites, staging areas including tower sites, and other facilities that will require land clearing and will have associated noise and artificial light components will be at least 0.25 mile from any known PAC or CBP will mitigate (See *Post Construction* below). Firebreaks, fuels reduction, or other improved access for fire suppression will be incorporated, as appropriate in the placement of facilities. Facilities will not be located between nests and important forage areas such that movement between the two is compromised, or CBP will mitigate impacts.
- CBP will avoid new roads in the vicinity of PACs and other important habitat areas to reduce effects of human activity near PACs or CBP will mitigate impacts (See *Post Construction* below). Existing roads used by CBP to access new or existing facilities may need to be closed to other access to protect important owl habitat.

Mexican Spotted Owl - During Construction/Maintenance

- CBP will monitor:
 - a) 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.
 - b) Mexican spotted owl PACs where towers and increased human use may potentially affect owls and other areas where tower sites are within or less than 0.25 mile from a PAC.
- CBP will develop an MOU with the landowners and/or land management agencies to conduct spotted owl monitoring. USFWS will provide these PAC locations to CBP. Monitoring will be conducted by an experienced and Federally permitted spotted owl surveyor. All Mexican spotted owl disturbances will be documented in the CBP project reports. Corrective actions will be developed and implemented in coordination with USFWS and landowner and/or land management agencies, if effects are detected. The following tower sites or associated new access are inside of a PAC:
 - TCA-SON-062 (Joes Canyon PAC, Coronado National Memorial)
 - TCA-TUS-192 (Ski Valley PAC, Santa Catalina Mountains)

- TCA-NGL-211 (Cottonwood Canyon PAC, Santa Rita Mountains)
- 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.

Mexican Spotted Owl – Post Construction

- 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 landowners and/or land management agencies 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, and schedule and content of annual reports. PACs subject to monitoring and mitigation are listed in the bullets above. This plan will be completed in coordination with the landowner and/or land management agencies. CBP will develop an MOU with the landowners and/or land management agencies to implement mitigation. CBP will complete the monitoring and mitigation plan, in coordination with landowners and/or management agencies and USFWS, within six months of the date of this project's BO (September 4, 2008). Implementation of this plan will begin once approved by USFWS and the land management agencies and mitigation will be completed within three years from the date construction is completed and towers are fully operational. CBP will complete an annual report for a minimum of three years that summarizes the implementation of all of the proposed actions, monitoring results, mitigation progress, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.
- CBP will monitor affected Mexican spotted owl PACs annually for three years (field seasons) from the date construction is completed and towers are fully operational. CBP will develop an MOU with the landowners and/or land management agencies to conduct spotted owl monitoring USFWS will provide these PAC locations to CBP. Corrective actions should be developed and implemented in coordination with USFWS and landowner and/or land management agencies, if effects are detected. Corrective actions may include road closures, fencing, gating, and/or site restoration. Monitoring will be conducted by an experienced and Federally permitted spotted owl surveyor.
- CBP will provide sufficient funds to close unauthorized roads and restore habitat near affected Mexican spotted owl PACs in conjunction with USFS travel management planning. For every road repaired or created within 0.25 mile of a Mexican spotted owl PAC, CBP will close and/or restore the same length of road. CBP will update maps showing where improved or new roads were completed. CBP will complete a road closure/restoration plan. Mitigation will be completed within three years of the completion of construction.

Masked Bobwhite - Construction/Maintenance

- 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 in masked bobwhite habitat (BANWR), the November through July period is preferred.

Sonora Chub - Project Planning/Documentation

- Pre-construction surveys are not required for the Sonora chub. The species has been reliably and repeatedly detected within the Sycamore Canyon and California Gulch watersheds and its presence need not be confirmed.
- The minimum amount of vegetation will be cleared, and measures to control erosion off the construction site put into place. Roads, fences, and other facilities that will require land clearing, will be designed to avoid areas within 0.5 mile of Sycamore Canyon and California Gulch.

Jaguar - Project Planning/Documentation

- CBP will design roads to minimize animal collisions and fragmentation of jaguar habitat.

Jaguar - Post Construction

- CBP will complete a road closure/restoration plan for review and approval by landowners and/or land management agencies and USFWS that:
 - a) identifies and maps new roads where barriers will be placed to prevent public access,
 - b) identifies and maps unauthorized roads near potential jaguar movement corridors,
 - c) specifies that USFWS will use jaguar monitoring results to assist CBP in determining which unauthorized roads to close,
 - d) specifies potential road closure methods,
 - e) specifies potential restoration methods for closed roads,
 - f) includes a schedule for closure, and
 - g) includes a schedule and content of annual reporting.
- CBP will complete the road closure/restoration plan, in coordination with landowners and/or management agencies and USFWS, within six months of the date of this project's biological opinion. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed within six years of completion of the Tucson West tower project. CBP will complete an annual report until all Conservation BMPs for jaguars are completed. This report will summarize the implementation of the proposed

actions, number of miles closed and/or restored, restoration methods, effectiveness of road closures and restoration, camera monitoring results, and work plan for the following year.

- CBP will provide \$312,000 to monitor the effects of the proposed tower project on the jaguar. CBP will transfer this funding to the AGFD within six months of the completion of this project's BO, if it is determined that AGFD is the appropriate recipient for this purpose; otherwise the funding will be transferred to the USFWS. Funding will be used to monitor jaguar presence and movement along the border, and in additional mountain ranges and corridors within the action area. Funding will be used for camera traps, vehicles, supplies, and personnel. The results of this monitoring will be used to determine which unauthorized roads to close and to guide future project design.
- CBP will prevent public access of new roads through gating, physical barriers, fencing, *etc.*, in combination with appropriate signage and in coordination with the landowner and/or land management agencies. CBP will work with the land management agencies to determine the best method to prevent public access on new roads needing barriers. Blocking access will be achieved in a way that does not increase the probability that unauthorized roads will be created nearby.
- CBP will close and/or restore unauthorized roads (if approved by landowner) in or near jaguar movement corridors to help offset the increase in improved or new roads at a ratio of 2:1 (two miles of road closed and/or restored for every one mile of road created or repaired). This will require post construction quantification of (a) the number of miles of roads repaired and created, and (b) the area of new and repaired cut and fill. CBP will work with the land management agencies and USFWS to identify unauthorized roads for closure and determine the method most likely to prevent future access. Some road closures will require discing and seeding (using native species), in addition to placement of barriers. Closures will be achieved in a way that does not increase the probability that unauthorized roads will be created nearby.

Ocelot - Project Planning/Documentation

- See jaguar above under *Project Planning*. Although no monitoring or mitigation will be conducted for ocelots, camera traps for jaguars may also document ocelots.

Lesser long-nosed Bat - Project Planning/Documentation

- CBP roads, fences, security zones, surveillance sites, staging areas including tower sites, and other facilities that will require land clearing and have associated noise and high intensity artificial light components, will be located at least one mile from any known roost site or will be mitigated (see Post Construction below). The location of the facility will not be located between roosts and known foraging sites such that access between the two is compromised.

- CBP will avoid areas containing columnar cacti (saguaro, organ pipe) or agaves that provide the forage base for the bat or will mitigate effects (see *Post – Construction* below).
- During construction or maintenance activities in or within one mile of bat maternity roosts or known summer roosts (or such distance that noise, light, or other effects reach the habitat), a construction monitor with authority to halt construction at any time the appropriate Conservation BMPs are not being properly implemented as agreed to will be present on site.

Lesser long-nosed Bat - During Construction/Maintenance

- Construction activities for towers, new roads, and road improvements that are within one mile of a bat roost and occur between May 1 and September 30 will be monitored by a qualified biologist. In some years, bats may arrive earlier and leave later in the year than the May to September time frame. For maternity roosts this will be March through August. For summer roosts, this will be July through October. Any occurrences and/or disturbances of lesser long-nosed bats will be documented and mitigated (see *Post – Construction* below).
- 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.
- CBP will salvage and transplant agaves if they are less than 18 inches in diameter and columnar cacti less than six feet tall. Agaves that have flower stalks will not be salvaged/transplanted. A minimum of 12 to 18 inches of agave and cacti roots will be salvaged. Prior to removal, CBP will mark the orientation on each cactus to be transplanted. CBP will transplant columnar cacti in the same orientation they were removed to increase probability of survival. CBP will relocate plants at least 75 feet from the construction limits. CBP will not plant agaves or columnar cacti in active wash channels. CBP will follow guidelines identified in the Salvage Plan for CNM, dated May 22, 2008 (Coronado National Memorial 2008) and guidelines for salvage and transplanting columnar cacti available at <http://cals.arizona.edu/pubs/garden/az1376.pdf> (University of Arizona 2008) and <http://dbg.org/index.php/gardening/growingguides/ground/transplantingcactus> (Desert Botanical Gardens 2008). Plants will be watered according to site conditions.
- CBP will count agaves and columnar cacti removed for construction and will replace agaves and columnar cacti at a 2:1 ratio (for every plant removed, two will be replaced).

Lesser long-nosed Bat - Post Construction

- 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 BO. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed for a minimum of five years from the date all towers within the project area are fully operational or until negative effects from the proposed action are no longer detected. This annual report will summarize the implementation of all of the proposed actions; roost; and tower monitoring results; bat survey results; telemetry study results; salvage, transplant, and restoration results; corrective actions needed or taken (e.g. gating, signing, fencing); any incidental take that occurred; an analysis of the effectiveness of the Conservation BMPs; and work plan for the following year.

- CBP will conduct annual bat surveys at bat roosts within one mile of tower sites for two years from the date towers are fully operational. CBP will compare results with previous years' surveys. If negative effects of the proposed action are documented, CBP will take corrective action (e.g. gating, signing, fencing) and will continue to survey annually until negative effects are no longer detected. Tower TCA-SON-062 is less than a mile from a primary roost (State of Texas Mine) occupied by tens of thousands of bats. The CNM 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. Surveys will be conducted throughout the season by a lesser long-nosed bat expert.
- CBP will monitor roosts within one mile of tower sites for direct or indirect effects of the action for two years from the date towers are fully operational. CBP will install Hobo data loggers in lesser long-nosed bat roosts most prone to human use to detect changes in temperature, humidity, *etc.* CBP will take corrective actions in coordination with USFWS and/or the landowners/land management agencies if such effects are detected. This may include road closures, gating, signing, fencing, *etc.*
- 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. The Patagonia Mountains is covered with hundreds of abandoned mines that may be used by lesser long-nosed bats. Tracking bats telemetered near towers in the Patagonia Mountains will determine where these bats are foraging and roosting. If negative effects are found in

foraging or roosting areas as a result of this proposed action, CBP will take corrective action. This may include road closures, gating, signing, fencing, *etc.*

- 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. If lesser long-nosed bat mortality is documented at tower or wind turbine sites, CBP will: a) immediately notify USFWS in writing. b) work with USFWS to develop site-specific measures to reduce that mortality, and 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 proposed action into an annual report for a minimum of five years.
- Where improved or new roads may increase human use of bat roosts occupied or potentially occupied by lesser long-nosed bats, CBP will prevent access through gating, fencing, other physical barriers, *etc.* This includes the State of Texas mine roost. Patagonia Mountains abandoned mines, and other lesser long-nosed bat roosts. Close coordination with USFWS and landowners and/or land management agencies will be necessary, as the design and season of installation is critical to ensure bat gates benefit lesser long-nosed bats.
- CBP will water transplanted agave and columnar cacti if needed and according to site conditions to ensure survival. CBP will monitor annually for survival for five years and will replace dead or dying plants.
- CBP will replace agaves and columnar cacti removed for construction at a 2:1 ratio. CBP will work with landowners and/or land management agencies 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.

Huachuca Water Umbel - Project Planning/Documentation

- Relocation of individuals of Federally listed plants found in the project area is generally not a suitable activity. Relocation of aquatic species such as the water umbel is not appropriate. For particular actions, the USFWS will determine if relocation of plants will be undertaken.
- Because loss of habitat is a significant risk to the water umbel, CBP will not place roads, fences, structures, or other on-ground facilities within 0.5 mile of occupied or potentially suitable habitat.
- Pre-construction surveys are not required as long as projects are located at least 0.5 mile from occupied habitat areas such that watershed effects will not reach the umbel habitat.

- CBP road construction and maintenance will not improve or create new available access to umbel habitats.

Pima Pineapple Cactus - Project Planning/Documentation

- CBP will conduct surveys according to protocol (Roller 1996) by a qualified Pima pineapple cactus expert along new and improved road segments and tower sites where Harris Environmental did not survey. CBP will avoid impacts to Pima pineapple cactus to the extent practicable.
- Salvage of Pima pineapple cactus has shown very limited success with transplanted individuals experiencing high first-year mortality. CBP will compensate for the loss of habitat through mitigation banking on private land in the Altar Valley.
- CBP road construction and maintenance will not improve or create new available access to cactus habitats.
- CBP will maximize use of existing roads and trails in areas of suitable habitat for the cactus.

Pima Pineapple Cactus - During Construction/Maintenance in Cactus Habitat

- CBP will map and quantify the amount of cactus habitat destroyed or compromised. Removal of topsoil is considered a permanent impact.
- CBP maintenance activities in cactus habitat will not increase the existing disturbed areas.

Pima Pineapple Cactus - Post Construction

- CBP will prepare a Pima pineapple cactus monitoring and mitigation plan for review and approval by landowners and/or land management agencies and USFWS that includes a map of Pima pineapple cactus habitat to be monitored, a map of Pima pineapple cactus habitat destroyed or compromised, number of acres of Pima pineapple cactus habitat destroyed or compromised, pre-construction cactus survey results, method and schedule to monitor the amount of ongoing disturbance from public use and CBP activities, potential corrective actions such as road closures and fencing, amount of habitat to be mitigated, schedule for mitigation banking completion, and content and schedule of annual reports. CBP will complete the plan, in coordination with landowners and/or land management agencies and USFWS, within six months of the date of this project's biological opinion. Implementation of this plan will begin once approved by USFWS and the land management agencies and will be completed within three years from the date all towers within the project area are fully operational. CBP will complete an annual report for a minimum of three years that summarize the implementation of all of the proposed actions, monitoring results, mitigation banking, corrective actions taken, an analysis of the effectiveness of the Conservation BMPs, and work plan for the following year.

- CBP will fund monitoring in suitable cactus habitat within 50 feet of tower sites, repaired roads, and new roads annually for three years. CBP will take corrective action, in coordination with the landowners and/or land management agencies, if Pima pineapple cactus habitat is degraded as a result of the proposed action and increased public use. This includes control of non-native invasive species such as buffelgrass (*Pennisetum ciliare*) and Lehmann lovegrass (*Eragrostis lehmanniana*).
- CBP will compensate for habitat degradation or loss on a 1:1 basis in a conservation bank on private land in Altar Valley within one year of construction of towers.

5.8 CULTURAL RESOURCES

The results of the survey and recommendations are noted in Section 3.10 of this report. A site testing plan for those sites that have unknown eligibility status has been developed through consultation with CBP, the land manager and Arizona State Historical Preservation Officer (SHPO) to ascertain eligibility status for National Register of Historic Places (NRHP). In addition, avoidance assurance measures will be utilized; these have been developed jointly in consultation with CBP, the land manager and Arizona SHPO. Through current design plans and avoidance measures, sites will not be adversely affected by the project. Archaeological monitoring for NRHP-eligible sites adjacent to the access roads and compound areas will be conducted during construction. Archaeologists will delineate all NRHP eligible sites to ensure no adverse effects would occur to those significant resources through the development of an Memorandum of Agreement (MOA) for data recovery, if necessary. Archaeologists will delineate all NRHP-eligible sites to assure no adverse impacts would occur to those significant resources. Archaeologists will also provide in-field awareness training to construction personnel to ensure avoidance. All construction will be restricted to previously surveyed areas. If any cultural material is discovered during construction, Arizona SHPO, and the land manager, as appropriate, will be notified immediately and all activities halted in that area until a qualified archeologist assesses the cultural remains. Additionally, SBI-net will complete the Section 106 process prior to the start of any construction activities.

5.9 WATER RESOURCES

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

A Construction Stormwater General Permit will be obtained prior to construction, and this would 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.

Prior to the start of construction activities, the construction contractor will review the most up-to-date version of the 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.

5.10 AIR QUALITY

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. 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 PM-10 excursions during the construction phase of the proposed project. Additionally, all construction equipment and vehicles will be required to be maintained in good operating condition to minimize exhaust emissions.

5.11 NOISE

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 would 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 would 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.

5.12 UTILITIES

Lighting

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 night-time lighting to migratory bird and nocturnal flying species, and astronomical observatories. Any infrared lighting installed on the proposed towers would be compatible with night vision goggle usage. The tower site lighting proposed for CBP security purposes would: 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.

Currently, it is not anticipated that night-time construction would occur; however if night-time construction becomes necessary its use would be minimized and the lights would be shielded and follow light ordinances.

5.13 HAZARDOUS MATERIALS

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. 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 would 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.

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.

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 on-site receptacles. Solid waste will be collected and disposed of by a local waste disposal contractor.

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.

Where 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.

5.14 POST CONSTRUCTION – GENERAL

For construction and maintenance projects that involve land-disturbing activities (e.g., fences, towers, stations, facilities), CBP will provide a report to the USFWS 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.

During follow-up monitoring, CBP will remove non-native invasive plants found on the site. Removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. All chemical applications on refuges must be in coordination

with refuge manager to ensure accurate reporting. Herbicides can be used according to label directions. The monitoring period will be defined in the site restoration plan. Training to identify non-native invasive plants will be provided for CBP contractor personnel or contractors, as necessary. Lehman lovegrass and buffelgrass are particularly important to control for promoting cactus, including Pima pineapple cactus, and agave re-establishment.

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.

CBP will close roads no longer needed after construction and will restore them to natural surface and topography using appropriate techniques. The GPS coordinates of roads that are thus closed will be recorded and integrated into the USBP GIS database. A record of acreage or miles of roads taken out of use, restored, and revegetated will be maintained and included in Project Reports.

Where improved or new roads may increase use of sensitive areas, CBP will prevent access through gating, physical barriers, *etc.* in coordination with landowners and/or management agencies.

CBP will close and/or restore unauthorized roads at a ratio of 1:1 (one mile of road closed and/or restored for every one mile of road created or repaired) to help offset the anticipated increase in public use of a) repaired or new roads and b) nearby habitat as a result of the proposed action. Roads closures must benefit listed species, be approved by the landowners, be on unauthorized roads receiving use, and be designed properly to prevent access. CBP, USFWS, and the USFS will evaluate the potential increase in public use of repaired and new roads through the USFS's Travel Management program and BANWR management planning within 6 months of the date of this project's BO. Most Forest Service roads to be repaired are classified as Level 2 roads, which are defined as 4WD roads. CBP will quantify a) the post construction

number of miles of new and repaired roads, b) area of new and repaired roads, and c) area of cut and fill. CBP will prepare a road closure/restoration plan in coordination with landowners and/or land management agencies within six months of the date of this project's biological opinion. CBP will assist the USFS in implementing its Travel Management Plan.

- a. For every mile of new or repaired road, CBP will close and/or restore the same length of unauthorized road through gating, physical barriers, discing, revegetating, *etc.* the same length of road.
- b. For every new or improved cut and fill area, CBP will restore the same amount of square footage converted to length of road.

CBP will prepare monitoring and mitigation plans as described in the species-specific conservation BMPs. CBP and USFWS will evaluate effectiveness of monitoring and mitigation methods annually. If monitoring and mitigation methods or implementation are ineffective in reaching desired goals, CBP and USFWS will work together to alter methods or implementation.

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SECTION 6.0
REFERENCES

6.0 REFERENCES

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SECTION 7.0
ACRONYMS AND ABBREVIATIONS

7.0 ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADA	Arizona Department of Agriculture
ADES	Arizona Department of Economic Security
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AEFSO	Arizona Ecological Field Services Office
AGFD	Arizona Game and Fish Department
AMA	active management area
ANSI	American National Standards Institute
AOR	area of responsibility
APS	Arizona Public Service Company
ASLD	Arizona State Land Department
ASTM	American Society for Testing and Materials
AZDC	Arizona Department of Commerce
BANWR	Buenos Aires National Wildlife Refuge
BEA	Bureau of Economic Analysis
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
BP	before present
CAA	Clean Air Act
CBP	U.S. Customs and Border Protection
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CNF	Coronado National Forest
CNM	Coronado National Memorial
CO	carbon monoxide
COP	Common Operating Picture
CPNWR	Cabeza Prieta National Wildlife Refuge
CRT	communications relay tower
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DHS	Department of Homeland Security
DOI	Department of Interior
DPS	distinct population segment

EA	Environmental Assessment
EIS	Environmental Impact Statement
EM	electromagnetic
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1980 and 1995
FR	Federal Register
FSR	forest service road
GHz	giga Hertz
GIS	Geographic Information System
GLO	General Land Office
GSRC	Gulf South Research Corporation
Harris	Harris Environmental Group Incorporated
Hz	hertz
HUD	Department of Housing and Urban Development
I-8	Interstate 8
I-10	Interstate 10
I-17	Interstate 17
I-19	Interstate 19
IDIAT	Identification Interim Assistance Team
IC	illegal crosser
IEEE	Institute of Electrical and Electronics Engineers
INA	Immigration and Naturalization Act
INS	Immigration and Naturalization Service
IPAC	Information, Planning, and Consultation
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act of 1996
JTF-6	Joint Task Force Six
kW	kilowatt
LLNB	lesser long-nosed bat
LMR	land mobile radio
LOS	line-of-sight
LUST	leaking underground storage tank
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPE	Maximum Permissible Exposure
mph	miles per hour
MRI	Midwest Research Institute
MHz	mega hertz
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOA	Notice of Availability

NCRP	National Council of Radiation Protection and Measurements
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NO _x	nitrous oxides
NOI	Notice of Intent
NPL	National Priorities List
NPS	National Park Service
NRHP	National Register of Historic Places
NRCS	Natural Resource Conservation Service
NTIA	National Telecommunications and Information Administration
NWP	Nationwide Permits
O ₃	ozone
OET	Office of Engineering and Technology
OPCNM	Organ Pipe Cactus National Monument
PAC	primary activity center
PCPI	per capita personal income
PDEQ	Pima County Department of Environmental Quality
PEIS	Programmatic Environmental Impact Statement
Pb	lead
PM-10	particulate matter measuring less than 10 microns
PM-2.5	particulate matter measuring less than 2.5 microns
P.L.	Public Law
POE	port of entry
POL	petroleum, oil, and lubricants
ppm	parts per million
RB	Ravens Butte
RF	radio frequency
RDT	rapidly deployed tower
ROI	region of influence
ROW	right-of-way
RRVS	radar and remote video system
SBI	Secure Border Initiative
SHPO	State Historic Preservation Office
SMS	Scenery Management System
SO ₂	sulfur dioxide
SPCCP	Spill Prevention, Control and Countermeasures Plan
SR	State Road or State Highway
STATSGO	State Soil Geographic Database
SST	self standing tower
SSURGO	Soil Survey Geographic Database
SWMP	stormwater management plan
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
TI	tactical infrastructure
TPI	total personal income
UAS	unmanned aircraft systems

UGS	unattended ground sensors
U.S.	United States
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
U.S.C.	U.S. Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
USIBWC	U.S. Section, International Boundary and Water Commission
UST	underground storage tanks
VOC	volatile organic compound
WASSPT	Wide Area Surveillance Sensor Placement Tool
WSC	wildlife of special concern
WUS	Waters of the U.S.

SECTION 8.0
LIST OF PREPARERS



8.0 LIST OF PREPARERS

The following people were primarily responsible for preparing this Environmental Assessment.

NAME	AGENCY/ORGANIZATION	DISCIPLINE/EXPERTISE	EXPERIENCE	ROLE IN PREPARING EA
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