

APPENDIX A
CORRESPONDENCE



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U.S. Customs and
Border Protection

May 23, 2013

Honorable Ned Norris, Jr., Chairman
Tohono O'odham Nation
Main Street
Building #9
Sells, AZ 85634

Dear Chairman Norris:

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) would like to invite the Tohono O'odham Nation to be a cooperating agency for the development of an environmental assessment (EA) for the proposed Integrated Fixed Towers (IFT) within the Chukut Kuk and Gu-Vo Districts of the Tohono O'odham Nation. CBP has also contacted the Bureau of Indian Affairs, Papago Agency to request their participation as a cooperating agency for this undertaking.

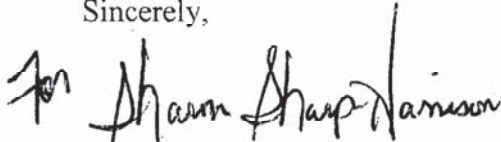
On May 9, 2013, the Tohono O'odham Legislative Council passed Resolution #13-142 *Authorizing the U.S. Customs and Border Protection to Conduct Environmental Assessments, and Conduct Pre-Development Activities for the Proposed Integrated Fixed Tower Program in Accordance with the Laws of the Nation and the United States.*

CBP will prepare the National Environmental Policy Act (NEPA) document to adequately identify resource impacts and any potential mitigation to ensure resource protection where necessary. CBP is ultimately responsible for assuring compliance with the requirements of NEPA, the Endangered Species Act of 1973 as amended, the National Historic Preservation Act of 1966 as amended, and the Archeological and Historical Preservation Act of 1974.

As a cooperating agency, we are requesting the Tohono O'odham Nation cooperate and provide input, review, and comments in the development of the EA to ensure the document meets the needs of the Tohono O'odham Nation. As the lead Federal agency for this undertaking, CBP will solely be responsible for signing and distributing the final EA and Finding of No Significant Impact (FONSI).

Should you have any additional questions or concerns about this project please contact Ms. Sharon Sharp-Harrison at (571) 468-7174 or email at sharon.l.sharp-harrison@cbp.dhs.gov at your earliest convenience. We look forward to working with you on this project.

Sincerely,



Mary D. Hassell, CEP
Environmental and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 S. Bell Street, Suite 700
Alexandria, VA 20598

Cc: Peter Steere, THPO
Karen Howe, Natural Resources
Christopher Brooks, Water Resources
David Jacome, Realty Office
Augustine Toro, Director, Natural Resources
Frances Conde, Chair, Legislative Cultural Preservation Committee
Lorraine Eiler, Chair, Legislative Natural Resources Committee

Enclosure: Figure 1. IFT Proposed Tower Locations

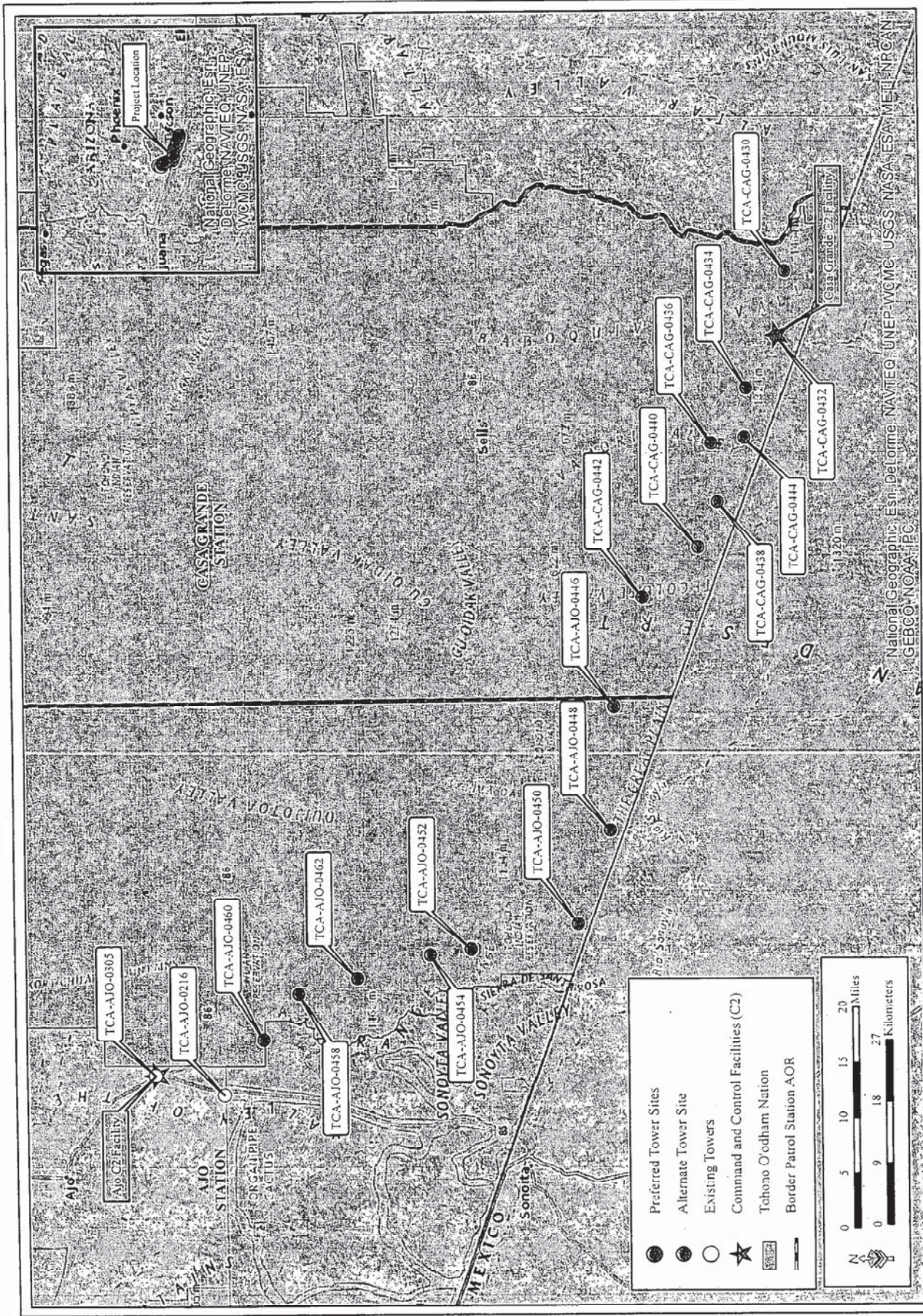


Figure 1. IFT Proposed Tower Locations - Ajo and Casa Grande Stations



U.S. Customs and
Border Protection

May 28, 2013

Ms. Amy Heuslein, Western Region Environmental Protection Officer
Bureau of Indian Affairs
2600 N. Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3050

Dear Ms. Heuslein:

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) would like to invite the Bureau of Indian Affairs (BIA) to be a cooperating agency for the development of an environmental assessment (EA) for the proposed Integrated Fixed Towers (IFT) within the Chukut Kuk and Gu-Vo Districts of the Tohono O'odham Nation. CBP has also contacted the Tohono O'odham Nation and the BIA Papago Agency to request their participation as cooperating agencies for this undertaking.

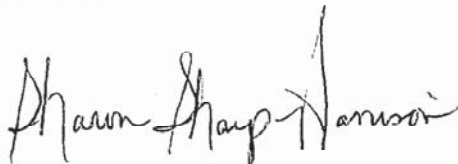
On May 9, 2013 the Tohono O'odham Legislative Council passed Resolution #13-142, *Authorizing the U.S. Customs and Border Protection to Conduct Environmental Assessments, and Conduct Pre-Development Activities for the Proposed Integrated Fixed Tower Program in Accordance with the Laws of the Nation and the United States.*

CBP will prepare a National Environmental Policy Act (NEPA) document to adequately identify resource impacts and any potential mitigation to ensure resource protection where necessary. CBP is ultimately responsible for assuring compliance with the requirements of NEPA, the Endangered Species Acts of 1973 as amended, the National Historic Preservation Act of 1966 as amended, and the Archeological and Historical Preservation Act of 1974.

As a cooperating agency, we are requesting the BIA cooperate and provide input, review, and comments in the development of the Environmental Assessment (EA) to ensure the document meets the needs of the BIA. As the lead Federal agency for this undertaking, CBP will solely be responsible for signing and distributing the final EA and Finding of No Significant Impact (FONSI).

Should you have any additional questions or concerns about this project please contact Ms. Sharon Sharp-Harrison at (571) 468-7174 or email at sharon.l.sharp-harrison@cbp.dhs.gov at your earliest convenience. We look forward to working with you on this project.

Sincerely,

for 

Mary D. Hassell, CEP
Environment and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 S. Bell Street, Suite 700
Alexandria, VA 20598

Enclosure: Figure 1. Proposed IFT Tower Locations

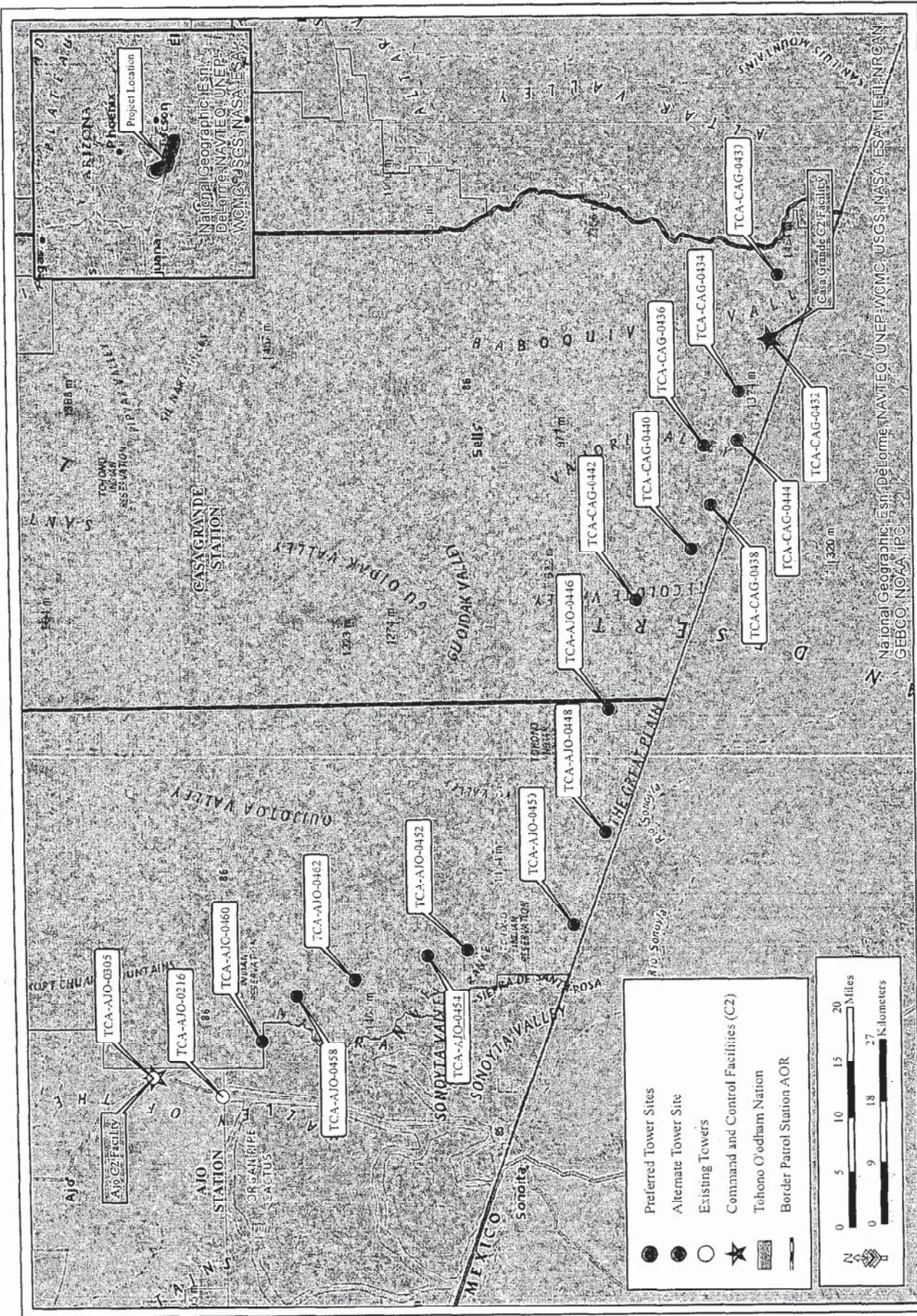


Figure 1. IFT Proposed Tower Locations - Ajo and Casa Grande Stations



**U.S. Customs and
Border Protection**

May 28, 2013

Ms. Nina Siquieros, Superintendent
Papago Agency, Bureau of Indian Affairs
P.O. Box 490
Sells, AZ 85634

Dear Ms. Siquieros:

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) would like to invite the Bureau of Indian Affairs (BIA), Papago Agency to be a cooperating agency for the development of an environmental assessment (EA) for the proposed Integrated Fixed Towers (IFT) within the Chukut Kuk and Gu-Vo District of the Tohono O'odham Nation. CBP has also contacted the Tohono O'odham Nation and the BIA Western Regional Office to request their participation as cooperating agencies for this undertaking.

On May 9, 2013 the Tohono O'odham Legislative Council passed Resolution #13-142, *Authorizing the U.S. Customs and Border Protection to Conduct Environmental Assessments, and Conduct Pre-Development Activities for the Proposed Integrated Fixed Tower Program in Accordance with the Laws of the Nation and the United States.*

CBP will prepare a National Environmental Policy Act (NEPA) document to adequately identify resource impacts and any potential mitigation to ensure resource protection where necessary. CBP is ultimately responsible for assuring compliance with the requirements of NEPA, the Endangered Species Acts of 1973 as amended, the National Historic Preservation Act of 1966 as amended, and the Archeological and Historical Preservation Act of 1974.

As a cooperating agency, we are requesting the Papago Agency cooperate and provide input, review, and comments in the development of the Environmental Assessment (EA) to ensure the document meets the needs of the Papago Agency and the BIA. As the lead Federal agency for this undertaking, CBP will solely be responsible for signing and distributing the final EA and Finding of No Significant Impact (FONSI).

Should you have any additional questions or concerns about this project please contact Ms. Sharon Sharp-Harrison at (571) 468-7174 or email at sharon.l.sharp-harrison@cbp.dhs.gov at your earliest convenience. We look forward to working with you on this project.

Sincerely,

for Sharon Sharp-Harrison

Mary D. Hassell, CEP
Environment and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 S. Bell Street, Suite 700
Alexandria, VA 20598

Enclosure: Figure 1. Proposed IFT Tower Locations

TON IFT EA Agency Coordination Letters

1. Bureau of Indian Affairs
Ms. Amy Heuslein, Western Region Environmental Protection Officer
2600 N. Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3050

2. Bureau of Indian Affairs
Ms. Nina Siqueiros, Superintendent
Papago Agency
P.O. Box 490
Sells, AZ 85634
(520) 383-3286

3. Tohono O'odham Nation
Honorable Ned Norris
Main Street
Building #49
Sells, AZ 85634

- Cc: Peter Steere, THPO
Karen Howe, Natural Resources
Christopher Brooks, Water Resources
Gerald Fayuant, Director, Realty Office
Augustine Toro, Director, Natural Resources
Frances Conde, Chair, Legislative Cultural Preservation Committee
Lorraine Eiler, Chair, Legislative Natural Resources Committee
Ethel Garcia, Chair, Domestic Affairs Committee
Timothy Joaquin, Chairman, Tohono O'odham Legislative Council
Lorinda Sam, Director, Tohono O'odham Nation Environmental Protection Office

4. Mr. James Garrison, State Historic Preservation Officer
Arizona State Parks
Attn: Dr. James Cogswell, Ph.D., Compliance Specialist/Archaeologist
State Historic Preservation Office
1300 West Washington Street
Phoenix, Arizona 85007

5. Arizona Department of Environmental Quality
ATTN: Mr. Henry Darwin, Director
1110 West Washington Street
Phoenix, AZ 85007

6. Arizona Department of Environmental Quality
Southern Regional Office
Office of Border Environmental Protection
ATTN: Ms. Edna Mendoza, Director
400 West Congress, Suite 433
Tucson, AZ 85701
7. Arizona Game and Fish Department
Ms. Laura Canaca, Project Evaluation Program Supervisor
Habitat Branch- Project Evaluation Program
5000 W. Carefree Highway
Phoenix, AZ 85086-5000
8. Arizona Game and Fish Department
Mr. John Windes, Habitat Program Manager, Region V
555 N. Greasewood Road
Tucson, AZ 85023
9. Mr. Nova Blazej, Manager Environmental Review Office Coordinator
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, CA 94105
10. Ms. Lisa Hanf, Office of Federal Activities
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105
11. U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
ATTN: Mr. Steve Spangle, Field Supervisor
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915
12. Department of the Interior
ATTN: Mr. Jon Andrew
1849 C Street, NW
MS 3428
Washington, DC 20240
13. U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
ATTN: Ms. Jean A. Calhoun, Assistant Field Supervisor
201 N. Bonita Avenue, Suite 141
Tucson, AZ 85745

14. U.S. Army Corps of Engineers
Ms. Marjorie Blaine, Senior Project Manager
5205 East Comanche Street
Tucson, AZ 85707

15. U.S. Army Corps of Engineers
Colonel Thomas H. Magness, District Commander
915 Wilshire Boulevard
Suite 980
Los Angeles, California 90017

16. Mr. Edward Drusina, Commissioner
International Boundary and Water Commission
4171 North Mesa
Building C, Suite C-100
El Paso, TX 79902-1441

17. Mr. Bernie Kruse, Supervisory General Engineer
International Boundary and Water Commission
4171 North Mesa
Building C, Suite 310
El Paso, Texas 79902

18. Ms. Sharon Bronson, Supervisor, District 3
Pima County Board of Supervisors
130 West Congress St., 11th floor
Tucson, AZ 85701

19. Mr. Chuck Huckelberry, County Administrator
Pima County
130 West Congress St., 10th Floor
Tucson, AZ 85701



U.S. Customs and
Border Protection

May 28, 2013

Colonel Thomas H. Magness, District Commander
U.S. Army Corps of Engineers
915 Wilshire Boulevard
Suite 980
Los Angeles, CA 90017

SUBJECT: Environmental Assessment for the Proposed Construction, Operation and Maintenance of Integrated Fixed Towers on the Tohono O'odham Nation, Office of Technology Innovation and Acquisition, U.S. Border Patrol, Tucson Sector, Arizona

Dear Colonel Magness:

On behalf of the Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), the U.S. Army Corps of Engineers (USACE), Fort Worth District, is preparing an Environmental Assessment (EA) for the Office of Technology Innovation and Acquisition's (OTIA) construction, maintenance and operation of Integrated Fixed Towers (IFT) for the U.S. Border Patrol (USBP) in the Ajo and Casa Grande Stations' Areas of Responsibility within the Border Patrol's Tucson Sector. The proposed action is located on the Tohono O'odham Nation within Pima County, Arizona. This proposed system of towers and access/approach roads would create a communications network in support of overall law enforcement situational awareness in the project area.

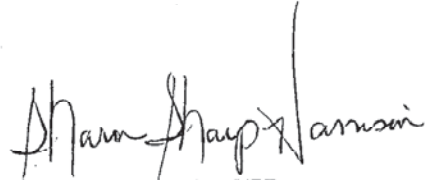
The EA will analyze the potential for significant adverse impacts and beneficial effects on the environment from the proposed action and two alternatives (alternative 1 and the no action alternative). The proposed action includes the construction of up to 15 new sensor and communication towers, including tower access/approach road construction, improvements, repairs, and maintenance. Additionally, proposed tower construction at one other site will be analyzed as alternative 1. The no action alternative reflects conditions within the project area should the proposed action not be implemented. Enclosed is a map showing the 15 new tower sites and one alternative proposed as part of OTIA's Tohono O'odham Nation IFT Project (Figure 1).

CBP is gathering data and input from federal, state, tribal, and local governmental agencies, departments, and bureaus that may be affected by or otherwise have an interest in, this proposed action. Since your agency or organization may have particular knowledge and expertise regarding potential environmental impacts from CBP's proposed action, your input is sought regarding the likely or anticipated environmental effects of this proposed action. Your response should include any restrictions, permitting or other requirements with which CBP would have to comply during project siting, construction, and operation.

Per DHS Directive 023-1, Environmental Planning Program, we will provide your agency with a copy of the official Draft EA of OTIA's IFT proposed project for your review and comment. Please let us know if additional copies are needed.

Should you have any additional questions or concerns about this project please contact Ms. Sharon Sharp-Harrison at (571) 468-7174 or email at sharon.l.sharp-harrison@cbp.dhs.gov at your earliest convenience. We look forward to working with you on this project.

Sincerely,

for 

Mary D. Hassell, CEP
Environment and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 S. Bell Street, Suite 700
Alexandria, VA 20598

Enclosure: Figure 1. IFT Proposed Tower Locations

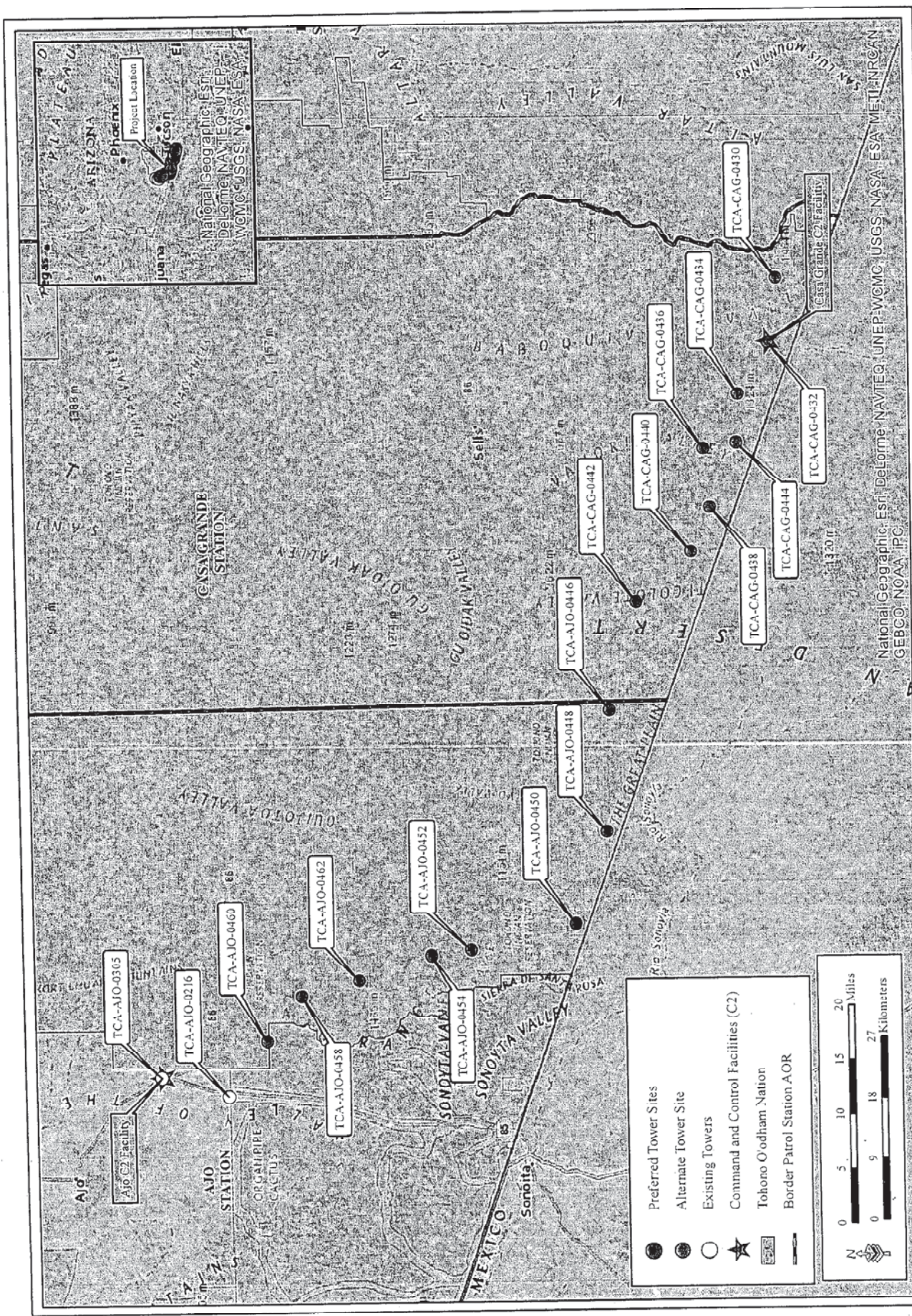


Figure 1. IFT Proposed Tower Locations - Ajo and Casa Grande Stations

Rec'd OTIA ENV
06/17/2013



INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

June 7, 2013

Mary D. Hassell, CEP
Environment and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 S. Bell Street, Suite 700
Alexandria, VA 20598

Subject: Environmental Assessment for the Proposed Construction, Operation and Maintenance of Integrated Fixed Towers on the Tohono O'odham Nation, Office of Technology Innovation and Acquisition, U.S. Border Patrol, Tucson Section, Arizona

Dear Ms. Hassell:

Thank you for the opportunity to provide scoping comments for the Environmental Assessment (EA) being prepared by the U.S. Army Corps of Engineers on behalf of U.S. Customs and Border Patrol (CBP). The EA will analyze impacts from the proposed construction, maintenance and operation of Integrated Fixed Towers (IFT) for the U.S. Border Patrol (USBP) in the Ajo and Casa Grande Stations Area of Responsibility within the USBP's Tucson sector. The IFTs will provide a communications network and will be constructed on the Tohono O'odham Nation within Pima County, Arizona.

From the map provided, many of the proposed tower locations appear to be near the international boundary (2 of the proposed 16 tower locations within 1 mile of the boundary, 11 within 5 miles, and 3 additional towers within 20 miles). The United States Section of the International Boundary and Water Commission (USIBWC) would like to offer the following comments for your consideration. The USIBWC has no jurisdiction within the Native American reservations in Arizona, and in this case, the Tohono O'odham Nation. However, if the proposed towers will be constructed along the international boundary, the following comments shall apply.

The USIBWC requests that proposed construction activities be accomplished in a manner that does not change historic surface runoff characteristics at the international border. The USIBWC will not approve any construction near the international boundary in the United States that increases, concentrates, or relocates overland drainage flows into either country. This requirement is intended to ensure that developments in one country will not cause damage to lands or resources in the other country. The USIBWC requests copies of any hydrological or hydraulic studies and site specific drawings for work proposed in the vicinity of the international boundary, particularly if culverts or other structures are proposed to be constructed in any drainage courses that cross the boundary. We also request that you assure that structures constructed along the U.S./Mexico border are maintained in an adequate manner and that liability issues created by these structures are addressed.

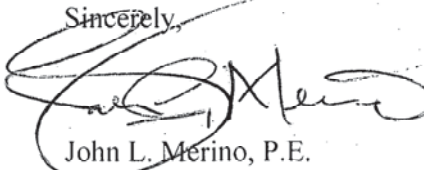
The USIBWC has a duty to access, maintain, and utilize the international boundary monuments along the United States/Mexico international land boundary. The USIBWC is charged with these duties through treaties and international agreements between the United States and Mexico. We require that the proposed works, and related facilities not affect the permanence (disturb the foundations) of existing

boundary monuments nor impede access for their maintenance. In addition, any proposed construction must allow for line-of-sight visibility between each of the boundary monuments.

For your information, on June 25, 1897 a Presidential Proclamation was signed by President William McKinley to keep lands free from obstruction as protection against smuggling of goods between the United States and Mexico. The proclamation reserved a strip of land 60 feet wide, parallel with and adjacent to the international boundary, extending one mile east and one mile west of Monument No. 122 within the City of Nogales, Arizona. Following a recommendation that additional lands be reserved along the boundary, President Theodore Roosevelt signed a Presidential Proclamation on May 27, 1907 reserving a 60-foot wide strip of land parallel with and adjacent to the international boundary on all lands which were not already patented (i.e. Indian Reservations, National Parks and Monuments, private property etc.) to the boundary line through New Mexico, Arizona, and California. It is the responsibility of the United States (federal agencies) to ensure the integrity of the 60-foot strip of reserved land. Similar lands are also designated by Mexico along its side of the land boundary. The provisions of the 1907 Presidential declaration for the 60-foot wide strip adjacent to the international boundary would not apply in the Tohono O'odham Nation.

Thank you for the opportunity to provide comments on projects potentially impacting the international boundary with Mexico. If you have any questions regarding these comments, please call me at (915) 832-4749.

Sincerely,



John L. Merino, P.E.
Principal Engineer

Rec'd OTIA ENV
Aug. 8, 2013



United States Department of the Interior



Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

AESO/SE
02EAAZ00-2013-TA-0256

July 19, 2013

Ms. Mary D. Hassell
Environment and Real Estate
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
1901 South Bell Street, Suite 700
Alexandria, Virginia 20598

Dear Ms. Hassell:

Thank you for your correspondence of May 28, 2013, received in our office on June 6, 2013. This letter replies to your request for data and input related to the U.S. Customs and Border Protection (CBP) Office of Technology, Innovation, and Acquisition's proposal to construct, operate, and maintain a series of Integrated Fixed Towers (IFT) for the U.S. Border Patrol within the U.S. Border Patrol's Tucson Sector, Ajo and Casa Grande Stations, Pima County, Arizona. The project will occur entirely upon Tohono O'odham Nation (TON) lands.

The project area supports habitat for three species listed under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) (Act). The jaguar (*Panthera onca*), the Sonoran pronghorn (*Antilocapra americana sonoriensis*), and the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) are all listed as endangered under the Act. In addition, critical habitat has been proposed for the jaguar and includes some area within the TON. An additional species, the Sonoran desert tortoise (*Gopherus morafkai*), is a candidate species under the Act and has a potential listing action scheduled within the next two years in response to a nationwide legal settlement.

The project also includes habitat for the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*; pygmy-owl), a species formerly listed as endangered under the Act. A final rule to

remove the pygmy-owl from the Endangered Species list was published April 14, 2006. Therefore, the protective regulations of the Act no longer apply to the pygmy-owl. However, upon request, we continue to provide technical assistance related to the conservation of the pygmy-owl. The pygmy-owl is also a species of cultural and religious concern to the Tohono O'odham people.

Because impacts to these species or their habitats may occur as a result of the proposed project, we urge you to consider the following information and recommendations.

Jaguar

In 1972, the jaguar (*Panthera onca*) was listed as endangered (37 FR 6476; March 30, 1972) in accordance with the Endangered Species Conservation Act of 1969 (ESCA), a precursor to the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*). On July 22, 1997, the Service published a final rule clarifying that endangered status for the jaguar extended into the United States (62 FR 39147).

Jaguars are known from a variety of vegetation communities (Seymour 1989), including those found in the arid Southwest (Nowak 1994). In arid areas, these vegetation communities include thornscrub, desertscrub, lowland desert, mesquite grassland, Madrean oak woodland, and pine-oak woodland communities of northwestern Mexico and southwestern U.S. (Boydston and López González 2005, McCain and Childs 2008, López González and Brown 2002). Recently, several studies have helped refine general understanding of habitats that have been or might be used by jaguars in Arizona and New Mexico, including studies by the Sierra Institute Field Studies Program (2000), Hatten *et al.* (2002 and 2005), Menke and Hayes (2003), Boydston and López González (2005), Robinson *et al.* (2006), McCain and Childs (2008), and Sanderson and Fisher (2011 and 2013).

Like most large carnivores, jaguars have relatively large home ranges. According to Brown and López-González (2001), their home ranges are highly variable and depend on sex, topography, available prey, and population dynamics. However, little information is available on this subject outside tropical America, where several studies of jaguar ecology have been conducted. Several studies have shown that jaguars selectively use large areas of relatively intact habitat away from certain forms of human influence. In the state of Mexico, Monroy-Vichis *et al.* (2007) report that jaguars occur with greater frequency in areas relatively distant from roads and human populations. Zarza *et al.* (2007) report that towns and roads had an impact on the spatial distribution of jaguars (jaguars used more frequently than expected by chance areas located more than 6.5 km from human settlements and 4.5 km from roads) in the Yucatan peninsula.

Information related to current patterns of occupancy for jaguars in the border region are limited. Recently (1996 through 2013), five individual male jaguars have been documented in the U.S. From 2001 to 2007, three jaguars were photographed (two repeatedly) using infra-red camera traps in south-central Arizona, near the Mexico border. Specifically, these three jaguars were documented in four different mountain range complexes over an area extending from the

U.S./Mexico international border north 47 mi and 39 mi east to west (McCain and Childs 2008). The most recent sightings of the fifth jaguar have been from the Whetstone and Santa Rita mountains. This recent documentation is a result of an ongoing camera-trap study by the University of Arizona. Jaguars have been found using areas from rugged mountains at 1,577 m (5,174 ft) to flat lowland desert floor at 877 m (2,877 ft.) (McCain and Childs 2008). Most jaguar detections have occurred in Madrean oak woodland communities; however, jaguars have also been documented in open mesquite grasslands and desert scrub/grasslands on the desert valley floor. McCain and Childs (2008), in the earlier study, were not able to use camera trapping techniques in open valley bottoms due the open expanses and lack of landscape features to direct or funnel wildlife movements and consequently could not determine the extent open areas are used by jaguars in Arizona. They report, however, the jaguars must at least cross the open valleys between mountain ranges, approximately 37 mi apart. Although more information on movement and distribution patterns needs to be gathered on jaguars in the borderlands region of Arizona, New Mexico, Sonora, and Chihuahua, it is believed that the males recently documented in Arizona and New Mexico likely interact with or are part of a jaguar population in northwestern Mexico. Maintaining habitat linkages to facilitate movement within this population is important.

The TON has recently received a contract to expand the ongoing camera-trap study currently being conducted by the University of Arizona to the western slopes of the Baboquivari Mountains within the TON. This study will provide additional information over the next two years regarding the occurrence of jaguars within the TON.

We believe that the proposed action may result in degradation of jaguar habitat and disturbance to jaguars. Construction and maintenance of the tower sites, staging areas, and roads, as well as patrol and apprehension activities associated with the operation of the proposed towers, will result in removal, destruction, and degradation of vegetation that may provide cover to jaguars and their prey, and may disturb jaguars, causing changes in their habitat use and movement patterns. Construction of the proposed towers and associated roads and staging areas will impact (cause the loss and degradation) jaguar habitat through resulting ground disturbance, vegetation removal, soil compaction, erosion, and possible alteration of hydrological processes. These impacts will decrease the amount of cover available to jaguars and their prey. Further, disturbed ground will be susceptible to colonization by invasive non-native plants such as buffelgrass (*Pennisetum ciliare*). Non-native species may out-compete native species and may also carry fire better or burn hotter than native plants, which could also degrade jaguar habitat.

Construction, operations, and maintenance activities (including use of access roads) associated with the proposed action may result in increased disturbance to jaguars. Human activity, elevated noise levels (from vehicles, generators, etc.), and lights associated with construction and operations could possibly deter jaguar use of or movement through the area. Studies have shown that jaguars selectively use areas away from human influence (Monroy-Vichis *et al.* 2007, Zarza *et al.* 2007). Access-road construction and improvement and/or maintenance may lead to better public access and increased use, which could result in degradation of jaguar habitat and disturbance to jaguars. Also, an increase in public use will likely result in greater frequency of

human-caused fires, as well as increased hunting and illegal off-highway vehicle use. Vehicle and foot traffic can lead to the destruction of vegetation, increased erosion, and degradation of riparian and other sensitive habitats.

Given that the proposed system of towers is located on the border, increased disturbance to jaguars associated with the construction and operation of the proposed towers could possibly hinder jaguar movement into the U.S. from Mexico and within the project area. Maintaining connectivity between Arizona and Sonora is critical to the continued presence of jaguars in Arizona.

We recommend that the following measures be considered for inclusion as part of the proposed action related to the construction and operation of these towers in order to reduce the potential impacts to jaguars: 1) minimize impacts to vegetation, especially in likely jaguar travel corridors (rugged mountainous areas and drainages); 2) minimize the extent and width of roads associated with the proposed construction and operation of the towers; 3) work with the TON to control access to roads associated with the proposed towers; 4) locate staging areas at sites where vegetation disturbance will be minimized and outside of likely jaguar travel corridors; and 5) eliminate or limit the use of nighttime lighting associated with the construction and operation of the proposed towers in areas of likely jaguar movements. In particular, the area in the vicinity of the proposed TCA-CAG-0430 tower is within an area designated as a jaguar movement corridor during development of the Sasabe pedestrian fence. This area is also adjacent to proposed jaguar critical habitat. We recommend that the need for a tower in this area be reevaluated.

Proposed Jaguar Critical Habitat

On August 20, 2012, we proposed critical habitat for the jaguar in response to a court order (77 FR 50214). Subsequently, we reopened the public comment period on proposed jaguar critical habitat on July 1, 2013 (78 FR 39237) to allow public comment on the economic analysis of proposed jaguar critical habitat, as well as slight modifications to the proposed boundaries. Based on the map enclosed with your May 28, 2013 correspondence, it appears that one of the proposed towers, TCA-CAG-0430, is just outside of the proposed critical habitat for the jaguar. Six units are proposed for designation as critical habitat (in the U.S. only); these are considered occupied at the time listing and contain the components of the primary constituent elements in the appropriate quantity and spatial arrangement sufficient to support the life-history needs of the species. Two of these units also contain subunits considered unoccupied at the time of listing, but which we deemed were essential to the survival and recovery of the jaguar. The six units proposed as critical habitat are: (1) Baboquivari Unit divided into subunits (1a) Baboquivari-Coyote Subunit, including the Northern Baboquivari, Saucito, Quinlan, and Coyote Mountains, and (1b) the Southern Baboquivari Subunit; (2) Atascosa Unit, including the Pajarito, Atascosa, and Tumacacori Mountains; (3) Patagonia Unit, including the Patagonia, Santa Rita, and Huachuca Mountains and the Canelo Hills; (4) Whetstone Unit, divided into subunits (4a) Whetstone Subunit, (4b) Whetstone-Santa Rita Subunit, and (4c) Whetstone-Huachuca Subunit; (5) Peloncillo Unit, including the Peloncillo Mountains both in Arizona and New Mexico; and

(6) San Luis Unit, including the northern extent of the San Luis Mountains at the New Mexico-Mexico border.

With regard to the proposed IFT project, the following subunits of Unit 1 may be affected by the proposed action:

Subunit 1a: Baboquivari-Coyote Subunit

Subunit 1a consists of 35,882 ha (88,667 ac) in the northern Baboquivari, Saucito, Quinlan, and Coyote Mountains in Pima County, Arizona. This subunit is generally bounded by the Baboquivari Valley to the west, State Highway 86 to the north, the Altar Valley to the east, and Three Peaks to the south. Land ownership within the unit includes approximately 4,360 ha (10,775 ac) of Federal lands; 20,036 ha (49,511 ac) of Tohono O'odham Nation lands; 8,483 ha (20,962 ac) of Arizona State lands; and 3,003 ha (7,420 ac) of private lands. The Federal land is administered by the Service and Bureau of Land Management. We consider the Baboquivari-Coyote Subunit occupied at the time of listing (37 FR 6476; March 30, 1972) based on one photo of a jaguar in 1996, and multiple photos of this same jaguar from 2001–2009, and it may be currently occupied. It contains all elements of the physical or biological feature essential to the conservation of the jaguar, except for connectivity to Mexico.

The primary land uses within Subunit 1a include ranching, grazing, border-related activities, Federal land management activities, and recreational activities throughout the year, including, but not limited to, hiking, birding, horseback riding, and hunting. Special management considerations or protections needed within the unit would need to address increased human disturbances in remote locations through construction of impermeable fences and widening or construction of roadways, power lines, or pipelines to ensure all PCEs remain intact.

Subunit 1b: Southern Baboquivari Subunit

Subunit 1b consists of 20,359 ha (50,308 ac) in the southern Baboquivari Mountains in Pima County, Arizona. This subunit is generally bounded by the Baboquivari Valley to the west, Three Peaks to the north, the Altar Valley to the east, and the U.S.-Mexico border to the south. Land ownership within the unit includes approximately 644 ha (1,591 ac) of Federal lands; 10,853 ha (26,818 ac) of Tohono O'odham Nation lands; 7,005 ha (17,310 ac) of Arizona State lands; and 1,857 ha (4,589 ac) of private lands. The Federal land is administered by the Service and Bureau of Land Management. The Southern Baboquivari Subunit provides connectivity to Mexico and was not considered occupied at the time of listing. It is essential to the conservation of the jaguar because it contributes to the species' persistence by providing connectivity to occupied areas that support individuals during dispersal movements during cyclical expansion and contraction of the nearest core area and breeding population in the Northwestern Recovery Unit.

The primary land uses within Subunit 1b include ranching, grazing, border-related activities, Federal land management activities, and recreational activities throughout the year, including, but not limited to, hiking, birding, horseback riding, and hunting. The proposed tower TCA-CAG-0430 would be located just outside of this unit of proposed jaguar critical habitat.

Primary Constituent Elements for Jaguar Critical Habitat

The physical or biological feature identified for proposed critical habitat for the jaguar is expansive open spaces in the southwestern United States with adequate connectivity to Mexico that contain a sufficient native prey base and available surface water, have suitable vegetative cover and rugged topography to provide sites for resting, and have minimal human impact (77 FR 50214). Because habitat in the United States is at the edge of the species' northern range, and is marginal compared to known habitat throughout the range, we have determined that all of the primary constituent elements discussed, below, must be present in each specific area to constitute high-quality jaguar habitat in the United States, including connectivity to Mexico (but that connectivity may be provided either through a direct connection to the border in that unit or by other adjacent areas that provide the connectivity essential for the conservation of the species). Based on our current knowledge of the physical or biological feature and habitat characteristics required to sustain the jaguar's vital life-history functions in the United States, the FWS determined that the primary constituent elements specific to jaguars are: Expansive open spaces in the southwestern United States of at least 84 to 100 square km (32 to 37 square mi) in size which:

- (1) Provide connectivity to Mexico;
- (2) Contain adequate levels of native prey species, including deer and javelina, as well as medium-sized prey such as coatis, skunks, raccoons, or jackrabbits;
- (3) Include surface water sources available within 20 km (12.4 mi) of each other;
- (4) Contain 1 to 50 percent canopy cover within Madrean evergreen woodland, generally recognized by a mixture of oak, juniper, and pine trees on the landscape, or semidesert grassland vegetation communities, usually characterized by *Pleuraphis mutica* (tobosagrass) or *Bouteloua eriopoda* (black grama) along with other grasses;
- (5) Are characterized by intermediately, moderately, or highly rugged terrain;
- (6) Are characterized by minimal to no human population density, no major roads, or no stable nighttime lighting over any 1-square-km (0.4-square-mi) area.
- (7) Are below 2,000 m (6,562 feet) in elevation.

While the proposed IFT project will directly impact some jaguar habitat elements (loss of vegetation cover due to construction of the IFTs and access roads), the primary effect to the PCEs of proposed jaguar critical habitat are related to the increase in human disturbance and presence during the construction, operation, and maintenance of the project. This directly affects PCE #6 and indirectly affects all of the remaining PCEs by potentially reducing the opportunity for jaguars to utilize habitat elements due to ongoing human presence and disturbance. In

particular, the area in the vicinity of the proposed TCA-CAG-0430 tower has been identified as within an area designated as a jaguar movement corridor during development of the Sasabe pedestrian fence. The proposed action would affect the ability of jaguars to move across the border to and from Mexico, which is crucial to the ongoing conservation of jaguars in the U.S.

We suggest that the recommendations discussed above related to effects to jaguars also be considered by CBP as recommendations related to reducing modifications to proposed jaguar critical habitat. Additionally, we recommend that CBP consider relocating tower TCA-CAG-0430 to a location well away from proposed critical habitat and the jaguar movement corridor as discussed above. This will reduce the amount of human activity and disturbance in an important area of jaguar habitat and a recognized movement corridor. We also recommend that site selection for all of the proposed towers and access roads address the need to maintain the availability of jaguar habitat elements such as water, prey, rugged terrain, appropriate vegetation cover, and low human presence.

Lesser Long-Nosed Bat

The lesser long-nosed bat is migratory and found throughout its historical range from southern Arizona and extreme southwestern New Mexico through western Mexico and south to El Salvador. It is found in southern Arizona from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County) and southeast to the Chiricahua Mountains (Cochise County), and south to the U.S./Mexico international border. Individuals have also been observed near the Pinaleno Mountains (Graham County) and as far north as Phoenix and Glendale (Maricopa County) (AGFD Heritage Data Management System [HDMS]). Within the U.S., vegetation communities used by the lesser long-nosed bat include Sonoran Desert scrub, semidesert and plains grasslands, and oak and pine-oak woodlands.

Two sets of resources, suitable day roosts, including maternity roosts, and suitable concentrations of food plants, are critical for the lesser long-nosed bat. Caves and mines are used as day roosts, with documentation showing that the species will fly long distances from roost sites to forage (Dalton *et al.* 1994, U.S. Fish and Wildlife Service 1997). Factors that identify potential roost sites as being "suitable" have not yet been identified, but maternity roosts tend to be very warm and poorly ventilated (U.S. Fish and Wildlife Service 1997). Such roosts reduce the energetic requirements of adult females while they are raising their young (Arends *et al.* 1995). Roosts in Arizona are occupied from April to as late as early November (Cockrum and Petryszyn 1991; Slauson 1999, 2000); although the species has been recorded in winter at hummingbird feeders in Tucson (Sidner and Houser 1990). In spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in southwestern Arizona. These roosts are typically at low elevations in Sonoran Desert scrub near concentrations of flowering columnar cacti. After the young are weaned, maternity colonies typically disband in July and August; some females and young move to higher elevations, ranging up to more than 6,000 ft, primarily in southeastern Arizona near concentrations of blooming paniculate agaves. Dates of these seasonal movements by lesser long-nosed bats are rather variable from one year to the next (Cockrum and Petryszyn 1991, Fleming *et al.* 1993).

Food requirements of the lesser long-nosed bat are very specific. The lesser long-nosed bat is a nectar-, pollen-, and fruit-eating bat. In Arizona, they primarily feed upon Palmer's agave (*Agave palmeri*), Parry's agave (*A. parryi*), desert agave (*A. deserti*), and possibly amole (*A. schottii*). Cacti fed upon include saguaro (*Carnegiea giganteus*) and organ pipe cactus (*Stenocereus thurberi*). Because of its very specific food requirements, the lesser long-nosed bat is considered a major pollinator and seed disperser of columnar cacti (e.g., saguaros) and paniculate agave. Adequate numbers of flowers and/or fruits are required within foraging range of day roosts and along migration routes to support large numbers of this bat. Location of good feeding sites therefore plays an important role in determining availability of potential roosting sites, and roost/food requirements must be considered jointly when discussing the habitat requirements of this bat. A suitable day roost is probably the most important habitat requirement, but potentially suitable roosts must be within reasonable foraging distances of sufficient amounts of required foods before they will be used by this bat.

Night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 24 km (15 mi), and in Mexico at 40 km (25 mi) and 61 km (38 mi) (one way) (Dalton *et al.* 1994; V. Dalton, Tucson, pers. comm., 1997; Y. Petryszyn, University of Arizona, pers. comm., 1997). A substantial portion of the lesser long-nosed bats at the Pinacate Cave in northwestern Sonora (a maternity colony) fly 40 to 50 km (25-31 mi) each night to foraging areas in Organ Pipe Cactus National Monument (U.S. Fish and Wildlife Service 1997). Horner *et al.* (1990) found that lesser long-nosed bats commuted 48 to 58 km (30-36 mi) round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 75 km (47 mi) each night. Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest potential roost site (Petryszyn, pers. comm., 1997).

Considerable evidence exists suggesting a dependence of *Leptonycteris* on certain agaves and cacti. Activities that adversely affect the density and productivity of columnar cacti and paniculate agaves may adversely affect populations of lesser long-nosed bats (Abouhalder 1992, U.S. Fish and Wildlife Service 1997). Excess harvest of agaves in Mexico, collection of cacti in the U.S., and conversion of habitat due to urban expansion, agricultural uses, livestock grazing, and other development may contribute to the decline of long-nosed bat populations (U.S. Fish and Wildlife Service 1988). Activities that directly or indirectly promote invasions or increased density of non-native grasses, particularly buffelgrass, Lehmann lovegrass (*Eragrostis lehmanniana*), species of *Bromus*, and Mediterranean grass (*Schismus barbatus*), may result in increased fire frequency and intensity (Minnich 1994). Sonoran Desert scrub is not adapted to fire. The lesser long-nosed bat forages over wide areas, and roosts require extensive stands of cacti or agaves for food. Therefore, destruction of food plants many miles from a roost could have a negative impact on this bat (U.S. Fish and Wildlife Service 1997).

Impacts also result from law enforcement and apprehension of illegal immigrants and smugglers. Of particular concern is the creation of new roads for surveillance and other tactical infrastructure used for border enforcement. Use of helicopters, off-road vehicles, lights, sensors

and other enforcement equipment also have the potential to affect the lesser long-nosed bat and its habitat (U.S. Fish and Wildlife Service 2007). Loss of foraging habitat is also an important threat to lesser long-nosed bats. Causes of loss of foraging habitat in the action area include fire, livestock grazing, non-native invasive plants, and development (including the building of infrastructure on the border in the U.S.). Lesser long-nosed bats are directly affected by development, which removes forage habitat, but also indirectly as growing numbers of people increase the potential for roost disturbance. The impacts to lesser long-nosed bat habitat are of greatest concern because they tend to be permanent, long-term disturbances, as opposed to the often temporary, shorter-term impacts from fire, grazing, and agave harvesting (U.S. Fish and Wildlife Service 2007). Recent drought and apparent climate change are contributing to habitat degradation within the range of this species in the action area. For instance, the montane woodlands at the higher elevations (Santa Rita, Santa Catalina, and Huachuca mountains) have all experienced drought and associated large-scale catastrophic wildfires in recent years that have severely altered habitat and results in an increase in the importance of remaining lesser long-nosed bat habitat. The Baboquivari Mountains, which are in proximity to the proposed action, have also experienced impacts to lesser long-nose bat habitat resulting from drought and fire.

We expect the lesser long-nosed bat to be impacted both directly and indirectly by the proposed IFT project. Short-term, direct impacts of construction, operation, and maintenance activities on the bat or its habitats (including maternity colonies, roosting sites, foraging areas, and areas between known maternity colonies/roosting sites and foraging areas) include disturbance from temporary noise associated with construction equipment and helicopter operations, and disturbance from artificial lights used for nighttime construction. Long-term direct impacts could occur if roost sites are located in proximity to any of the proposed towers or access roads. Long-term, indirect impacts include human disturbance from increased public access facilitated by construction and maintenance of new and repaired roads, increased fire risk associated with increased public access, and an increase of non-native invasive plants associated with disturbance of native habitats.

Long-term indirect effects to two known lesser long-nosed bat maternity roosts may occur due to shifts in illegal border traffic and interdiction efforts to the west as a result of the proposed action. The Copper Mountain and Bluebird roost sites could potentially be subjected to increased border traffic and interdiction efforts if such traffic that currently occurs on the TON is shifted west in response to the construction of the proposed towers. Such indirect effects to maternity roosts may have population level effects to this species.

Land clearing associated with construction of the towers, staging areas, new roads, and road repairs, may result in loss of foraging habitat. As noted above, the lesser long-nose bat feeds on the nectar, pollen, and fruit produced by columnar cacti (saguaro and organ pipe) and pollen of various agave species. While bats have been documented flying many miles to locate patches of blooming cacti and agaves, there is an energetic cost to such flights that must be accounted for in the density and quality of the nectar source (U.S. Fish and Wildlife Service 2007).

Preferentially, significant nectar sources would be located in proximity to roosts. Since the quality of blooming may vary between days, weeks, and, over the course of years, sufficient

foraging habitat must be present and accessible around both maternity and summer roosts. Loss of suitably dense, healthy patches of cacti or agaves is a loss of foraging opportunity for the bat. The large columnar cacti that produce bat pollinated flowers are mature survivors of past reproductive events, and while these plants are long-lived, there must be successful recruitment of young cacti to the population if it is to persist. Actions that reduce the recruitment rate have long-term effects, particularly if followed by a die-off of adult cacti due to fire or freezing. It is not known how long it would take to restore a mature saguaro stand, but the estimates, assuming that conditions are right for recruitment and there is a seed base, are on the order of decades. Similarly, while agaves have a shorter life span, each plant only produces one flower stalk once in its life, and if that stalk is destroyed before it matures to blossom, it is not available to the bats. Over time, a single agave clone can provide flowering stocks over a number of years, but if land use practices or accidents eliminate the clone, there is no future use. Destruction of too many clones in an area may result in another long period without sufficient forage opportunities for the bats.

We recommend the following measures be considered for inclusion in the design of the proposed IFT project in order to reduce the potential impacts to lesser long-nosed bats: 1) minimize impacts to vegetation. In addition to providing forage, washes and other heavily vegetated areas may provide movement corridors for lesser long-nosed bats; 2) minimize the extent and width of roads associated with the proposed IFT project in order to reduce the likelihood of impacts to forage species; 3) work with the TON to control access to roads associated with the proposed towers; 4) locate staging areas at sites where vegetation disturbance will be minimized; 5) avoid impacts to all saguaros and agaves (if such impacts are unavoidable, we recommend transplanting them or replacing them with nursery stock at a 3:1 ratio in locations proximate to the project area); 6) limit construction activities during the night and reduce or eliminate any nighttime lighting associated with the proposed project; and 7) survey any potential lesser long-nosed bat roost habitat within 0.5 mile of any proposed tower or access road for the presence of lesser long-nosed bats and, if found, avoid disturbance or impacts to these roosts.

Sonoran Pronghorn

The Sonoran subspecies of pronghorn (*Antilocapra americana sonoriensis*) was first described by Goldman (1945) and is the smallest of the four subspecies of pronghorn (Nowak and Paradiso 1983, Brown and Ockenfels 2007). The subspecies was listed throughout its range as endangered on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 without critical habitat. Three sub-populations of the Sonoran pronghorn are extant: 1) a U.S. sub-population in southwestern Arizona, 2) a sub-population in the Pinacate Region of northwestern Sonora, and 3) a sub-population on the Gulf of California west and north of Caborca, Sonora. The three sub-populations are predominantly geographically isolated due to barriers such as roads and fences, and, in the case of the two Sonora sub-populations, by distance. The Sonoran pronghorn potentially occurs in the western portion of TON lands.

The 1982 Sonoran Pronghorn Recovery Plan (FWS 1982) was revised in 1998 (FWS 1998). The recovery criteria presented in the revised plan entailed the establishment of a population of 300 adult pronghorn in one self-sustaining population for a minimum of five years, as well as the

establishment of at least one other self-sustaining population in the U.S. to reclassify the subspecies to threatened. Actions identified as necessary to achieve these goals include the following: 1) enhance present sub-populations of pronghorn by providing supplemental forage and/or water; 2) determine habitat needs and protect present range; 3) investigate and address potential barriers to expansion of presently used range and investigate, evaluate, and prioritize present and potential future reintroduction sites within historical range; 4) establish and monitor a new, separate herd(s) to guard against catastrophes decimating the core population, and investigate captive breeding; 5) continue monitoring sub-populations and maintain a protocol for a repeatable and comparable survey technique; and 6) examine additional specimen evidence available to assist in verification of taxonomic status. In 2002, a supplement and amendment to the 1998 Final Revised Sonoran Pronghorn Recovery Plan was prepared (FWS 2002). The FWS concluded that data do not yet exist to support establishing delisting criteria. Tasks necessary to accomplish reclassification to threatened status (as outlined in the 1998 plan) should provide the information necessary to determine if and when delisting will be possible and what the criteria should be. Survival of the Sonoran pronghorn is precarious and is likely dependent on drastic and untested methods (Krausman et al. 2005). The Sonoran Pronghorn Recovery Plan is currently being updated by a bi-national recovery team. In all planning related to Sonoran pronghorn recovery, we have concluded that, in order for recovery actions to be effective, providing an environment of reduced impacts related to anthropogenic activities is essential.

Sonoran pronghorn inhabit one of the hottest and driest portions of the Sonoran Desert. They forage on a large variety of perennial and annual plant species (Hughes and Smith 1990, Hervert et al. 1997a, FWS 1998). During drought years, Hughes and Smith (1990) reported cacti were the major dietary component (44 percent). Consumption of cacti, especially chain fruit cholla (*Cylindropuntia fulgida*, Pinkava 1999), provides a source of water during hot, dry conditions (Hervert et al. 1997a). Other important plant species in the diet of the pronghorn include pigweed (*Amaranthus palmeri*), ragweed (*Ambrosia* sp.), locoweed (*Astragalus* sp.), brome (*Bromus* sp.), and snakeweed (*Gutierrezia sarothrae*) (FWS 1998). Pronghorn will move in response to spatial limitations in forage availability (Hervert et al. 1997b). Water intake from forage is not adequate to meet minimum water requirements (Fox et al. 2000), hence pronghorn need, and readily use, both natural and artificial water sources (Morgart et al. 2005).

Historically, the Sonoran pronghorn ranged in the U.S. from approximately the Santa Cruz River in the east, to the Gila Bend and Kofa Mountains to the north, and to Imperial Valley, California, to the west (Mearns 1907, Nelson 1925, Monson 1968, Wright and deVos 1986, Paradiso and Nowak 1971; Figure 6). Bright et al. (2001) defined the present U.S. range of the Sonoran pronghorn as bordered by Interstate 8 to the north, the International Border to the south, the Copper and Cabeza mountains to the west, and State Route (SR) 85 to the east. This area encompasses 2,508 square miles (Bright et al. 2001). Sonoran pronghorn are estimated to be currently limited to < 25% of their historical habitat in Arizona and northern Sonora, Mexico (Krausman et al. 2005). A second U.S. population, considered non-essential and experimental, was recently established at Kofa NWR.

Although the U.S. Sonoran pronghorn population has increased significantly since the severe drought and Sonoran pronghorn population decline of 2002, the increase is not as great as the

Sonoran Pronghorn Recovery Team (Team) had predicted given the generally improved rainfall conditions since 2002, as well as tremendous multi-agency recovery efforts, including providing waters and forage enhancement plots, implementing seasonal restrictions on public access to pronghorn habitat during the critical fawning season, and a captive breeding program. The Team has suggested a number of reasons for this, including high cross border activity, drought, and deterioration of forage conditions beyond what is compensated for with the implementation of recovery actions. Information provided by land managers in OPCNM suggest off-road vehicle tracks have been seen progressively increasing in extent and density since 2002, throughout that portion of the pronghorn's range U.S. range (electronic mail from Tim Tibbitts, OCPNM and member of the Sonoran Pronghorn Recovery Team, September 21, 2009). It has been well documented that human presence in wildlands can disturb animals, causing them to unnecessarily expend energy avoiding people, thereby potentially reducing reproductive success (e.g., Manville 1983, van Dyke et al. 1986, Goodrich & Berger 1994, Primm 1996; as cited by Kerley et al. 2002) or increasing the likelihood of fatal encounters with humans (Kasworm and Manley 1990, Saberwal et al. 1994, Khramtsov 1995, Mattson et al. 1996; as cited by Kerley et al. 2002).

The slow rebound of the wild U.S. pronghorn population to numbers more in line with historical levels since the 2002 population decline is considered by some Team members to be evidence that human disturbance continues to affect the population, inhibiting its ability to recover. However, it is important to note that pronghorn are likely more resilient to impacts associated with human disturbance and similar stressors during periods of increased rainfall and resultant improved condition of forage and water resources. Unfortunately, in recent times, these periods have occurred less often and their occurrence is unreliable. Therefore, in our best professional judgment and based on current observations and predicted climate changes, it is likely that the effects of human disturbance and similar stressors on Sonoran pronghorn will be exacerbated by generally poor habitat conditions during the implementation of the proposed action, although periods of normal or above precipitation are expected to occur throughout the life of this project. Supplemental water and forage resources will likely continue to be of extreme importance to maintaining and improving Sonoran pronghorn populations in the U.S., particularly during times of drought and exposure to stressors such as human disturbance. With efforts to improve forage and water availability and the release of individuals from the captive pens, we are starting to see an improving population trend

While there are no substantiated recent occurrences of Sonoran pronghorn on TON lands, there are several anecdotal reports of occurrence in the northwestern portions of TON lands. In addition, as the Sonoran pronghorn population is augmented with individual pronghorn from the captive breeding pens, these new individuals have recently been using the area east of Highway 85 in Organ Pipe Cactus National Monument where pronghorn have not been found for many years. There is an increased potential for pronghorn to move to the western portions of the TON from this area east of Highway 85. TON lands are also within the identified 10(j) (non-essential, experimental population) area for Sonoran pronghorn reintroductions and population expansion. We believe that it is unlikely that TON lands are currently occupied by Sonoran pronghorn and, therefore, there is limited potential for direct effects to Sonoran pronghorn to occur as a result of the proposed action. In addition, because TON lands are within the 10(j) area, any occupancy of

the area by Sonoran pronghorn would fall under the regulatory guidelines of the 10 (j) population (76 FR 25593). Impacts from the proposed action to any pronghorn that occupy the project area in the future would need to be evaluated under the 10 (j) regulations.

However, the proposed action is likely to affect pronghorn that currently occupy the area to the west of TON lands. We believe that there is a the potential for indirect effects to occur affecting pronghorn that currently occupy Organ Pipe Cactus National Monument and the Cabeza Prieta National Wildlife Refuge due to a shift west of illegal border traffic and interdiction efforts resulting from the installation of the proposed towers on TON lands. These indirect effects may need to be analyzed through formal section 7 consultation.

Indirect effects and disturbance to Sonoran pronghorn and degradation of their habitat as a result of the project will primarily occur within OPCNM, BLM, and CPNWR, all of which are key areas to the survival and recovery of the U.S. population of pronghorn. CPNWR contains essential Sonoran pronghorn areas including fawning habitat, forage enhancement plots, and pronghorn water sites, as well as a semi-captive breeding pen in Child's Valley. OPCNM is also an essential area for pronghorn, particularly during the fawning period and annual spring warming-drying trend (i.e., pronghorn use OPCNM under conditions of greatest thermal and hydration stress). BLM lands north of OPCNM and east of CPNWR are also important to Sonoran pronghorn and include water sites. Additionally, a Sonoran pronghorn forage enhancement plot is proposed on BLM lands. Anecdotal evidence suggests that Sonoran pronghorn avoid and may abandon areas of high human activity, and that this behavior has led to fawn mortality, as is thought to be the case with pronghorn abandonment of the Granite Forage Enhancement Plot. If a shift in border activity to the west, away from TON lands, occurs as a result of the proposed action, this increase in border activity has the potential to reduce or eliminate the value of existing and proposed recovery actions for the Sonoran pronghorn. This is particularly true for CPNWR where there are no towers resulting in this area that is important for pronghorn conservation being vulnerable to impacts from shifting border traffic, while areas on OPCNM and the TON have tower coverage.

The proposed action may have a long-term beneficial effect on Sonoran pronghorn within the 10 (j) area if it results in greater effective control of the border leading to eventual decreased CBV and USBP activity in the project area. However, based on input received from land managers in the area of the Ajo-1 Tower project, this has not been the case. In fact, it appears as if there has been an increase of activity associated with border apprehensions and patrols [pers. communication with T. Tibbitts (OPCNM) and J. Atkinson (CPNWR); 7/9/13].

USBP patrol and interdiction activities (by vehicle, aircraft, foot, and/or horseback, including dragging operations) as a part of the project are anticipated to result in significant disturbance to pronghorn. Observations associated with the Ajo-1 tower project by land managers indicate that enforcement efforts are often focused in the areas of the towers [pers. comm. with T. Tibbitts (OPCNM) and J. Atkinson (CPNWR); 7/9/13]. If this pattern continues, the proposed action is likely to increase patrol and interdiction activities in the area of the proposed towers, potentially impacting pronghorn that may become established in the 10(j) area. As described above, this

disturbance can cause pronghorn to startle and/or flee, travel further distances to find suitable foraging, watering, and resting areas, and result in stress and short- and long-term denial of access to habitat, all of which can result in adverse physiological effects, injury to, or mortality of pronghorn. Fleeing behavior can cause fawns to be abandoned or separated from their mothers, which can leave them vulnerable to predator attack or cause physiological stress that results in death. Although requirements for ESA section 7 consultation for Federal agencies are reduced for 10(j) populations, we are available to coordinate with CBP and the TON with regard to actions and measures that can be taken within the 10(j) area to reduce impacts to pronghorn and enhance conservation of this species if pronghorn become established in the project area in the future.

We recommend the following measures be considered for inclusion in the design of the proposed IFT project in order to reduce the potential impacts to Sonoran pronghorn: 1) use biological monitors during the construction of the proposed towers and access roads to monitor for the occurrence of Sonoran pronghorn in proximity to construction areas. If Sonoran pronghorn are observed in an area prior to construction activities or in proximity to roads being used by construction vehicles, we recommend that activities be delayed until the pronghorn have moved out of the area; 2) construct towers in as close proximity to the U.S. Mexico border as is feasible. This will contribute to apprehending border crossers close to the border and reduce potential disturbance of pronghorn, including pronghorn that may become established in the future with the 10(j) area, and recovery infrastructure further west. We are supportive of tower locations as close to the border as possible. It appears that the proposed towers are in closer proximity to the border than for previous tower projects; 3) work with the TON to control access to roads associated with the proposed towers; and 4) monitor border activities west of TON lands during construction and operation of the proposed towers. Work with land managers to assess any increase in intensity or extent of border activities in relation to known Sonoran pronghorn use areas, water sources, forage enhancement plots, captive breeding pens, and other recovery actions that may be the result of shifts in border traffic resulting from the proposed action. Coordinate with land managers to develop a response to such shifts in border activity to address impacts to Sonoran pronghorn and recovery actions.

Sonoran Desert Tortoise

The Sonoran desert tortoise is listed as a candidate species under the Act. A nationwide legal settlement (multi-district litigation settlement (MDL)) places a deadline to resolve the listing status of this species by Fiscal Year 2015. The Sonoran desert tortoise occupies the majority of the proposed IFT project area.

Adult Sonoran desert tortoises range in length from 8 to 15 inches (in), with a relatively high domed shell, usually brownish with a pattern and prominent growth lines. The plastron (bottom shell) is yellowish and is not hinged. The hind limbs are very stocky and elephantine; forelimbs are flattened for digging and covered with large conical scales. Males are differentiated from females by having elongated gular (throat) shields, chin glands visible on each side of the lower jaw (most evident during the breeding season), a concave plastron, and larger overall size.

Sonoran desert tortoises are most closely associated with the Arizona Upland and Lower Colorado River subdivisions of Sonoran desertscrub and Mojave desertscrub vegetation types and, to a lesser extent, other habitat types within their range and elevation parameters. They occur most commonly on rocky, steep slopes and bajadas (lower mountain slopes) often formed by the coalescing of several alluvial fans and in paloverde-mixed cacti associations. Washes and valley bottoms may be used in dispersal. Sonoran desert tortoises in Arizona occur between 904 to 4,198 feet in elevation.

Historically, Sonoran desert tortoises were found in suitable habitat south and east of the Colorado River in Arizona in all counties except for Navajo, Apache, Coconino, and Greenlee counties, and south to the Rio Yaqui in southern Sonora, Mexico. Historical core populations remain extant in Arizona. Concerns for population genetics exist due to habitat fragmentation and barriers (roads, urban development, canals, railroads, etc.) in valley bottoms used for dispersal and exchange of genetic material. Currently occupied range in Mexico is less understood.

Threats to the Sonoran desert tortoise include nonnative plant species invasions and altered fire regimes; urban and agricultural development; barriers to dispersal and genetic exchange; off-highway vehicles; roads and highways; historical ironwood and mesquite tree harvest in Mexico; improper livestock grazing (predominantly in Mexico); undocumented human immigration and interdiction activities; illegal collection; predation from feral dogs; human depredation and vandalism; drought; and climate change.

The proposed action has the potential to directly and indirectly affect the Sonoran desert tortoise. Direct effects include the loss of and fragmentation of habitat, as well as the potential for direct mortality through construction activities and road mortality from vehicle collisions during construction and operation of the towers. Construction of new access roads and increased use of new and existing roads will contribute to the potential for these effects. Indirect effects could occur from increased occurrence of invasive species and associated fires, and an increased potential for fire from operations and increased use of roads. There is also the potential for illegal collection of tortoises.

We recommend the following measures be considered for inclusion in the design of the proposed IFT project in order to reduce the potential impacts to Sonoran desert tortoises: 1) conduct surveys for Sonoran desert tortoise prior to implementation of the proposed project and avoid impacts to occupied areas; 2) use biological monitors during the construction of the proposed towers and access roads to monitor for the occurrence of Sonoran desert tortoise in proximity to construction areas. If Sonoran desert tortoise are observed in the construction area, follow the attached Arizona Game and Fish Department (AGFD) Guidelines for Handling Tortoises to move the tortoise(s) out of harm's way; 3) check the immediate area around construction vehicles and equipment prior to operation to determine the presence of any tortoises and move them according to the AGFD guidelines; 4) minimize impacts to plant communities and existing topography and drainages. These are important habitat elements relate to forage, movement and

shelter for the tortoise; 5) minimize the extent and width of roads associated with the proposed IFT project in order to reduce the likelihood for road mortality and impacts to tortoise habitat; 6) work with the TON to control access to roads associated with the proposed towers; 4) locate staging areas at sites where vegetation disturbance will be minimized; and 5) provide outreach and education to individuals involved in the construction and operation of the proposed towers with regard to the laws and regulations related to the collection of Sonoran desert tortoises, and to increase their awareness for the potential for vehicle collisions with tortoises.

Cactus Ferruginous Pygmy-owl

The project area also includes habitat for the pygmy-owl. The pygmy-owl was originally listed as an endangered species in 1997. Following a series of litigation actions, a final rule to remove the pygmy-owl from the Endangered Species list was published April 14, 2006. The pygmy-owl remains a species of conservation concern for the FWS. Currently in Arizona, the pygmy-owl is found only in portions of Pima and Pinal Counties. The Arizona Breeding Bird Atlas reports confirmed occurrences of the pygmy-owl in only three blocks distributed in Pima and Pinal Counties (Arizona Breeding Bird Atlas (ABBA) 2005, p. 219). Twelve other blocks recorded probable (3) or possible (9) occurrences, but none occurred outside of Pima and Pinal Counties (ABBA 2005, p. 219). Recent surveys indicate that probably fewer than 50 adult pygmy-owls exist in the state, with 10 or fewer nest sites on an annual basis (Abbate *et al.* 2000, pp. 15–16, AGFD unpublished data). However, since the pygmy-owl was delisted in 2006 (71 FR 194521; April 14, 2006), surveys, monitoring, and other research on pygmy-owls has declined. Limited survey and monitoring in Arizona from 2009 to 2013 documented that pygmy-owls still occupy historical locations in the Altar Valley, Avra Valley, and Organ Pipe Cactus National Monument, all within Pima County (Service 2009, p. 1; Tibbitts 2011, p. 1; Service 2011, p. 1). Comprehensive surveys have not been conducted on TON lands, which is located in the central portion of both the historical and current distribution of pygmy-owls in Arizona. However, a number of surveys have been completed for various utility projects on the Nation, and the pygmy-owl is known to occur there. Distribution of the data from these surveys has been restricted by the Nation and is not available for analysis. There are large areas of suitable habitat on the Nation, but the information we have indicates that pygmy-owls are patchily distributed, just as in other areas of the State, and occur at similar densities.

In Arizona, pygmy-owls rarely occur below 300 meters (m) (1,000 feet (ft)) or above 1,200 m (4,000 ft) (Proudfoot and Johnson 2000, p. 5), except perhaps during dispersal (AGFD 2008, p. 3). Historically, in Arizona, the pygmy-owl nested in Fremont cottonwood-mesquite forests and mesquite bosques (woodlands) associated with major drainages and their tributaries and the subspecies is considered by some to be a preferential riparian nesting species. The pygmy-owl in Arizona also occupies upland Sonoran desert scrub, often associated with xeroriparian areas. Species associated with these areas are *Prosopis* spp. (mesquite), *Parkinsonia* spp. (palo verde), *Acacia* spp. (acacia), *Olneya tesota* (ironwood), and *Carnegiea gigantea* (saguaro cactus) (Proudfoot and Johnson 2000, p. 5).

The patchy, dispersed nature of the pygmy-owl populations in Arizona and Mexico (Flesch 2003) suggests that the overall population may function as a metapopulation. A metapopulation is a set of subpopulations within an area, where movement and exchange of individuals among population segments is possible, but not routine. A metapopulation's persistence depends on the combined dynamics of the productivity of subpopulations, the maintenance of genetic diversity, the availability of suitable habitat for maintenance and expansion of subpopulations, and the "rescue" of subpopulations that have experienced local extinctions by the subsequent recolonization of these areas by dispersal from adjacent population segments (Hanski and Gilpin 1991, 1997). The local groups of pygmy-owls within Arizona may function as subpopulations within the context of metapopulation theory. However, more information is needed regarding the population dynamics of pygmy-owls in Arizona.

We anticipate that the proposed action will both directly and indirectly affect the pygmy-owl. Direct effects include the loss and fragmentation of habitat and impacts to nesting pygmy-owls from disturbance if construction or operation activities occur in proximity to active nests. One specific direct effect to pygmy-owl nests would be the removal of saguaros during construction. Saguaros provide nest sites for the pygmy-owl. Indirect effects include increased potential for the occurrence of invasive species and associated fires, and the increased potential for fire and human activity disturbance associated with increased access to the area.

We recommend the following measures be considered for inclusion in the design of the proposed IFT project in order to reduce the potential impacts to cactus ferruginous pygmy-owls: 1) conduct surveys for cactus ferruginous pygmy-owls prior to implementation of the proposed project and avoid impacts to occupied areas; consider seasonal restriction of activities to avoid disturbing pygmy-owls during the nesting season. Avoid working during the nesting season if work will occur within one half mile of a nest site. Please coordinate this effort with the TON Wildlife and Vegetation Management Program; 2) use biological monitors during the construction of the proposed towers and access roads to ensure that saguaros are avoided, transplanted, or replaced. Saguaros provide nest sites for pygmy-owls and are also culturally significant to the Tohono O'odham people; 3) minimize impacts to plant communities. These provide important habitat elements for the pygmy-owl related to forage, movements, cover, and nesting; 4) minimize the extent and width of roads associated with the proposed IFT project in order to reduce the habitat loss and fragmentation; 5) work with the TON to control access to roads associated with the proposed towers; and 6) locate staging areas at sites where vegetation disturbance will be minimized.

Should project plans change or if additional information on the distribution of listed or proposed species becomes available, we recommend that you contact our office to determine if additional concerns or issues need to be considered. We encourage your continued coordination with the Tohono O'odham Nation's Wildlife and Vegetation Management Program as this project is implemented. In keeping with our trust responsibilities to American Indian Tribes, by copy of this letter, we will notify the Tohono O'odham Nation, which may be affected by the proposed action. We encourage you to invite the Bureau of Indian Affairs to participate in the review of

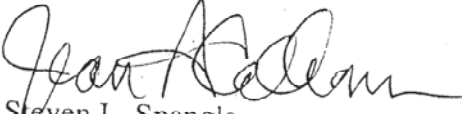
Ms. Mary D. Hassell

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your proposed action. We also encourage you to coordinate with AGFD to identify and resolve potential issues under the authority of that agency and that may result from the proposed action.

Should you require further assistance or if you have any questions, please contact Scott Richardson at (520) 670-6150 (x242) or Jean Calhoun (x223). Thank you for your continued efforts to conserve endangered species.

Sincerely,


for Steven L. Spangle
Field Supervisor

Enclosure

cc (hard copies / with enclosure):

Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2 copies)

Jean Calhoun, Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

cc (electronic copies / with enclosure):

Customs and Border Protection, Washington D.C (Attn: Sharon Sharp-Harrison)

Tohono O'odham Nation Wildlife and Vegetation Management Program, Sells, AZ
(Attn: Karen Howe)

Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ
(Attn: John Windes)

pep@azgfd.gov, Habitat Branch, Arizona Game and Fish Department, Phoenix, Arizona

DOI Border Coordinator, Phoenix, AZ (Attn: Kathy Pedrick)

CBP DOI Liaison, Washington D.C. (Attn: Jon Andrew)

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GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES
ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department

Revised October 23, 2007

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran population of desert tortoises occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40° Celsius (105° Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 40° Celsius (105° Fahrenheit), the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

These guidelines do not apply to the Mojave population of desert tortoises (north and west of the Colorado River). Mojave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.

These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.

Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.



September 19, 2013

Ms. Nina Siquieros
Superintendent
Bureau of Indian Affairs, Papago Agency
Environmental Quality Services
2600 North Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3008

Dear Ms. Siquieros:

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) would like to invite the Bureau of Indian Affairs (BIA), Papago Agency to be a cooperating agency for the development of an environmental assessment (EA) for the proposed Integrated Fixed Towers (IFT) within the Chukut Kuk and Gu-Vo District of the Tohono O'odham Nation. CBP has also contacted the Tohono O'odham Nation to request their participation as a cooperating agency for this undertaking.

On May 9, 2013 the Tohono O'odham Legislative Council passed Resolution #13-142, *Authorizing the U.S. Customs and Border Protection to Conduct Environmental Assessments, and Conduct Pre-Development Activities for the Proposed Integrated Fixed Tower Program in Accordance with the Laws of the Nation and the United States.*

CBP is preparing a National Environmental Policy Act (NEPA) document to adequately identify resource impacts and any potential mitigation to ensure resource protection where necessary. CBP is ultimately responsible for assuring compliance with the requirements of NEPA, the Endangered Species Acts of 1973 as amended, the National Historic Preservation Act of 1966 as amended, and the Archeological and Historical Preservation Act of 1974.

As a cooperating agency, we are requesting the Papago Agency cooperate and provide input, review, and comments in the development of the Environmental Assessment (EA) to ensure the document meets the needs of the Papago Agency and the BIA. As the lead Federal agency for this undertaking, CBP will solely be responsible for signing and distributing the final EA and Finding of No Significant Impact (FONSI).

We request that BIA advise OTIA that they have agreed to be a Cooperative Agency and agree to comply with the current schedule (subject to change) for review of our NEPA documents. We can provide you with the current schedule for discussion at our conference call.

Ms. Nina Siquieros, Page 2

Should you have any additional questions or concerns about this project please contact me at (949) 425-7081 or email at charles.h.parsons@cbp.dhs.gov. We look forward to working with you on this project.

Sincerely,



Charles H. Parsons, PG
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
24000 Avila Road, Suite 5020
Laguna Niguel, CA 92677

Copies:

Amy Heuslein
Branch Chief
Bureau of Indian Affairs, Papago Agency
Environmental Quality Services
2600 North Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3008

Bernadette Blackwater
Tohono O'odham Nation
Planning & Economic Development Department
Realty Office
P.O Box 837
Sells, Arizona 85634

Enclosure: Figure 1. Proposed IFT Tower Locations

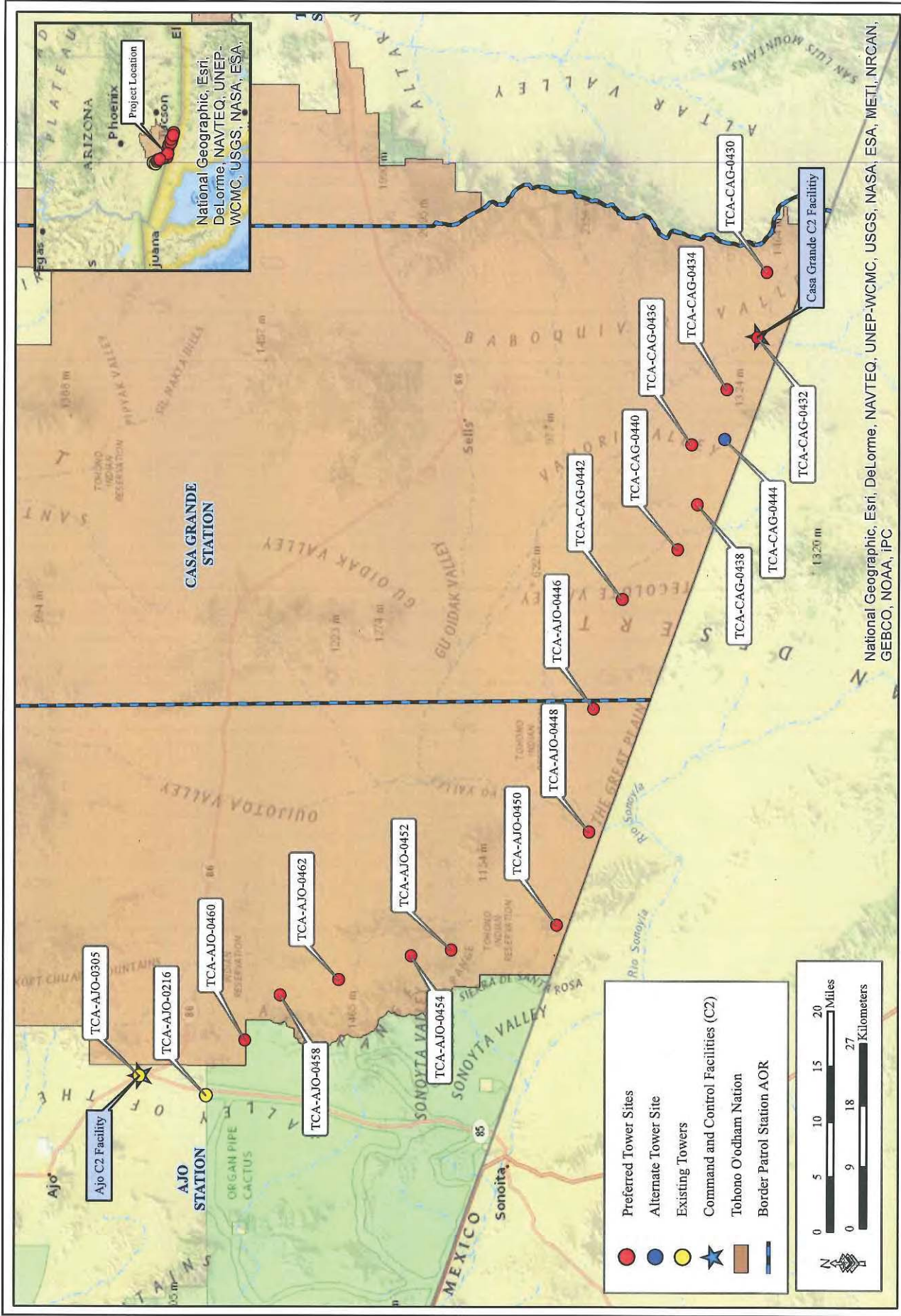


Figure 1. IFT Proposed Tower Locations - Ajo and Casa Grande Stations



September 19, 2013

Peter Steere
Tribal Historic Preservation Officer
Tohono O'odham Nation
Cultural Center Museum
Fresnal Canyon Road & BIA Indian Route 19
Topawa, AZ 85639

RE: Revised Draft Cultural Resources Inventory in Support of Integrated Fixed Towers on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Arizona. Contract Number W9126G-09-D-0067, Delivery Order 0060

Mr. Steere:

Please find enclosed and one (1) hard copy and one (1) electronic copy of the revised draft cultural resources survey report for the proposed Integrated Fixed Towers, as referenced above, for your review and comment. Revisions to the report were made as a result of comments received on the draft report, comments received during site visits with Chukut Kuk and Gu-Vo District representatives on 12 and 26 August, 2013, and new information received after the draft report was completed. Please provide GSRC with Tohono O'odham Nation site numbers for the sites with Field Site (FS) numbers. The official numbers will replace the FS numbers for the final report.

Please do not hesitate to call me at (949) 425-7081 or contact me at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles H. Parsons".

Charles Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Charles McGregor



U.S. Customs and
Border Protection

September 30, 2013

Garry J. Cantley
Regional Archeologist
Bureau of Indian Affairs
Western Regional Office
Environmental Quality Services
2600 North Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3008

RE: Revised Draft Cultural Resources Inventory in Support of Integrated Fixed Towers on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Arizona. Contract Number W9126G-09-D-0067, Delivery Order 0060

Mr. Cantley:

Please find enclosed and one (2) hard copies and two (2) electronic copies of the revised draft cultural resources survey report for the proposed Integrated Fixed Towers, as referenced above, for your review and comment. Please do not hesitate to call Charles Parsons at (949) 425-7081 or by e-mail at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles H. Parsons".

Charles H. Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Charles McGregor (USACE), letter only
cc: Amy Heuslein (BIA), letter only



United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
PAPAGO AGENCY
P.O. Box 490
Sells, Arizona 85634



IN REPLY REFER TO:

Office of the Superintendent

SEP 25 2013

Charles H. Parsons, PG
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Office of Technology Innovation & Acquisition
24000 Avila Road, Suite 5020
Laguna Niguel, California 92677

Re.: Integrated Fixed Towers Environmental Assessment, Tohono O'odham Nation

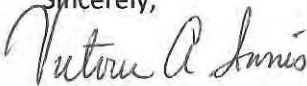
Mr. Parsons:

Thank you for your invitation dated September 19, 2013 for the Bureau of Indian Affairs (BIA) Papago Agency to be a cooperating agency for the proposed Integrated Fixed Towers (IFT) Environmental Assessment (EA).

BIA appreciates your invitation to be a cooperating agency and accepts as we have: (1) special expertise (40 CFR 1508.26) we can offer to assist in the preparation and review of the EA and (2) jurisdiction by law (40 CFR 1508.15) through the issuance of permanent easements, temporary construction easements, leases, permits, etc. that are required for the IFT. Please keep us apprised of scoping activities, public comments, meetings, etc. so that we can have these recorded in our project files.

We look forward to working with you in a collaborative effort that will satisfy the requirements of both our agencies.

If you have any questions, please contact Nina Siquieros, Superintendent at 520/383-3286 or via email at nina.siquieros@bia.gov. Alternatively, you may reach Amy Heuslein, Regional Environmental Protection Officer, BIA Western Regional Office (WRO), at 602/379-6750 or by email at amy.heusein@bia.gov.

Sincerely,

Acting Superintendent

cc: Bernadette Blackwater, TON Realty
Amy Heuslein, BIA/WRO/MS-620EQS
File

ACTIVITIES MGMT & ENV
LAGUNA NIGUEL, CA

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RECEIVED
U.S. DEPARTMENT OF
HOMELAND SECURITY



U.S. Customs and
Border Protection

November 15, 2013

The Honorable Ned Norris, Jr., Chairman
Tohono O'odham Nation
Main Street, Building #49
Sells, AZ 85634

Dear Chairman Norris:

The Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) would like to invite the Tohono O'odham Nation to be a cooperating agency for the development of an environmental assessment (EA) for the proposed Integrated Fixed Towers (IFT) within the Chukut Kuk and Gu-Vo District of the Tohono O'odham Nation. CBP has also contacted the Bureau of Indian Affairs (BIA), Papago Agency, and the BIA Western Regional Office to request their participation as cooperating agencies for this undertaking. CBP and BIA have agreed to be cooperative agencies.

On May 9, 2013, the Tohono O'odham Legislative Council passed Resolution #13-142, *Authorizing the U.S. Customs and Border Protection to Conduct Environmental Assessments, and Conduct Pre-Development Activities for the Proposed Integrated Fixed Tower Program in Accordance with the Laws of the Nation and the United States.*

CBP is preparing a National Environmental Policy Act (NEPA) document to adequately identify resource impacts and any potential mitigation to ensure resource protection where necessary. CBP is ultimately responsible for assuring compliance with the requirements of NEPA, the Endangered Species Acts of 1973 as amended, the National Historic Preservation Act of 1966 as amended, and the Archeological and Historical Preservation Act of 1974.

As a cooperating agency, we are requesting that the Tohono O'odham Nation cooperate and provide input, review, and comments in the development of the EA to ensure the document meets the needs of the Tohono O'odham Nation. As the lead Federal agency for this undertaking, CBP will solely be responsible for signing and distributing the final EA and Finding of No Significant Impact (FONSI).

We request that the Tohono O'odham Nation advise OTIA that they have agreed to be a Cooperative Agency and agree to comply with the current schedule (subject to change) for review of our NEPA documents. We can provide you a copy of our current schedule upon request.

Chairman Ned Norris

Page 2

Should you have any additional questions or concerns about this project please contact me at (949) 643-6383 or email at charles.h.parsons@cbp.dhs.gov. We look forward to working with you on this project.

Sincerely,



Charles H. Parsons, P.G.
Acting Environmental Branch Chief
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition
24000 Avila Road, Room 5020
Laguna Niguel, California 92677

cc:

Bernadette Blackwater, Tohono O'odham Nation
Karen Howe, Tohono O'odham Nation
Peter Steere, Tohono O'odham Nation
Garry Cantley, Bureau of Indian Affairs (BIA)
Tamera Dawes, BIA
Amy Heuslein, BIA
Charles "Chip" Lewis, BIA
Elizabeth Listo, BIA
Nina Siquieros, BIA
Stan Webb, BIA

Sherry Ethell

From: Sherry Ethell
Sent: Friday, April 18, 2014 9:27 AM
To: Sherry Ethell
Subject: FW: Comments on Archaeological Report for BP Tower Sites

From: Peter Steere [<mailto:Peter.Steere@tonation-nsn.gov>]
Sent: Friday, January 17, 2014 10:31 AM
To: PARSONS, CHARLES H (CHARLES.H.PARSONS@CBP.DHS.GOV)
Cc: Dave Hart
Subject: Comments on Archaeological Report for BP Tower Sites

MEMORANDUM

DATE: January 16, 2014
TO: Charles Parson, Department of Homeland Security
FROM: Peter I. Steere, THPO, Tohono O'odham Nation
RE: Comments on Archaeological Report of USBP Towers on the Tohono O'odham Nation

The Tribal Historic Preservation Office of the Tohono O'odham Nation has no additional comments on this report.

We believe all issues have been resolved during discussions of our office with GSRC and during field visits at several times

In the past 6 months.

Issues relating to monitoring during actual construction have all been resolved.



February 7, 2014

Peter Steere
Tribal Historic Preservation Officer
Tohono O'odham Nation
Cultural Center Museum
Fresnal Canyon Road & BIA Indian Route 19
Topawa, AZ 85639

FEB 03 2014

RE: Final Cultural Resources Inventory in Support of Integrated Fixed Towers on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Arizona. Contract Number W9126G-09-D-0067, Delivery Order 0060

Mr. Steere:

Please find enclosed and three (3) hard copies and one (1) electronic copy of the final cultural resources survey report for the proposed Integrated Fixed Towers, as referenced above.

Please do not hesitate to call me at (949) 643-6383 or contact me at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles H. Parsons".

Charles H. Parsons, P.G.
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Charles McGregor

Enclosure



FEB 10 2014

February 7, 2014

Ms. Amy Heuslein
Bureau of Indian Affairs
Western Regional Office
Environmental Quality Services
2600 North Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004-3008

RE: Final Cultural Resources Inventory in Support of Integrated Fixed Towers on the Tohono O'odham Nation, U.S. Border Patrol, Tucson Sector, Arizona. Contract Number W9126G-09-D-0067, Delivery Order 0060

Ms. Heuslein:

Please find enclosed and one (1) hard copy and one (1) electronic copy of the final cultural resources survey report for the proposed Integrated Fixed Towers, as referenced above.

Please do not hesitate to call me at (949) 643-6383 or contact me at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles Parsons".

Charles Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Garry Cantley
Charles McGregor

Enclosure



U.S. Customs and
Border Protection

Mr. Steve Spangle, Field Supervisor
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4915

MAR 05 2014

RE: Proposed Integrated Fixed Towers on the Tohono O'odham Nation in the U.S. Border Patrol's Ajo and Casa Grande Stations' Areas of Responsibility, Tucson Sector, Arizona

Dear Mr. Spangle:

The U.S. Customs and Border Protection (CBP), Office of Technology Innovation and Acquisition (OTIA) is pleased to forward the *Final Biological Assessment for the Proposed Integrated Fixed Towers (IFT) on the Tohono O'odham Nation in the U.S. Border Patrol's (USBP) Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona* (hereinafter "Final BA").

OTIA is proposing to construct, operate, and maintain 15 new IFTs; construct one command and control (C2) modular facility; leverage two existing IFTs and one existing C2 facility; construct and maintain 15 access roads (less than 1 mile); and improve, repair, and maintain approximately 80 miles of approach roads. Two staging areas, previously established for construction of the U.S./Mexico border fence, will also be utilized for the Proposed Action.

The Proposed Action is located entirely within Pima County, Arizona. The proposed new IFT sites will be located within the main reservation of the Tohono O'odham Nation. The new C2 modular facility will be located at the San Miguel Law Enforcement Center, which is also on the main reservation of the Tohono O'odham Nation. One existing IFT and the existing C2 facility are located on Federal lands at the USBP Ajo Station. The second existing IFT is located on Bureau of Land Management lands along State Route 85.

The U.S. Fish and Wildlife Service (FWS) currently lists 17 species protected under the Endangered Species Act of 1973, as amended, as occurring in Pima County, Arizona. Of these Federally listed species, two species, the lesser long-nosed bat (*Leptonycteris curasoae*) and the jaguar (*Panthera onca*), have the potential to occur within the range of potential direct or indirect effects resulting from the Proposed Action.

The following six Federally listed species have designated critical habitat in Pima County, Arizona: Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*), Mexican spotted owl (*Strix occidentalis lucida*), Chiricahua leopard frog (*Lithobates chiricahuensis*), southwestern willow flycatcher (*Empidonax traillii extimus*), desert pupfish (*Cyprinodon macularius*), and Gila chub (*Gila intermedia*). No designated

Mr. Steve Spangle
Page 2

critical habitat occurs within the range of potential direct or indirect effects resulting from the Proposed Action.

OTIA has determined that the Proposed Action may affect, but is not likely to adversely affect, the lesser long-nosed bat and the jaguar. Supporting evidence for these determinations can be found in the enclosed Final BA. Should the project be modified, additional analysis and surveys may be required to determine the impact on Federally listed species. OTIA has incorporated FWS's recommendations, provided in the correspondence to Mary Hassell, dated July 19, 2013, into the design of the Proposed Action. OTIA respectfully requests FWS's concurrence on its determinations at this time.

Thank you for your assistance in our project planning efforts. If you have any questions, please contact me at (949) 643-6383 or charles.h.parsons@cbp.dhs.gov.

Sincerely,

A handwritten signature in blue ink that reads "Charles Parsons". The signature is fluid and cursive, with the first name "Charles" and last name "Parsons" clearly legible.

Charles Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Garry Cantley , Bureau of Indian Affairs, Western Regional Office
Charles Lewis, Bureau of Indian Affairs, Western Regional Office
Karen Howe, Tohono O'odham Nation, Department of Natural Resources

Enclosures



U.S. Customs and
Border Protection

Honorable Ned Norris, Jr., Chairman
Tohono O'odham Nation
Main Street
Building #9
Sells, AZ 85634

MAR 05 2014

RE: Final Biological Assessment for the Integrated Fixed Towers on the Tohono O'odham Nation in the Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona

Dear Chairman Norris:

The U.S. Customs and Border Protection, Office of Technology Innovation and Acquisition is pleased to forward the *Final Biological Assessment for the Proposed Integrated Fixed Towers on the Tohono O'odham Nation in the U.S. Border Patrol's Ajo and Casa Grande Stations' Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona*. Please find enclosed two (2) hard copies and two (2) electronic copies of the report.

Please do not hesitate to call me at (949) 643-6383 or contact me at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles Parsons".

Charles Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Charles McGregor, USACE
Karen Howe, Department of Natural Resources

Enclosures



U.S. Customs and
Border Protection

MAR 05 2014

Mr. Charles Lewis
Bureau of Indian Affairs – EQS Branch
2600 N. Central Avenue, 4th Floor Mailroom
Phoenix, AZ 85004

RE: Final Biological Assessment for the Integrated Fixed Towers on the Tohono
O’odham Nation in the Ajo and Casa Grande Stations’ Areas of Responsibility,
U.S. Border Patrol Tucson Sector, Arizona

Dear Mr. Lewis:

The U.S. Customs and Border Protection, Office of Technology Innovation and Acquisition is pleased to forward the *Final Biological Assessment for the Proposed Integrated Fixed Towers on the Tohono O’odham Nation in the U.S. Border Patrol’s Ajo and Casa Grande Stations’ Areas of Responsibility, U.S. Border Patrol Tucson Sector, Arizona*. Please find enclosed one (1) hard copy and one (1) electronic copy of the report.

Please do not hesitate to call me at (949) 643-6383 or contact me at charles.h.parsons@cbp.dhs.gov if you have any questions, or require additional hard copies of the report.

Sincerely,

A handwritten signature in blue ink that reads "Charles Parsons".

Charles Parsons
Acting Environmental Branch Chief
Environment & Real Estate Branch
U.S. Customs and Border Protection
Office of Technology Innovation and Acquisition

cc: Charles McGregor, USACE

Enclosures

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APPENDIX B
CONCEPTUAL FIELD LAYDOWNS



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Tower Number	Common Name	Latitude	Longitude	Type
December 2009				
AJO-133	FR 1 North	32.20650	-112.57124	Preferred
AJO-172	Chukut Kuk C1	32.22805	-112.71815	Preferred
CAG-018	Nelson Well	31.7141	-112.15772	Alternate
CAG-020	San Rafael	31.69764	-112.05615	Preferred
CAG-021	Alvarez West	31.76338	-112.0023	Preferred
CAG-024	P-28-1	31.58339	-111.76992	Preferred
CAG-026	P-28-2	31.54353	-111.70817	Preferred
CAG-097	Singing Saquaro	31.7489	-112.113	Preferred
CAG-134	FR 42	32.54693	-112.0079	Preferred
CAG-220	LOS Relay	31.57316	-111.72539	Alternate
CAG-259	Vamori	31.69887	-111.95854	Rejected
CAG-260	San Miguel	31.61499	-111.76323	Alternate
CAG-261	Itak	31.66144	-111.99009	Alternate
CAG-340	Itak	31.68316	-111.98885	Preferred
CAG-341	Itak South	31.68257	-111.98986	Alternate
CAG-342	Chukut Kuk C7 Alternate	31.74456	-112.09436	Alternate
CAG-343	Onion Stand	31.74934	-112.15552	Preferred
CAG-344		31.63869	-111.77279	Preferred
January 2010				
AJO-095	Papago Farms Relay	31.7645	-112.304	Preferred
AJO-14	Crossover 2	32.04772	-112.38922	Preferred
AJO-15	FR 21	31.82868	-112.32185	Preferred
AJO-16	FR 24 Beacon	31.93987	-112.30745	Preferred
AJO-16 ALT				Alternate
AJO-17	Kupk	31.90068	-112.1841	Preferred
AJO-172	Gunsight	32.22762	-112.71793	Preferred
AJO-174		32.19612	-112.35402	Preferred
AJO-332				Preferred
AJO-333	FR 1 North			Preferred
AJO-345	Rte 86 near IR21	32.18233	-112.33414	Preferred
AJO-346				Preferred
AJO-347				Preferred
CAG-023	Animas South	31.7126	-111.81299	Preferred
CAG-096	Quijotoa	32.1331	-112.16	Preferred
CAG-169	Burro Mountain	31.8696	-111.873	Preferred
CAG-313				
CAG-349	CAG Vehicle Maintenance Facility	32.81949	-111.66908	Preferred
CAG-357	Sif Oidak District off AZ-42	32.69729	-111.94963	Preferred
February 2010				
AJO-9	Gu Vo	32.05169	-112.57714	Preferred
AJO-10	Milepost 7 Road	31.90036	-112.55491	Preferred
AJO-10 ALT 1				Alternate
AJO-10 ALT 2				Alternate
AJO-11	Crossover 1	32.07105	-112.50611	Preferred
AJO-12	Tank	31.86175	-112.47513	Preferred
AJO-93	Siovi	31.95127	-112.59265	Preferred
AJO-132	FR 1 South	32.14418	-112.57963	Preferred
CAG-262	Fresnal Canyon	31.79057	-111.7101	Preferred
CAG-352				
CAG-353				
CAG-351		31.69747	-111.77440	Preferred
CAG-358				
CAG-359		31.80204	-111.71416	Preferred
CAG-356		32.58933	-111.99878	Preferred
CAG-360	Santa Rosa	32.35254	-112.05771	Preferred

Tower Number	Common Name	Latitude	Longitude	Type
June 2011				
AJO-0090	Ajo Station	32.2737	-112.74	Alternate
AJO-0093	Siovi	31.95124	-112.59261	Preferred
AJO-0132	FR-1 South	32.14419	-112.57962	Preferred
AJO-0133	FR-1 North	32.20815	-112.57213	Preferred
AJO-0172	Gunsight	32.22762	-112.71793	Preferred
AJO-0216	Block 1 sensor site	32.20085	-112.76562	Alternate
AJO-0305	Ajo Station	32.27537	-112.73977	Preferred
AJO-0345	TRTE 86 nr IR21	32.18233	-112.33414	Preferred
AJO-0355	nr Gunsight	32.22528	-112.71818	Alternate
AJO-0398	Casino Sign	32.22757	-112.71837	Preferred
CAG-0096	Quijotoa	32.13328	-112.15897	Preferred
CAG-0195	Sacaton Peak	32.81949	-111.66908	Preferred
CAG-0349	CAG Veh Mntc Fac	33.00243	-111.67427	Preferred
CAG-0357	Sif Oidak District off AZ-42	32.69729	-111.94963	Preferred
CAG-0360	Santa Rosa	32.35254	-112.05771	Preferred
July 2012				
CAG-Tower-1	Trading Post and 2 Mile Drag	31.572975	-111.685136	Preferred
CAG-Tower-7	San Miguel LEC/Old P-28 site, at C-2 facility	31.5835	-111.77	Preferred
CAG-Tower-2	Ice Cream Truck Road and Wrap Around Road	31.618347	-111.839197	Preferred
CAG-Tower-3	Wamul, north of Wraparound	31.620689	-111.904731	Preferred
CAG-Tower-3	Dead Cow site	31.657399	-111.911844	Preferred
CAG-Tower-4	Vamori and Itak Rd	31.650981	-111.990342	Preferred
CAG-Tower-5	Tecolote to Torros Road	31.672425	-112.049558	Preferred
CAG-Tower-6	Serapo Road to Onion Stand	31.726358	-112.128244	Preferred
AJO-1ALT3	Secret Hill	31.767216	-112.257308	Alternate
AJO-2ALT3	San Simon Thicket	31.77362	-112.42471	Alternate
AJO-3ALT3	Menegers	31.80844	-112.54179	Alternate
AJO-4ALT3	7/13 South	31.92481	-112.57264	Alternate
AJO-5ALT3	7/13 North	31.97242	-112.58305	Alternate
AJO-6ALT3	MM18	32.05319	-112.57849	Alternate
AJO-7ALT3	Kuacatch	32.134284	-112.64021	Alternate
AJO-8ALT3	Gunsight	32.15936	-112.693212	Alternate
AJO-Tower #1	Secret Hill	31.767044	-112.257378	Preferred
AJO-Tower #2	San Simon Thicket	31.776347	-112.400569	Preferred
AJO-Tower #3	MM3	31.849278	-112.558572	Preferred
AJO-Tower #4	Menagers	31.808964	-112.541986	Preferred
AJO-Tower #5	MM7	31.923808	-112.571256	Preferred
AJO-Tower #6	GuVo Valley	32.036861	-112.56725	Preferred
AJO-Tower #7	Old GuVo	32.084819	-112.641389	Preferred
AJO-Tower #8	Gunsight	32.2083	-112.6852	Preferred
TCA-AJO-0305	Ajo Station Communication	32.27537	-112.73977	Existing
TCA-AJO-0216	Ajo-0216	32.20085	-112.76562	Existing

APPENDIX C
USBP's AJO AND CASA GRANDE STATIONS' AORs
IFT PROJECT SITES

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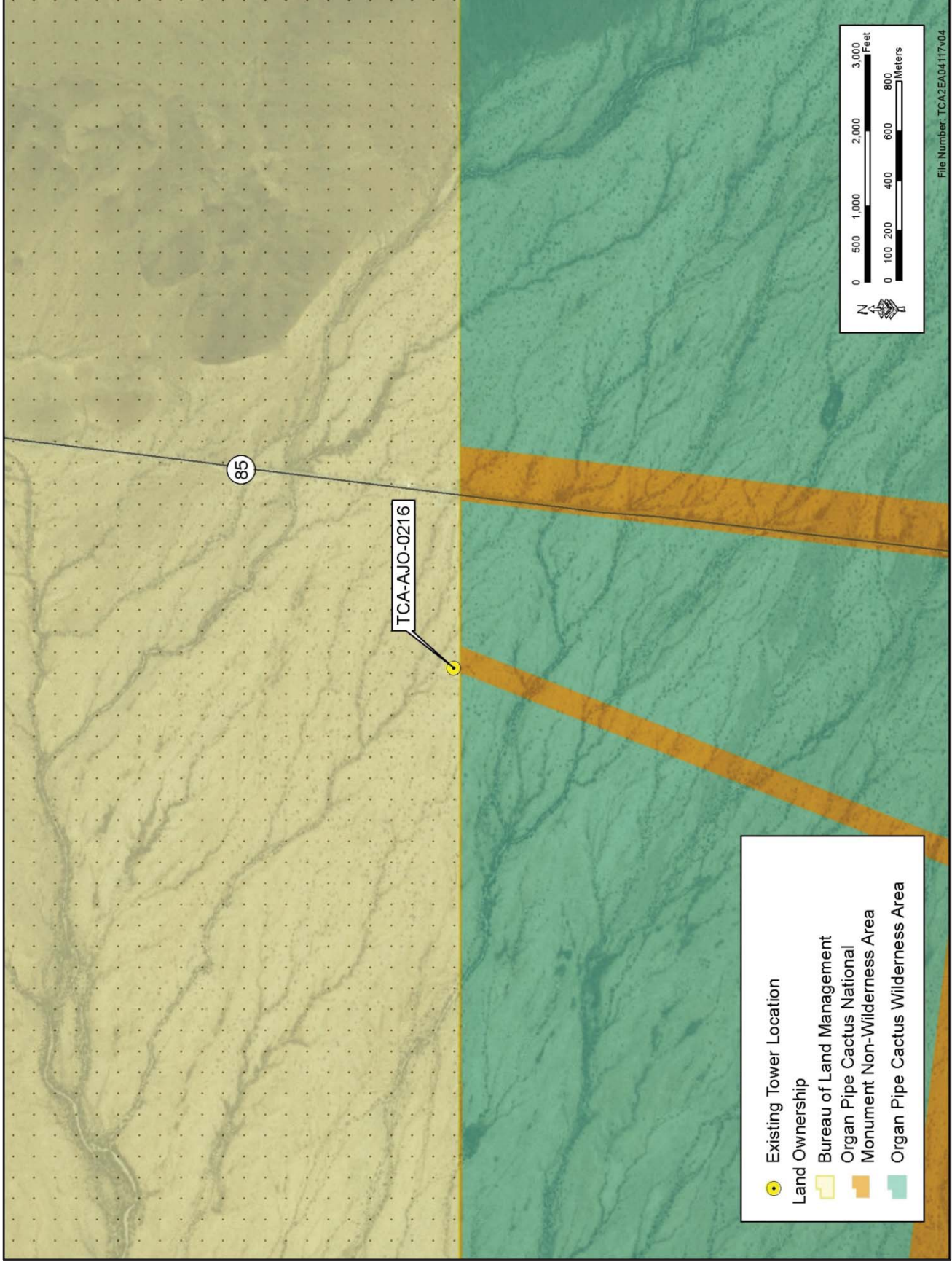


Figure 1. TCA-AJO-0216 Tower Location and Survey Area



Figure 2. TCA-AJO-0305 Tower Location and Survey Area

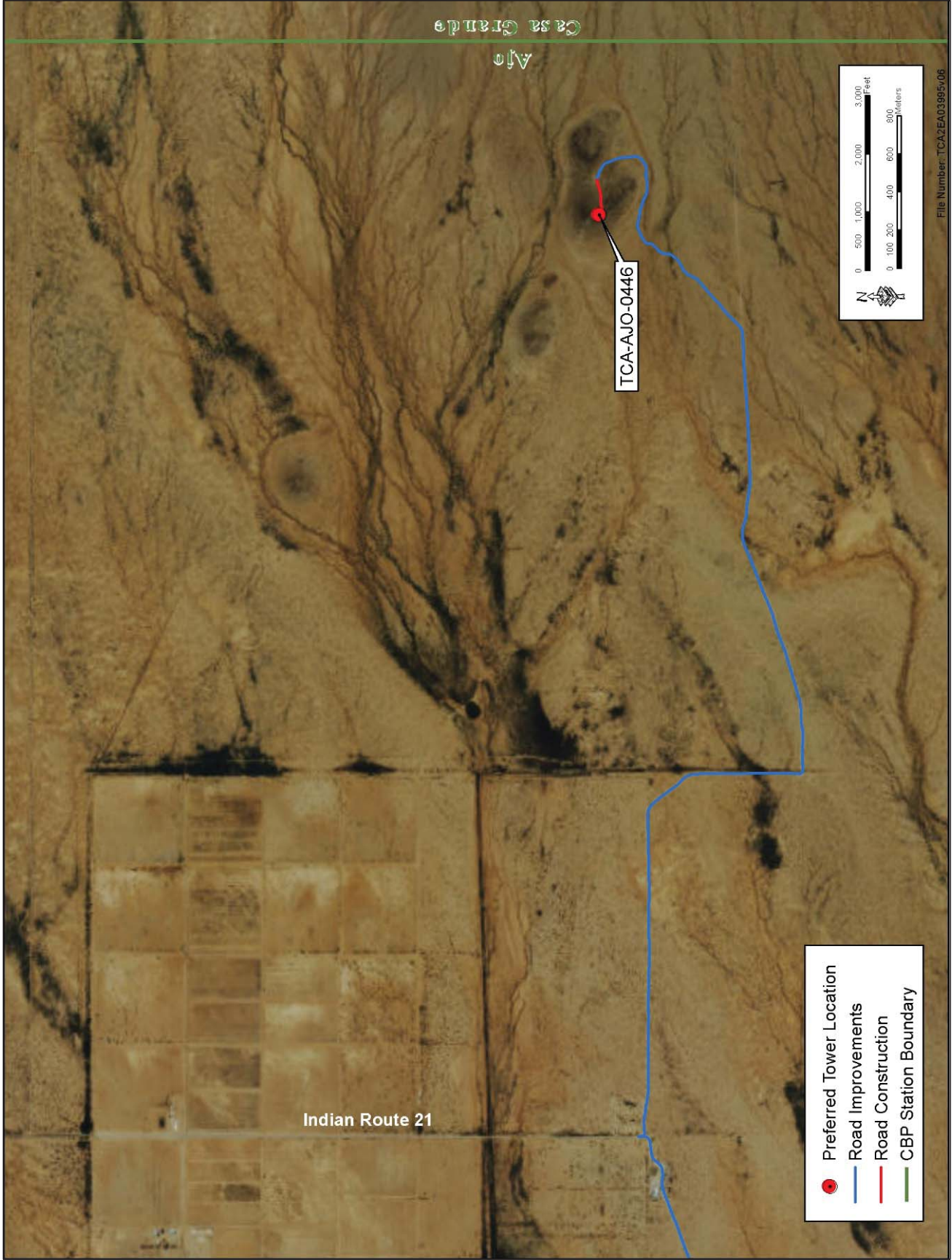


Figure 3. TCA-AJO-0446 Tower Location and Approach Roads

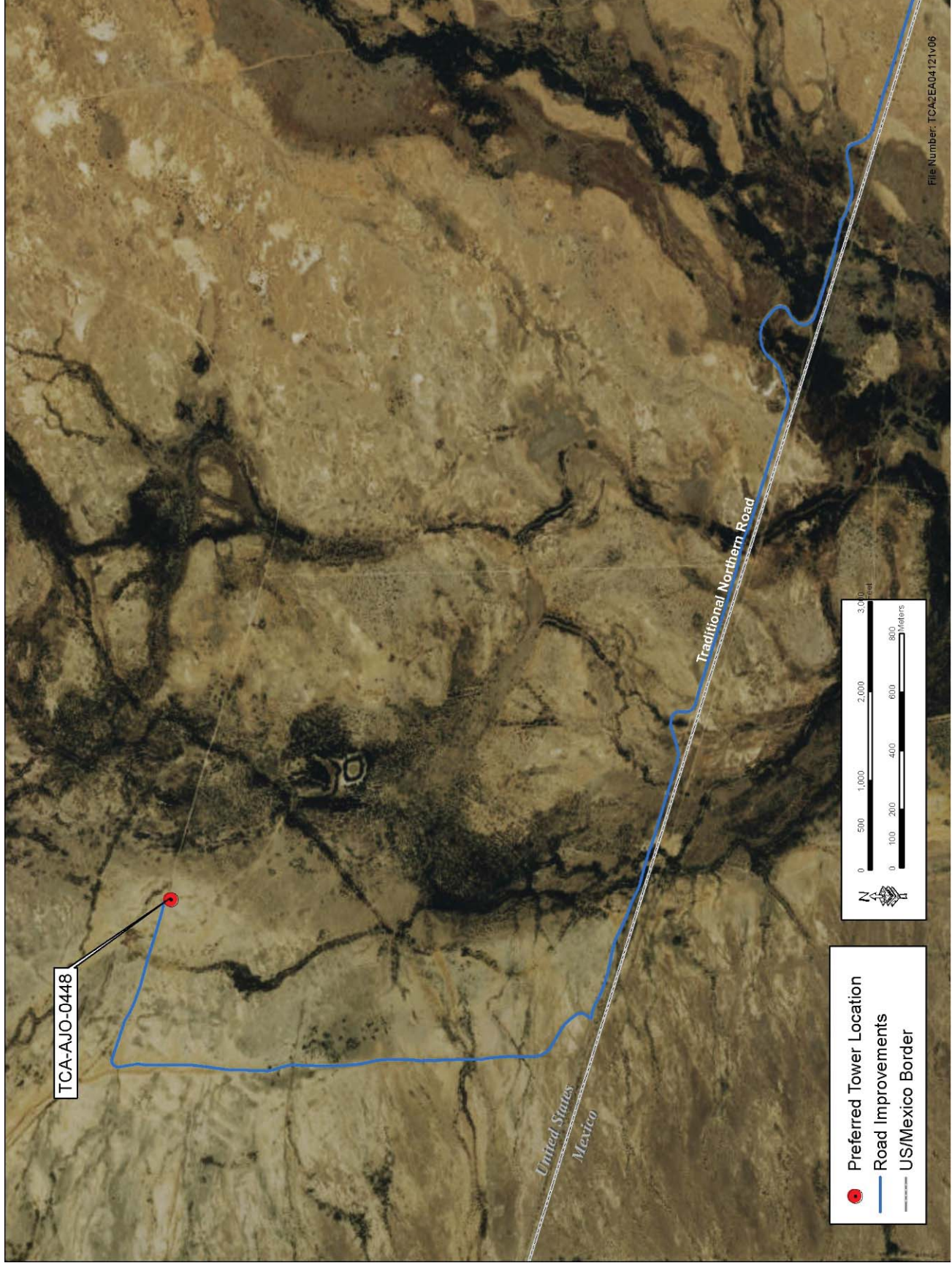
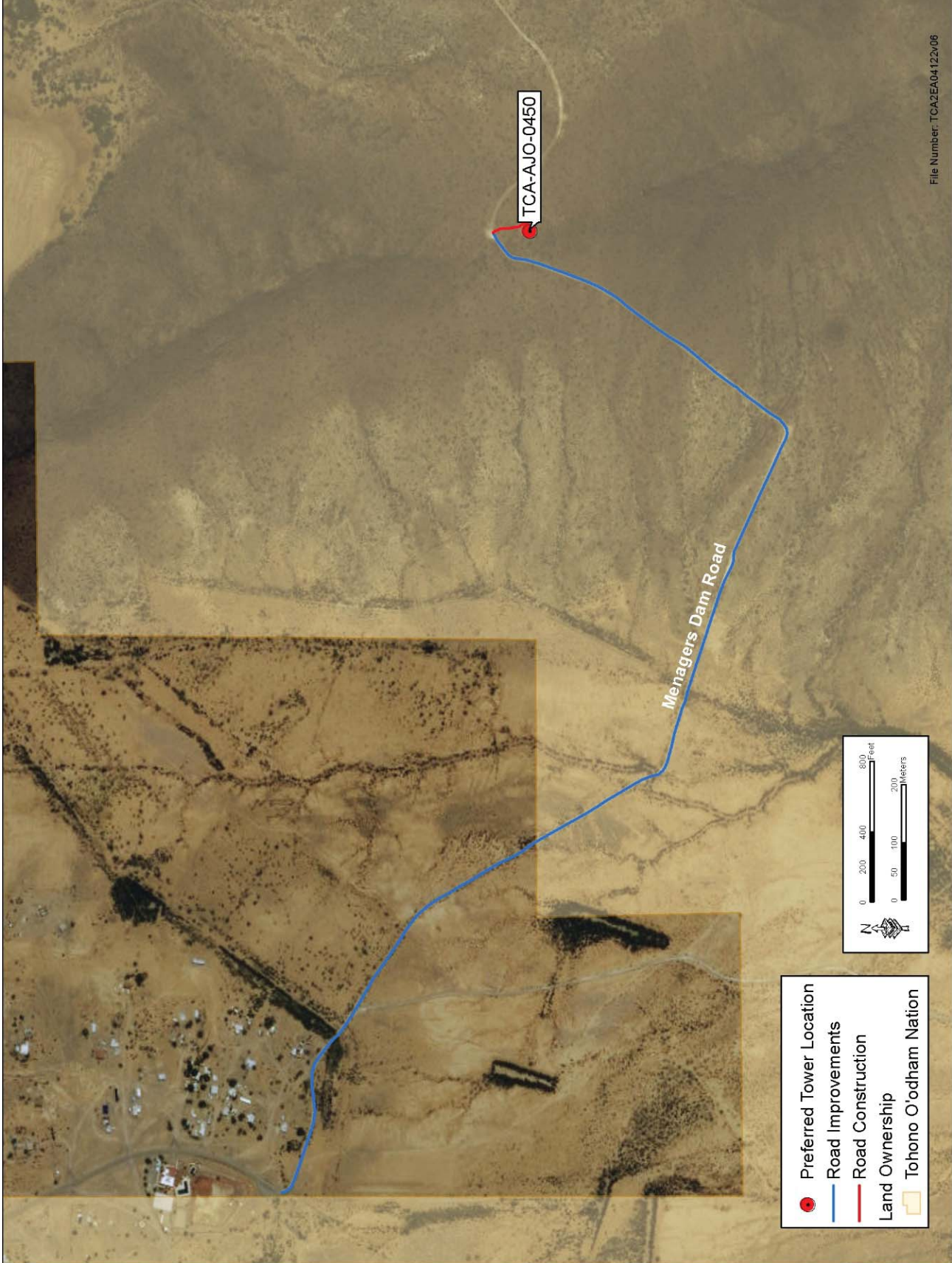


Figure 4. TCA-AJO-0448 Tower Location and Approach Roads



File Number: TCA2EA04125/08

Figure 5. TCA-AJO-0450 Tower Location and Approach Roads



Figure 6. TCA-AJO-0452 Tower Location and Approach Roads

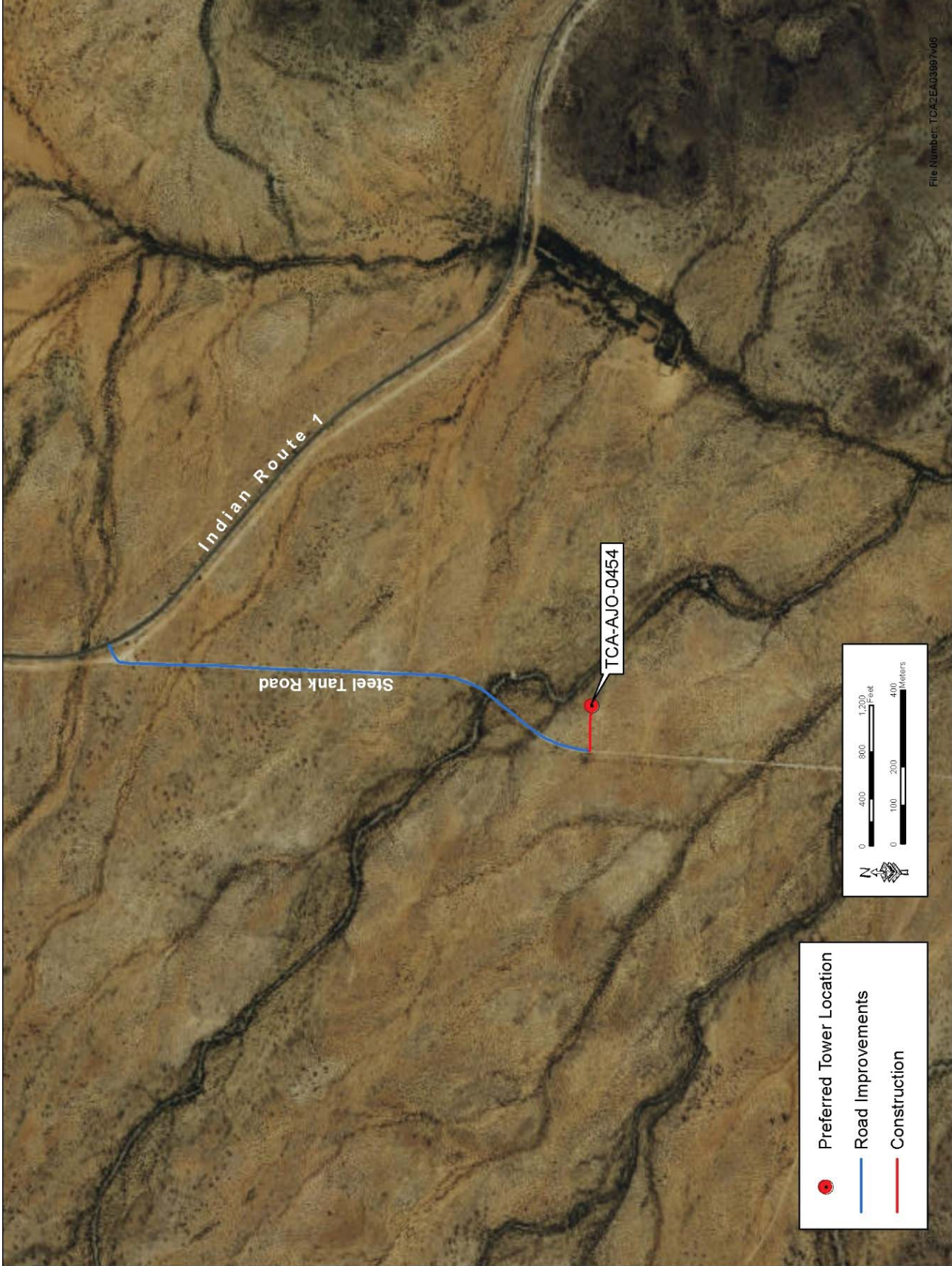


Figure 7. TCA-AJO-0454 Tower Location and Approach Roads



Figure 8. TCA-AJO-0458 Tower Location and Approach Roads

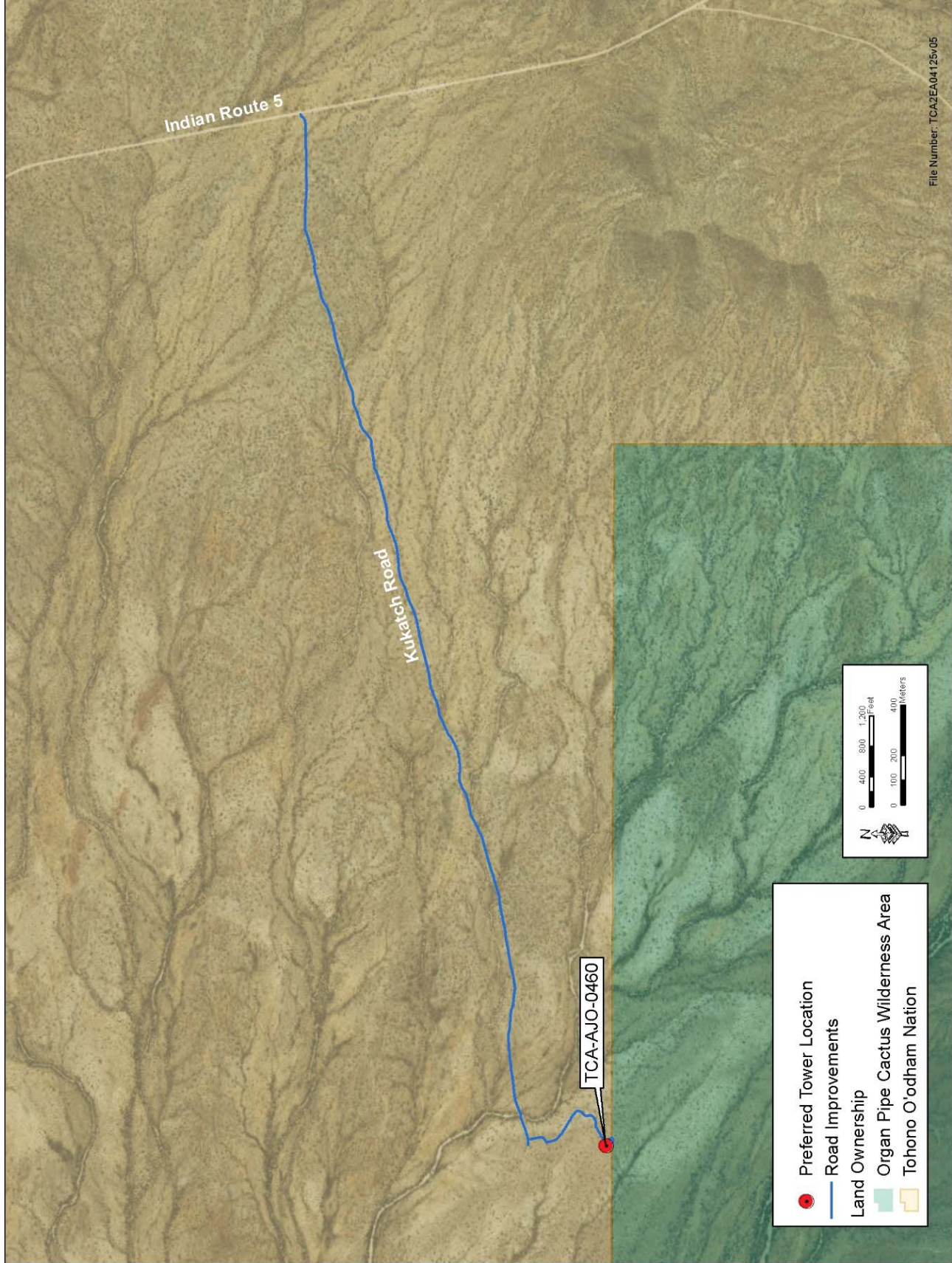


Figure 9. TCA-AJO-0460 Tower Location and Approach Roads

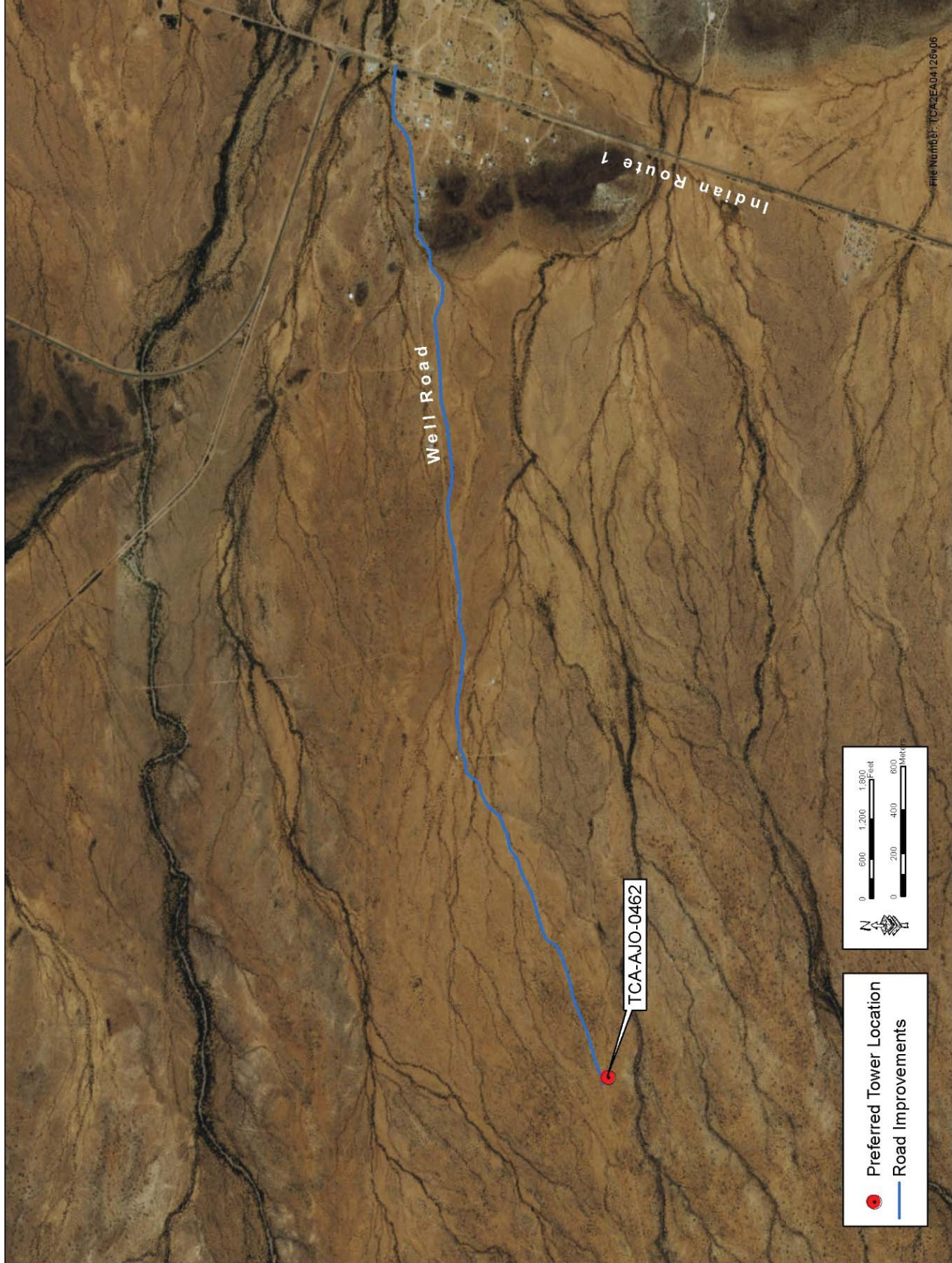


Figure 10. TCA-AJO-0462 Tower Location and Approach Roads

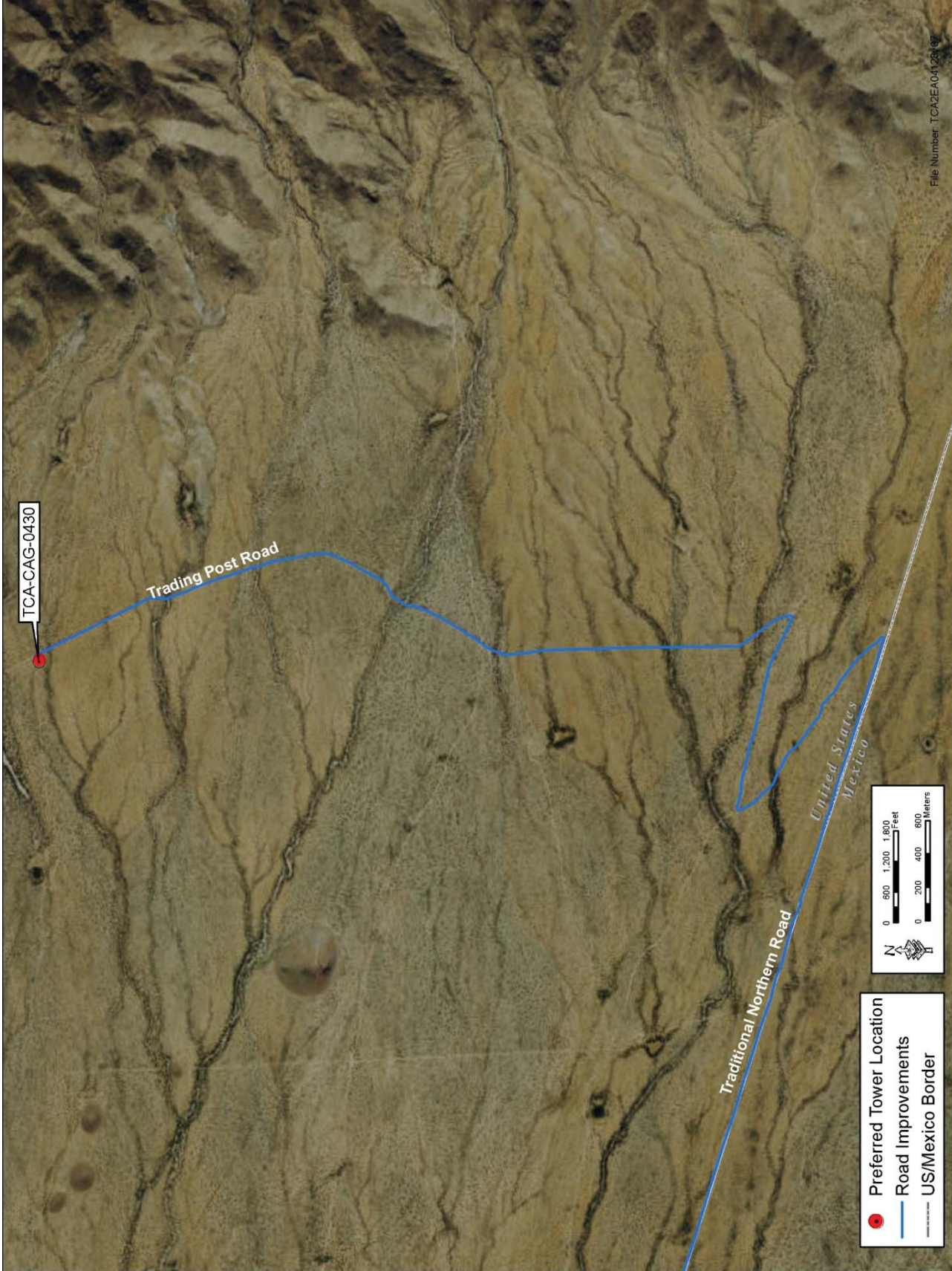


Figure 11. TCA-CAG-0430 Tower Location and Approach Roads

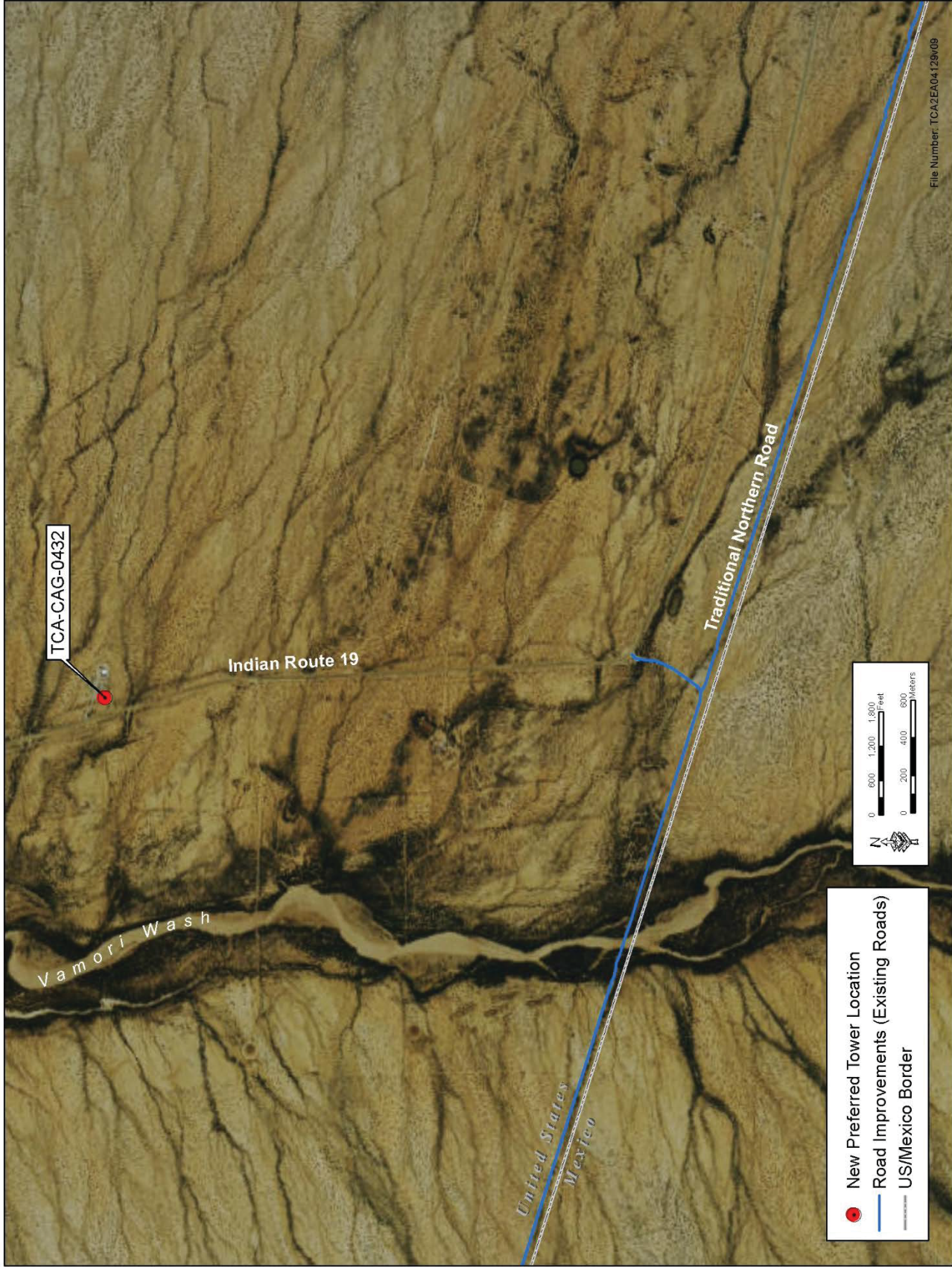


Figure 12. TCA-CAG-0432 Tower Location and Approach Roads

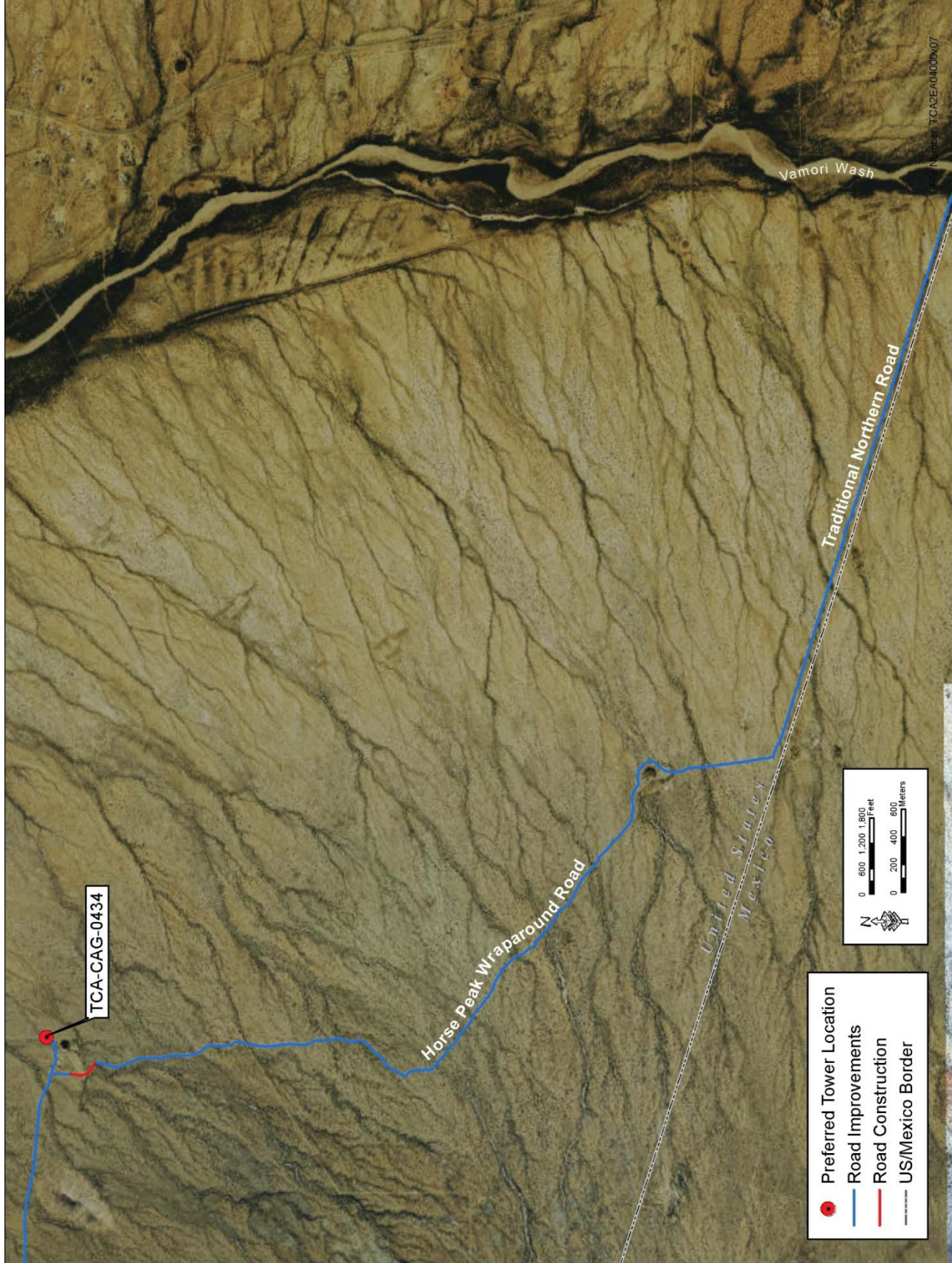


Figure 13. TCA-CAG-0434 Tower Locations and Approach Roads

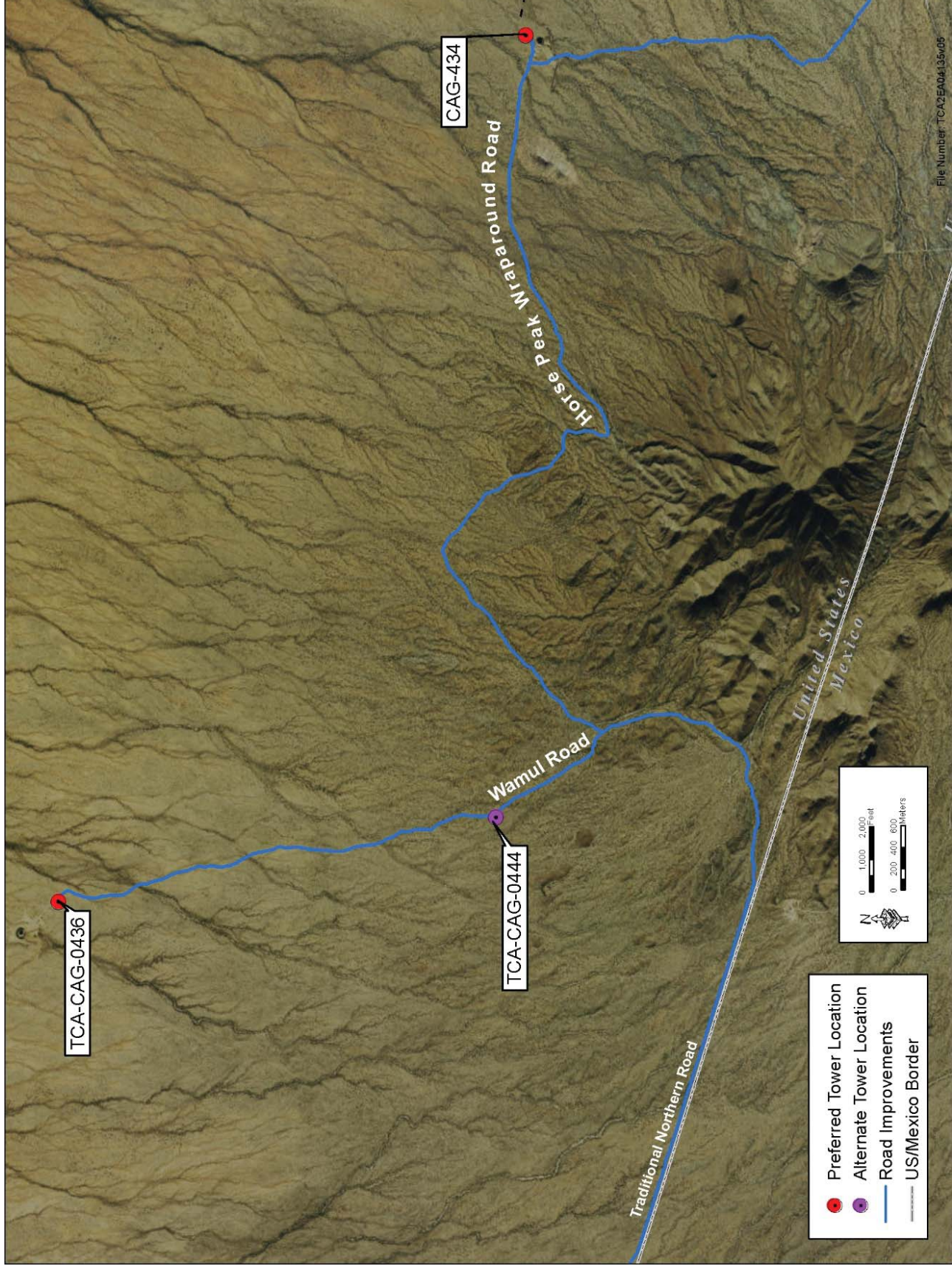


Figure 14. TCA-CAG-0436 and -0444 Tower Location and Approach Roads

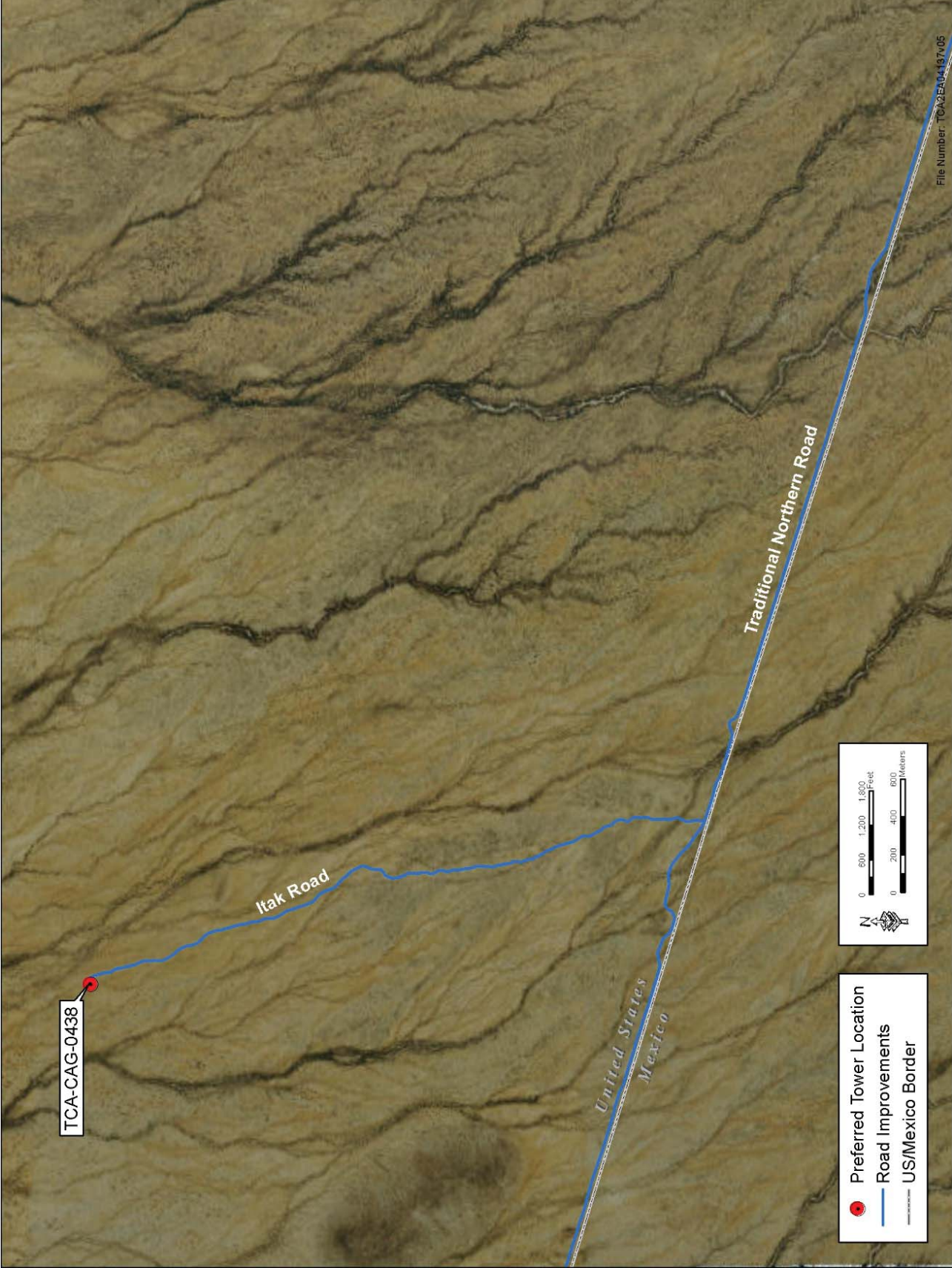


Figure 15. TCA-CAG-0438 Tower Location and Approach Roads

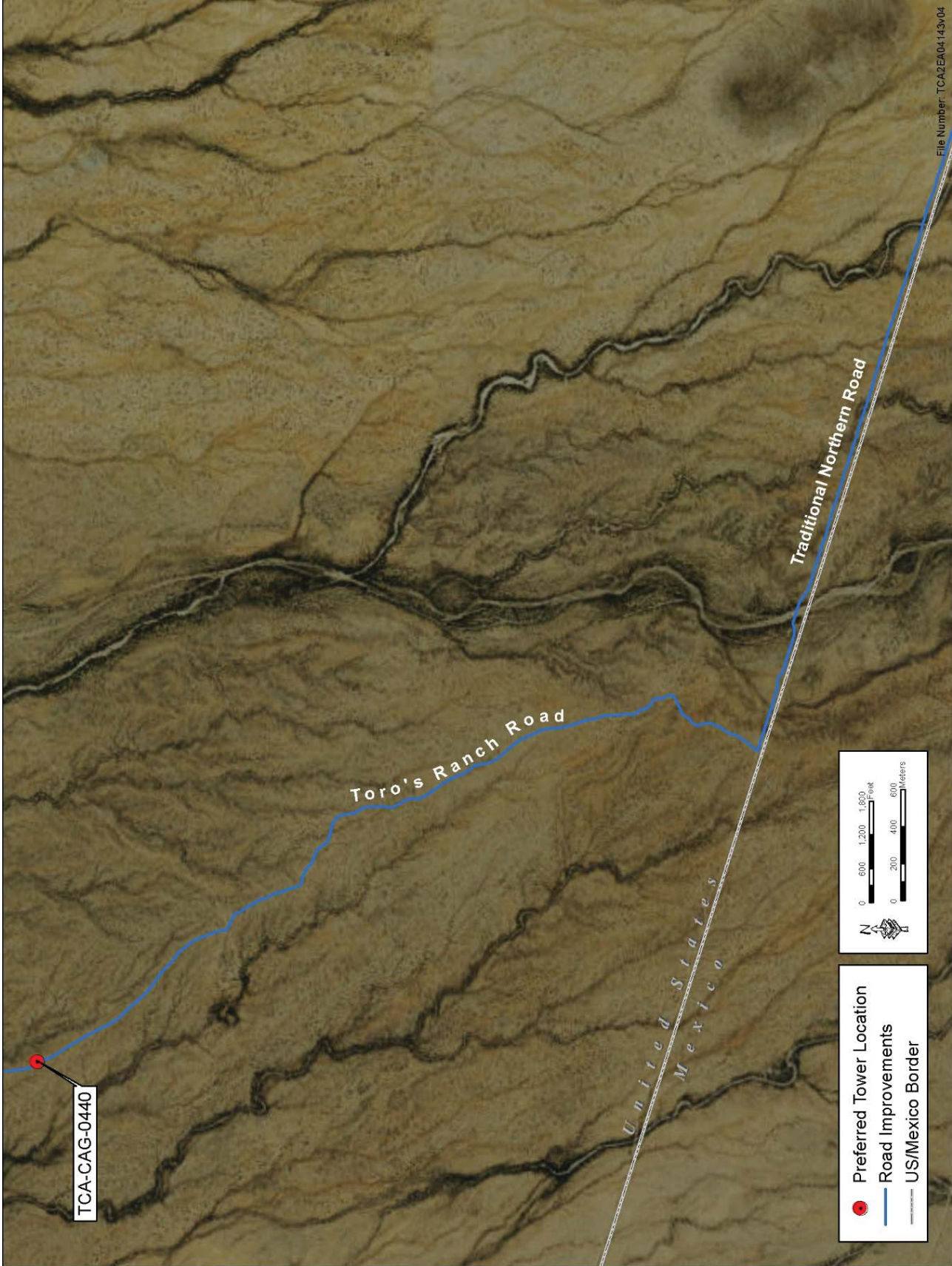


Figure 16. TCA-CAG-0440 Tower Location and Approach Roads

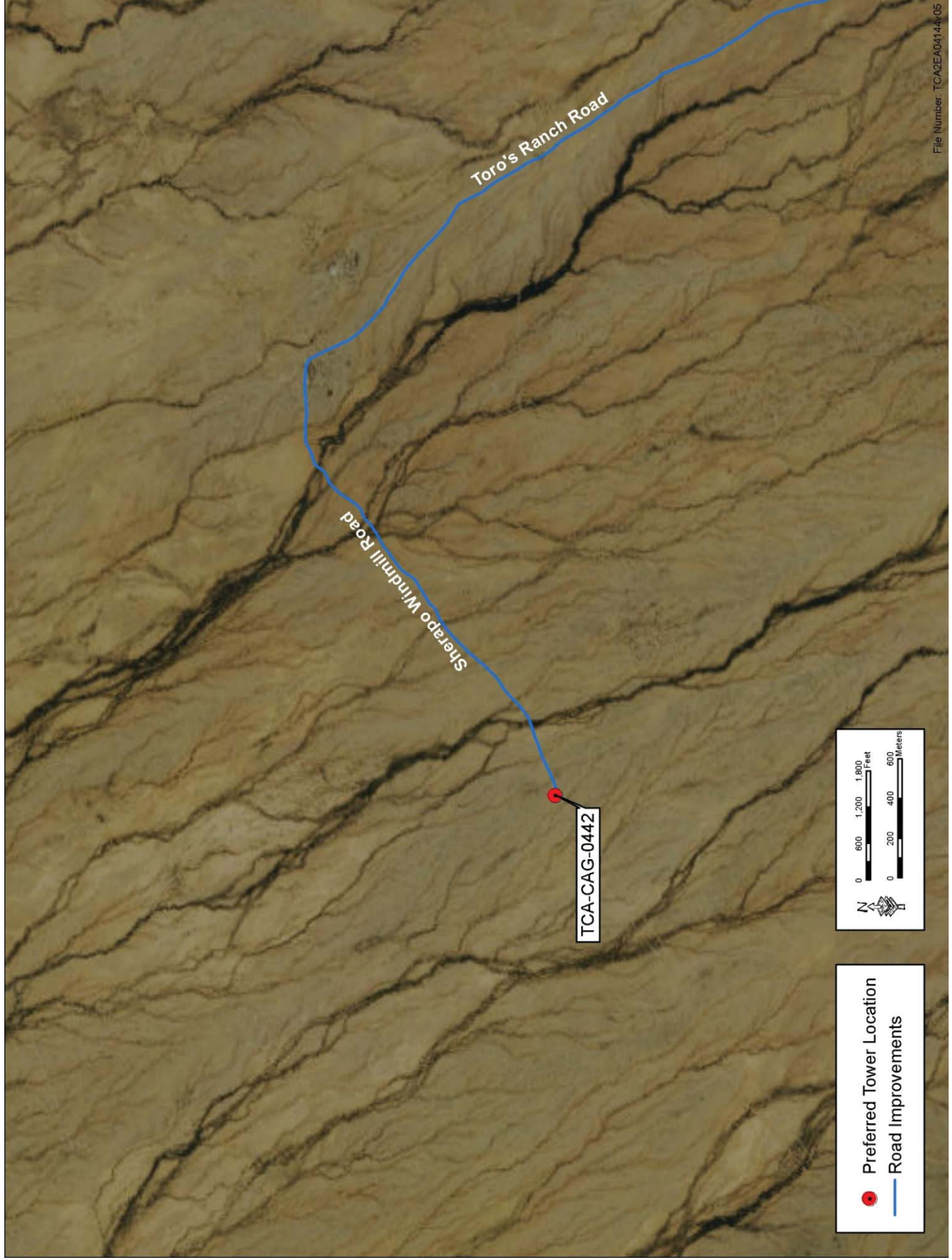


Figure 17. TCA-CAG-0442 Tower Location and Approach Roads

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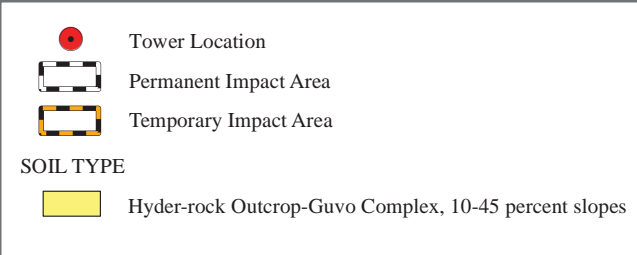
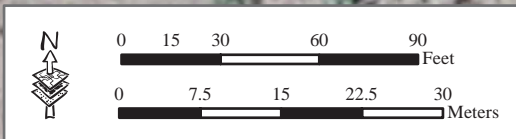
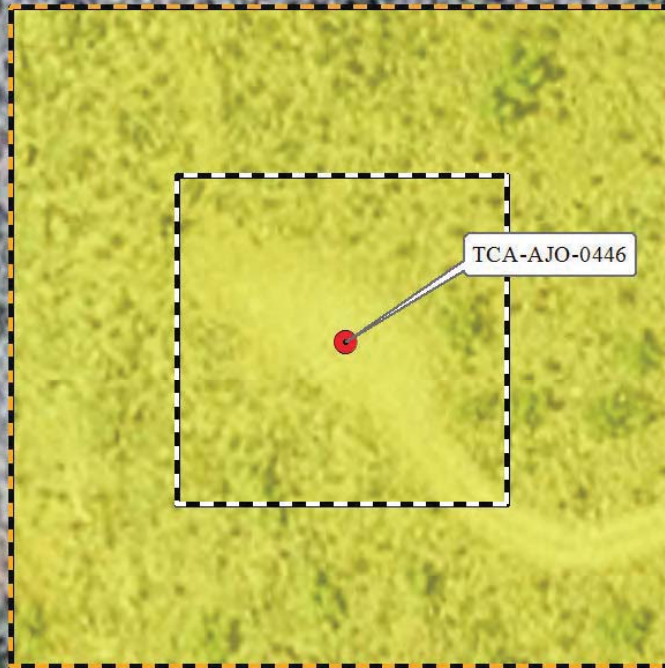
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APPENDIX D
SOIL MAPS



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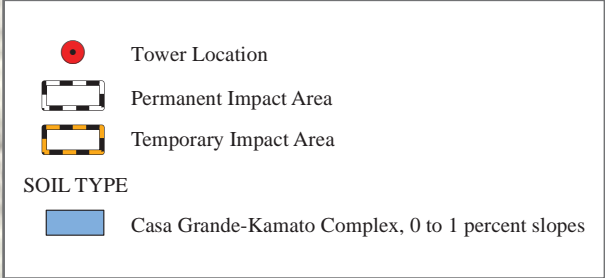
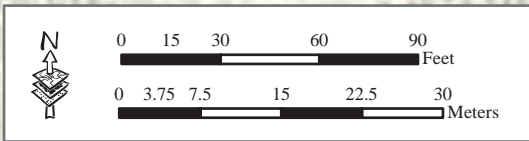
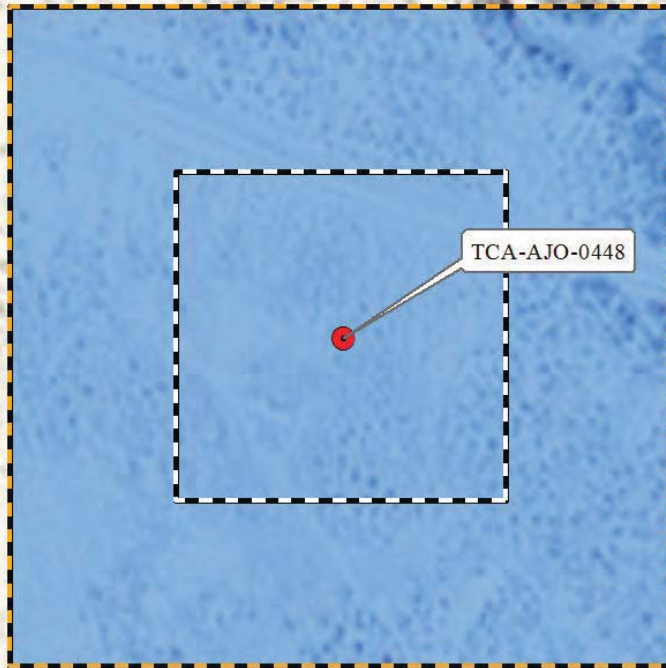
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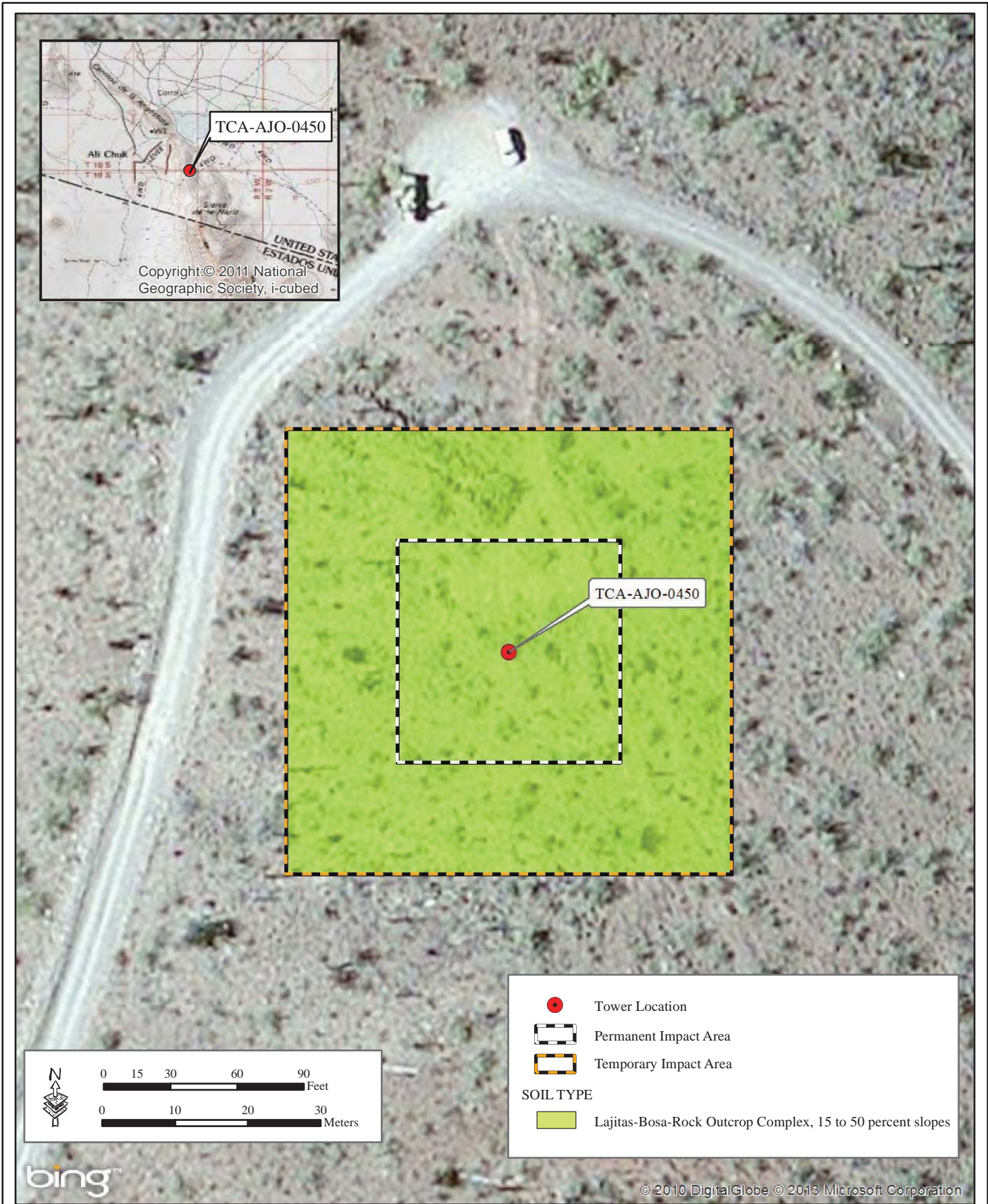
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TCA-AJO-0446 Soil Map

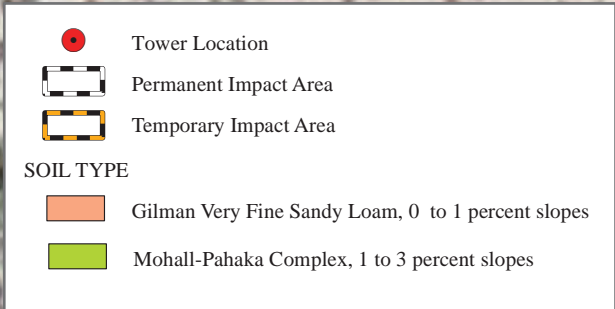
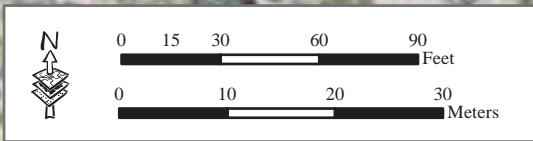
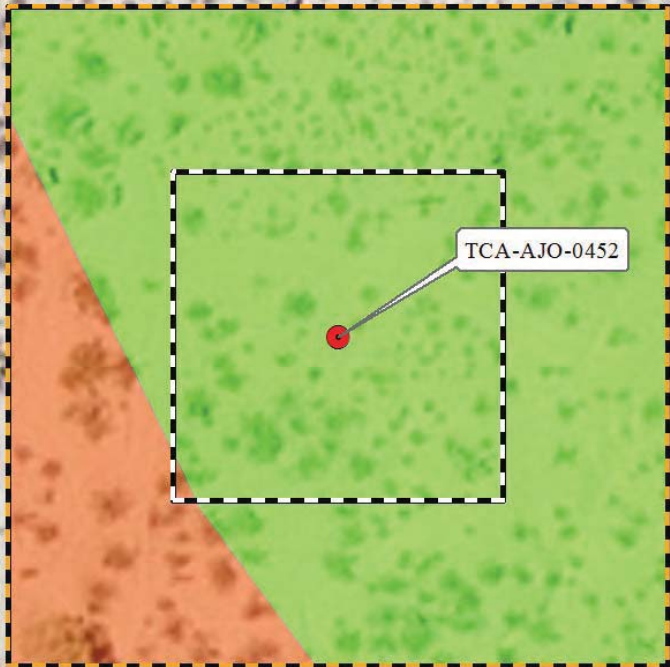


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TCA-AJO-0450 Soil Map



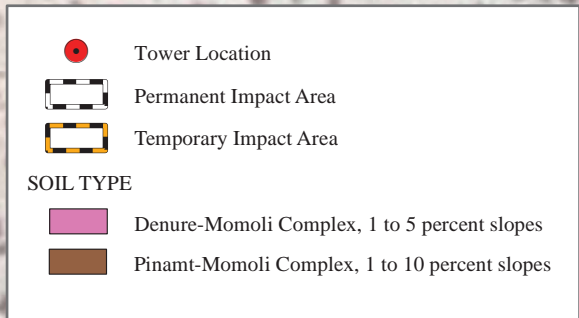
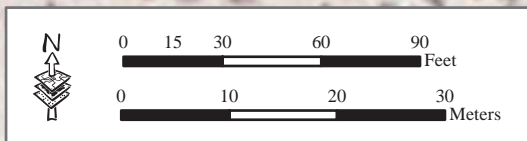
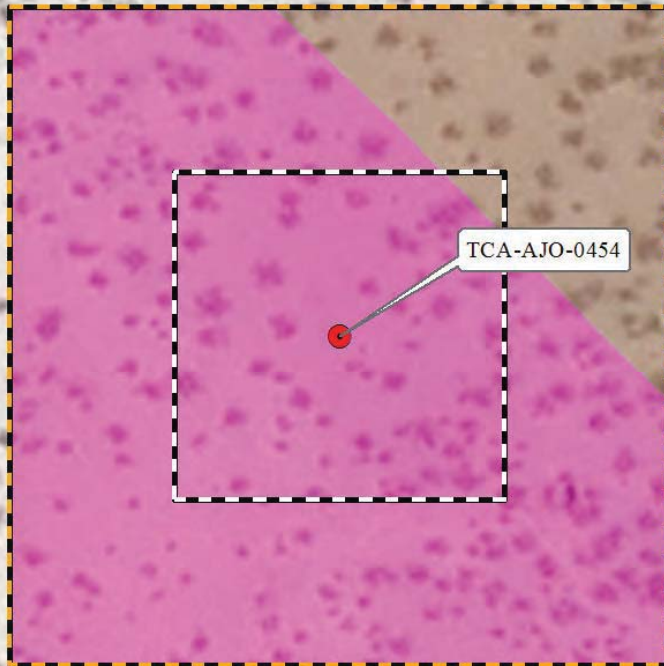
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TCA-AJO-0452 Soil Map



March 2013



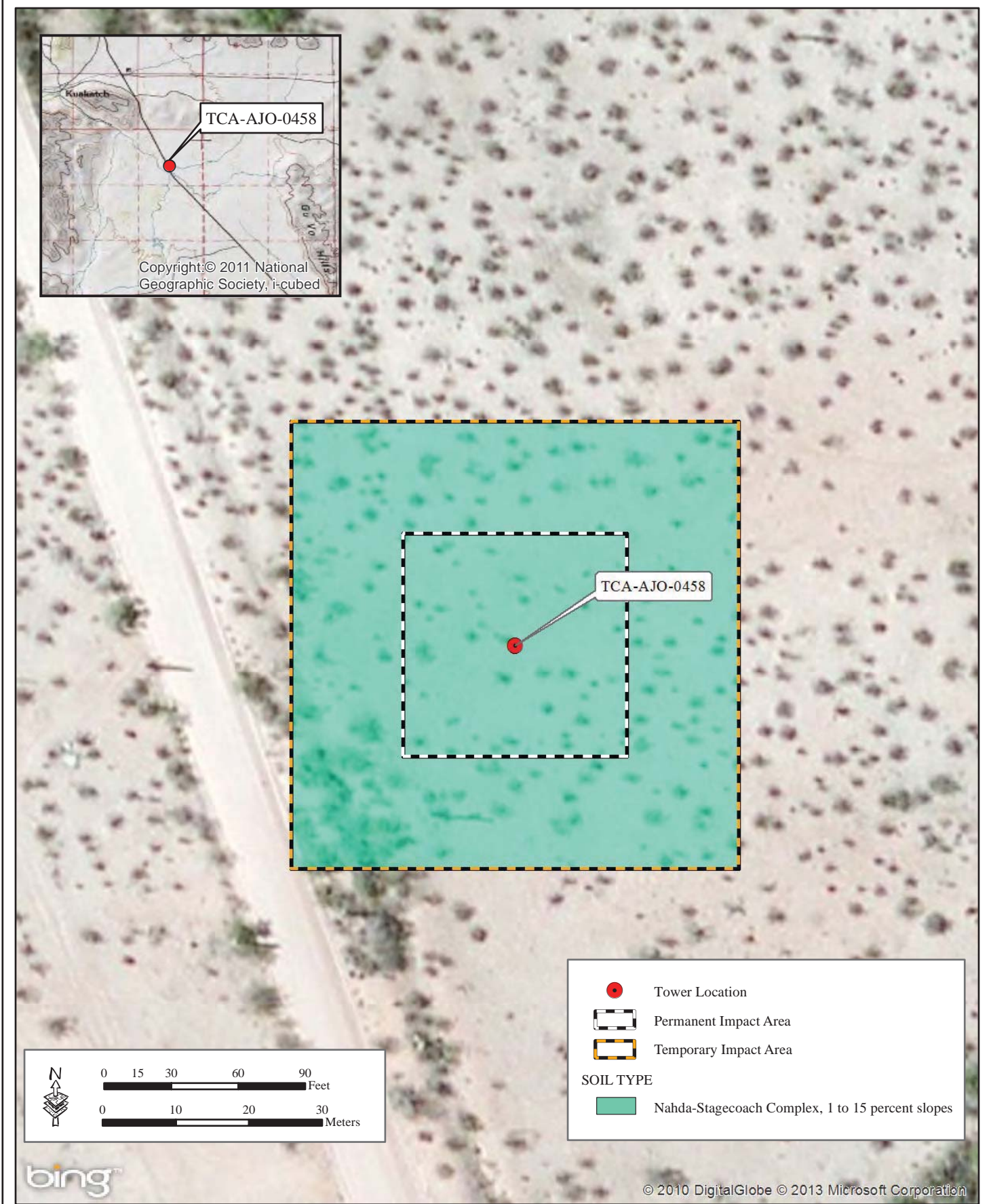
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TCA-AJO-0454 Soil Map



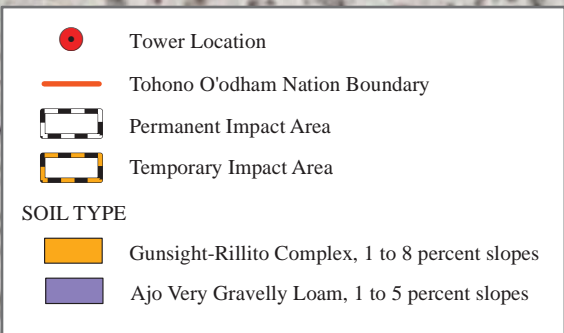
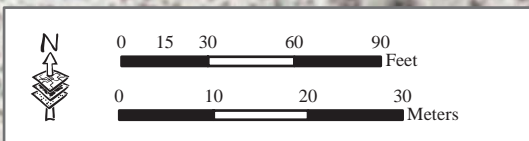
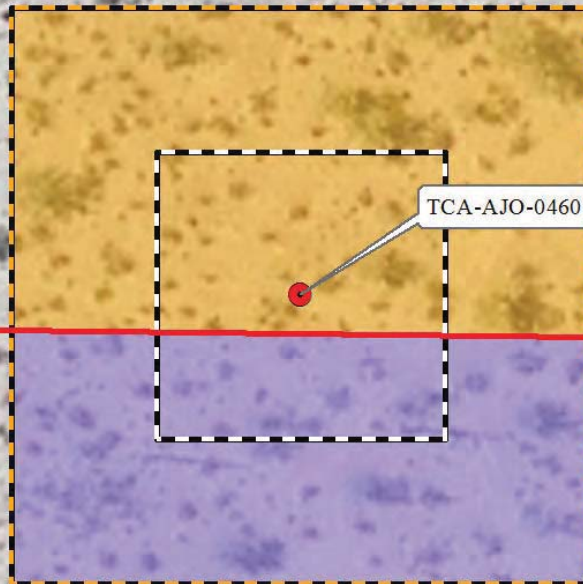
March 2013



TCA-AJO-0458 Soil Map



March 2013



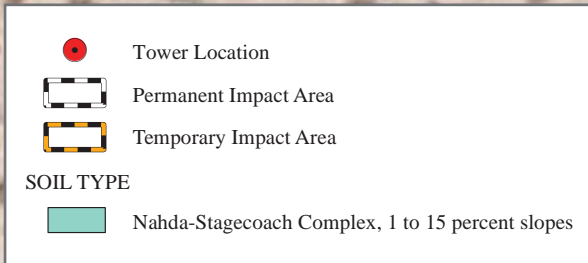
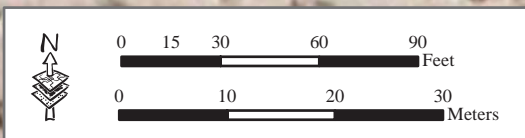
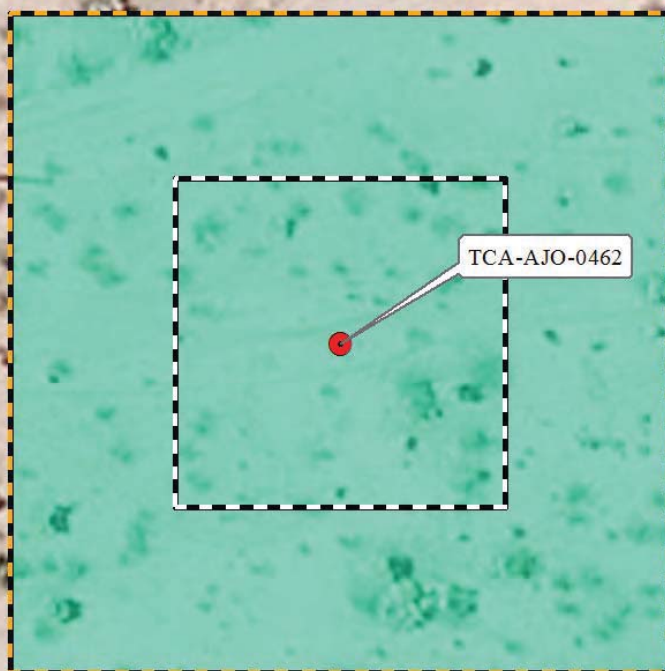
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TCA-AJO-0460 Soil Map



April 2013



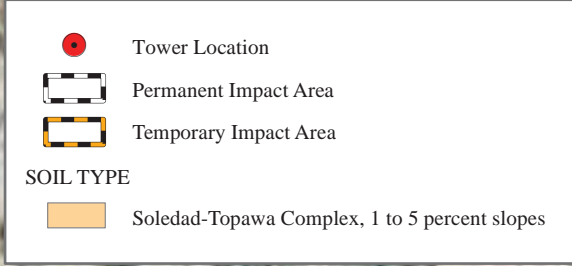
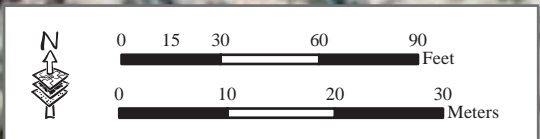
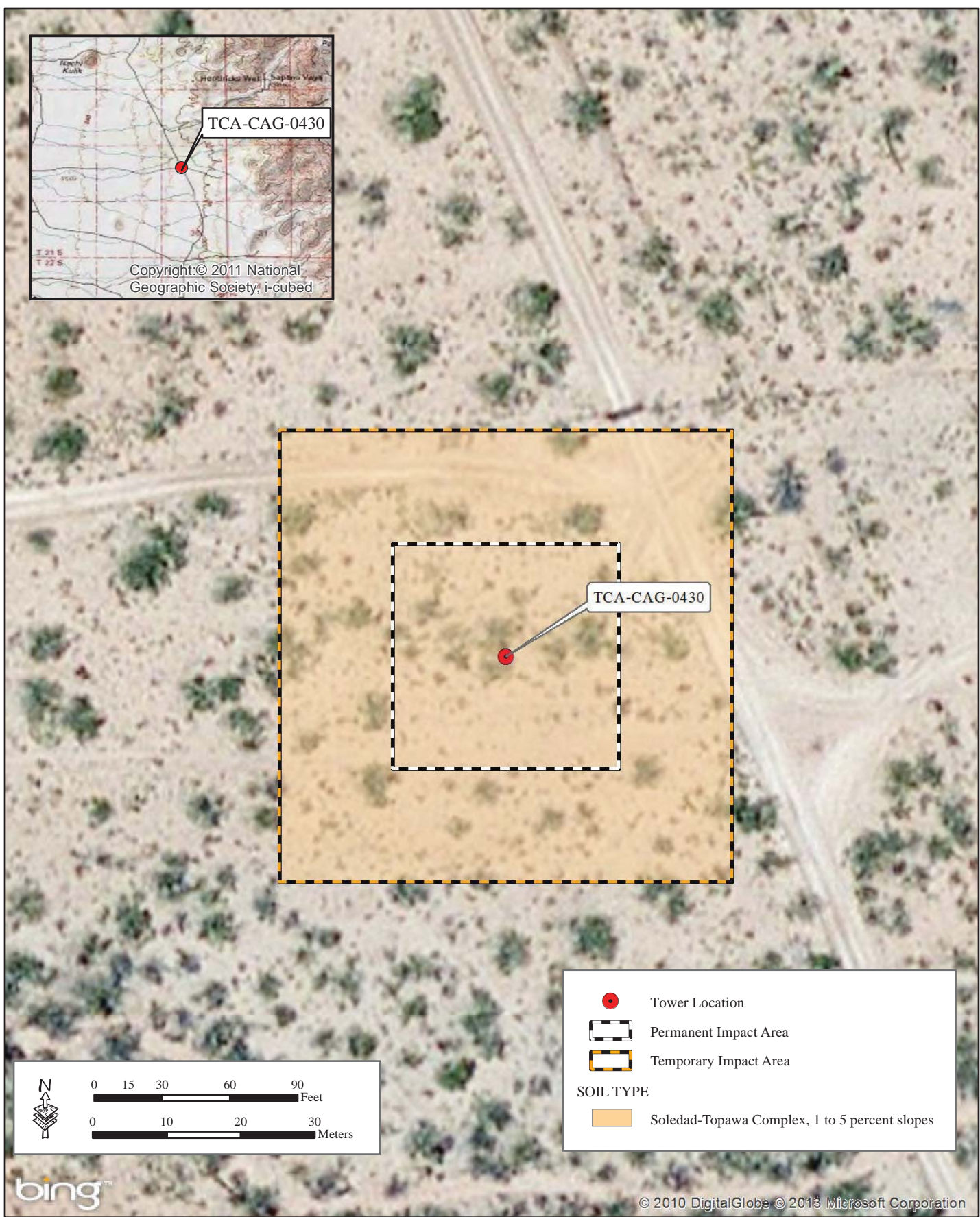
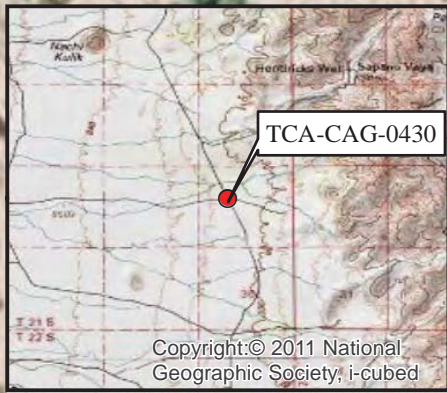
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TCA-AJO-0462 Soil Map



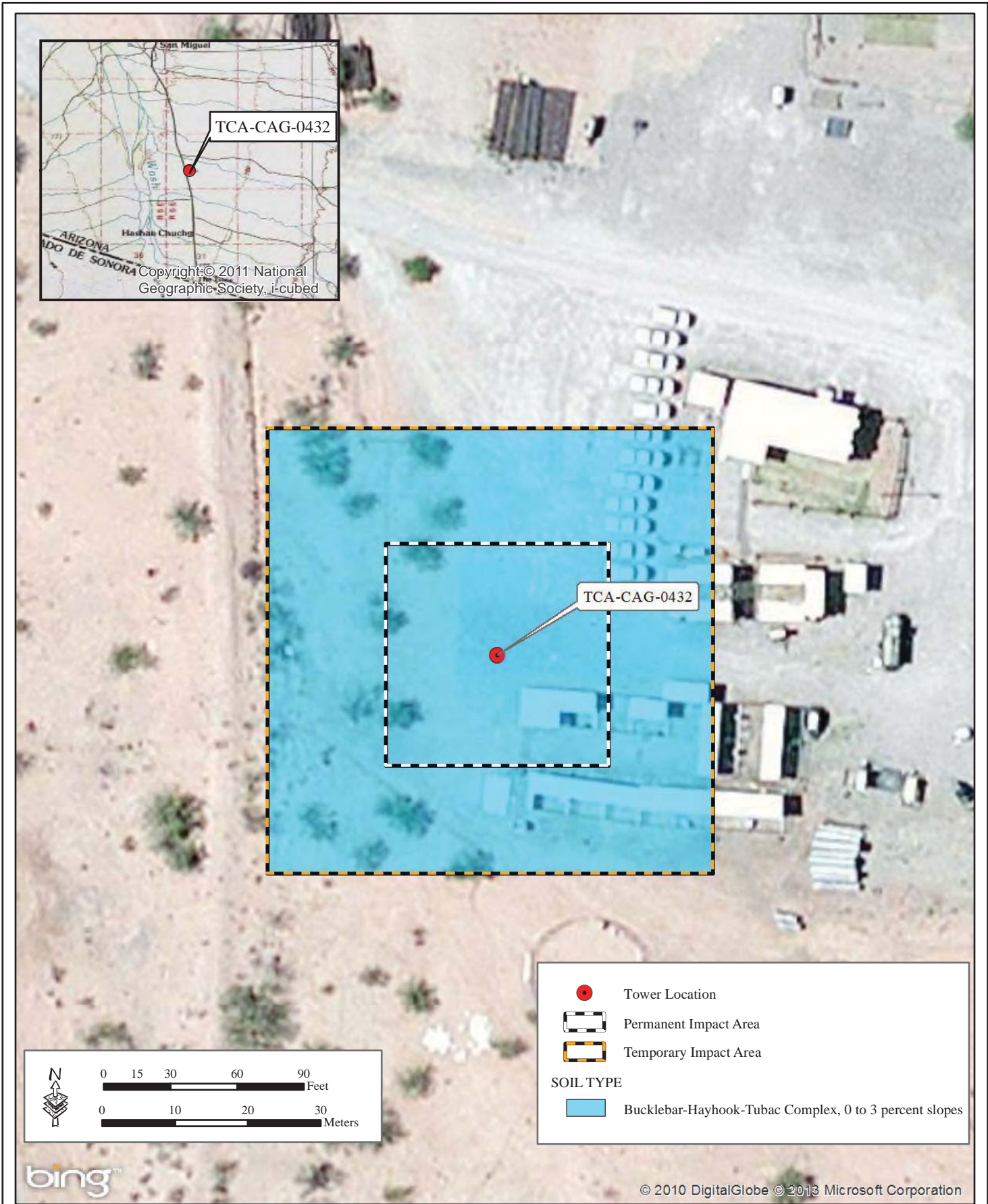
March 2013



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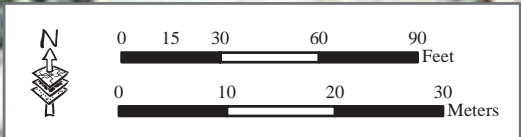
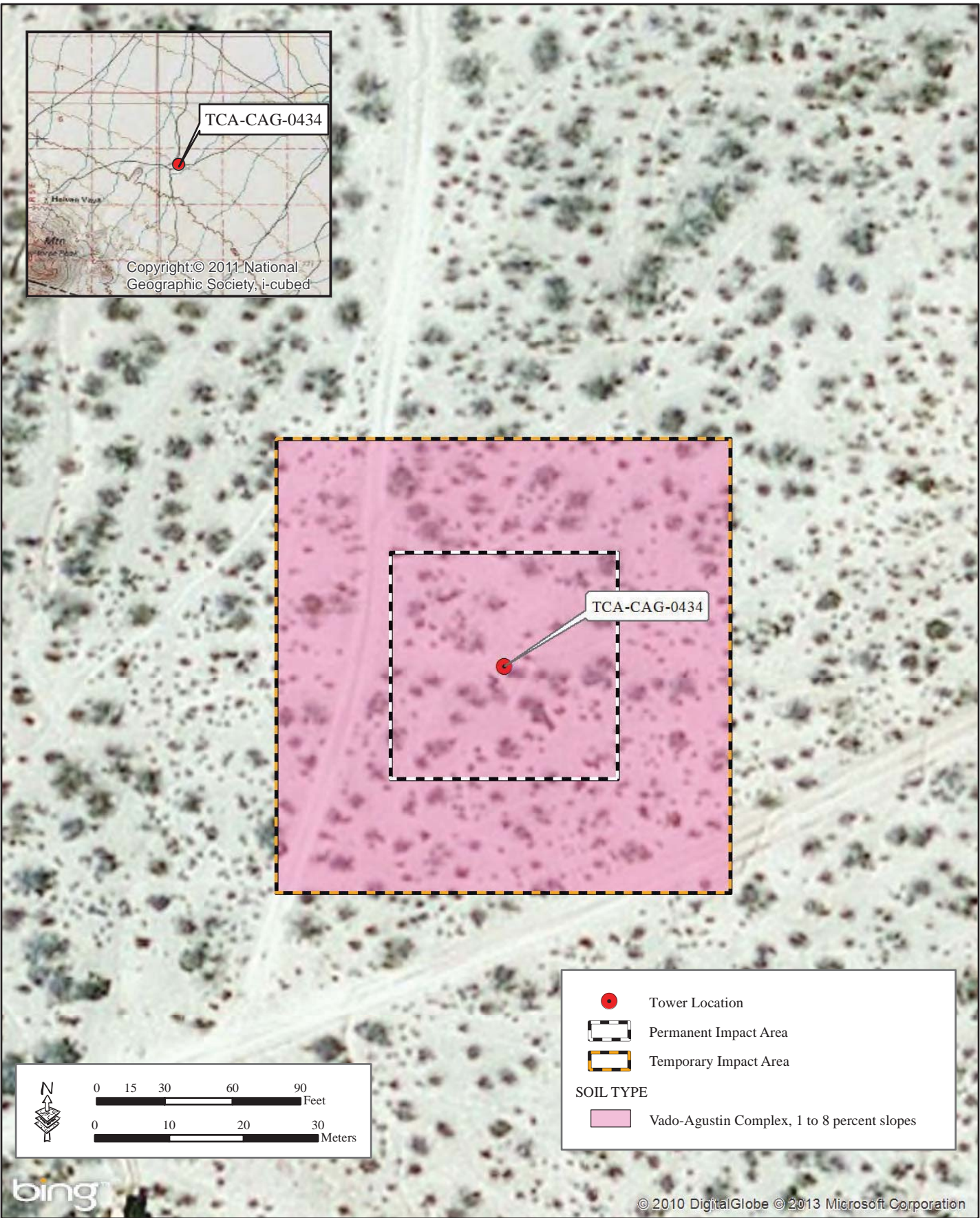
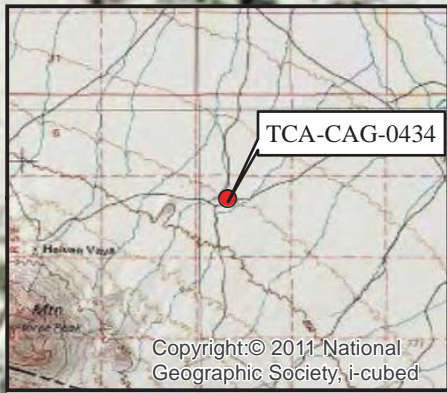
TCA-CAG-0430 Soil Map



TCA-CAG-0432 Soil Map



March 2013



	Tower Location
	Permanent Impact Area
	Temporary Impact Area
SOIL TYPE	
	Vado-Agustin Complex, 1 to 8 percent slopes

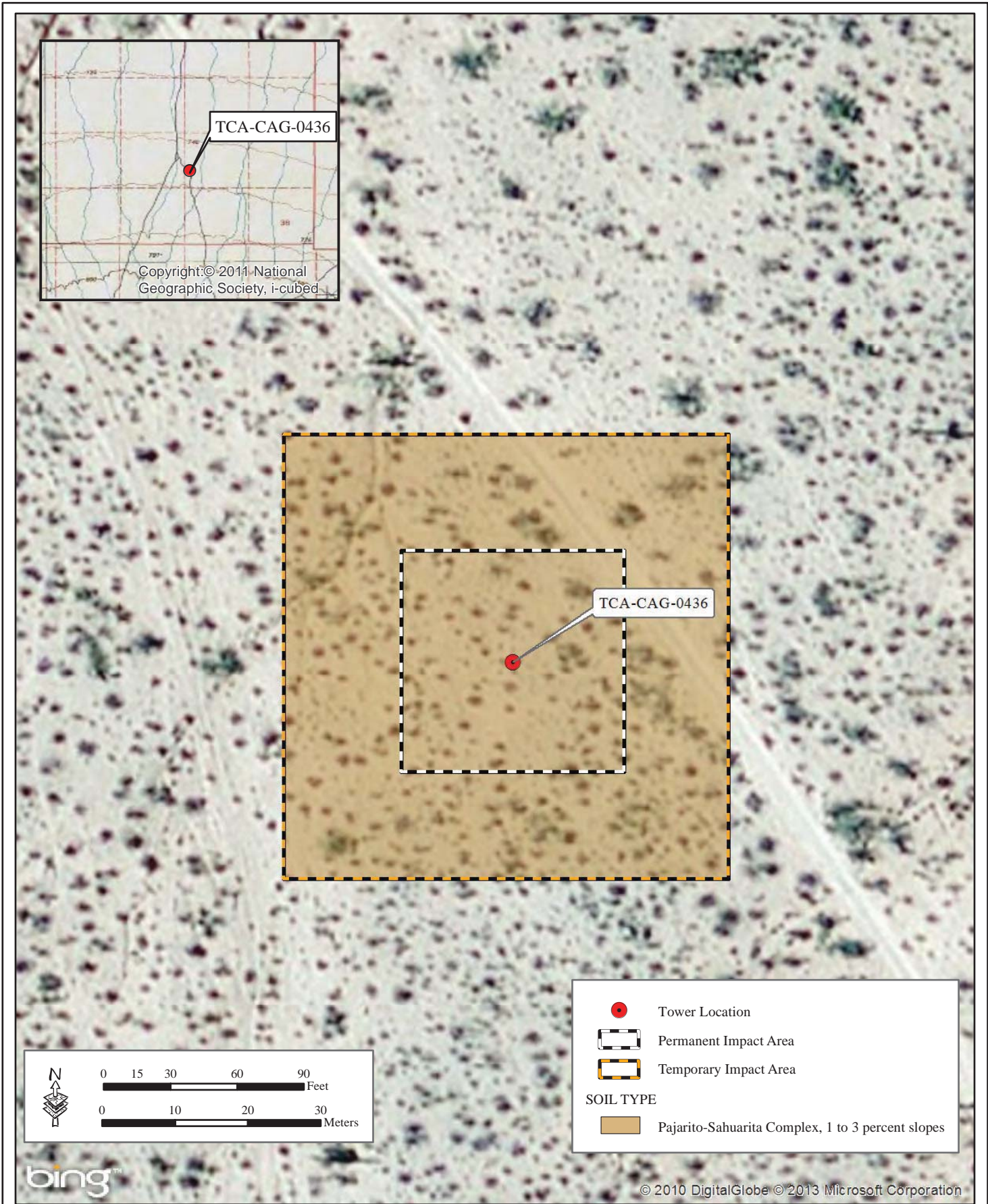
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TCA-CAG-0434 Soil Map



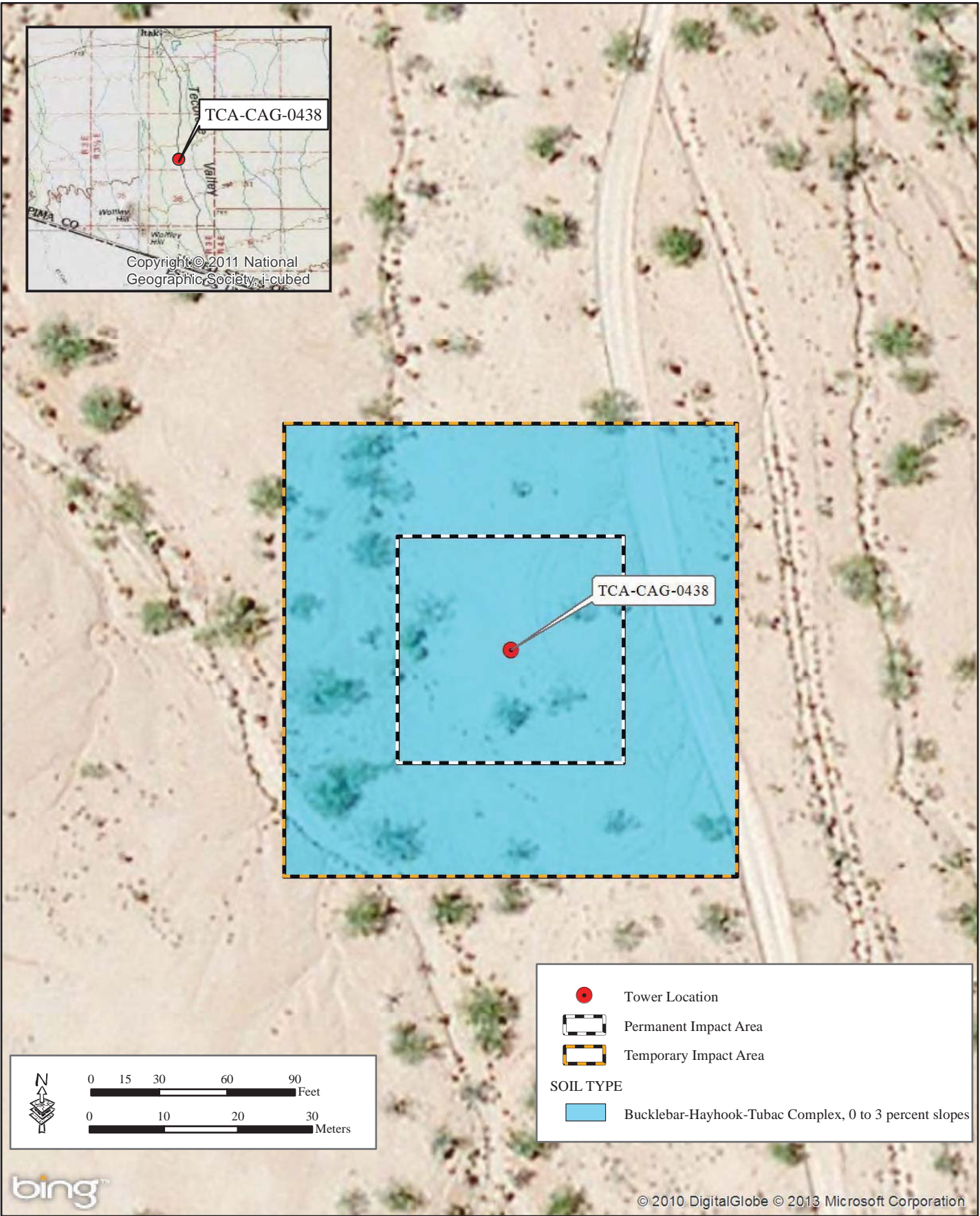
March 2013



TCA-CAG-0436 Soil Map



March 2013



TCA-CAG-0438

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TCA-CAG-0438

● Tower Location

▭ Permanent Impact Area

▭ Temporary Impact Area

SOIL TYPE

■ Bucklebar-Hayhook-Tubac Complex, 0 to 3 percent slopes



0 15 30 60 90 Feet

0 10 20 30 Meters

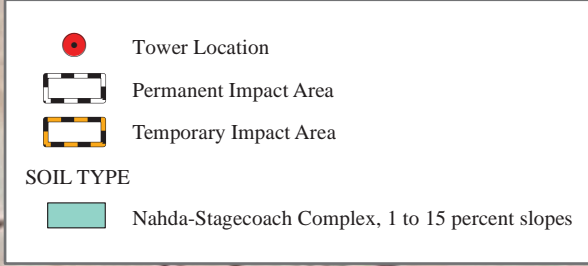
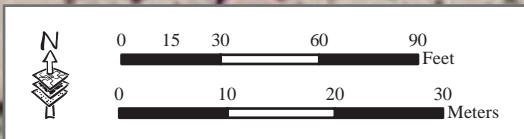
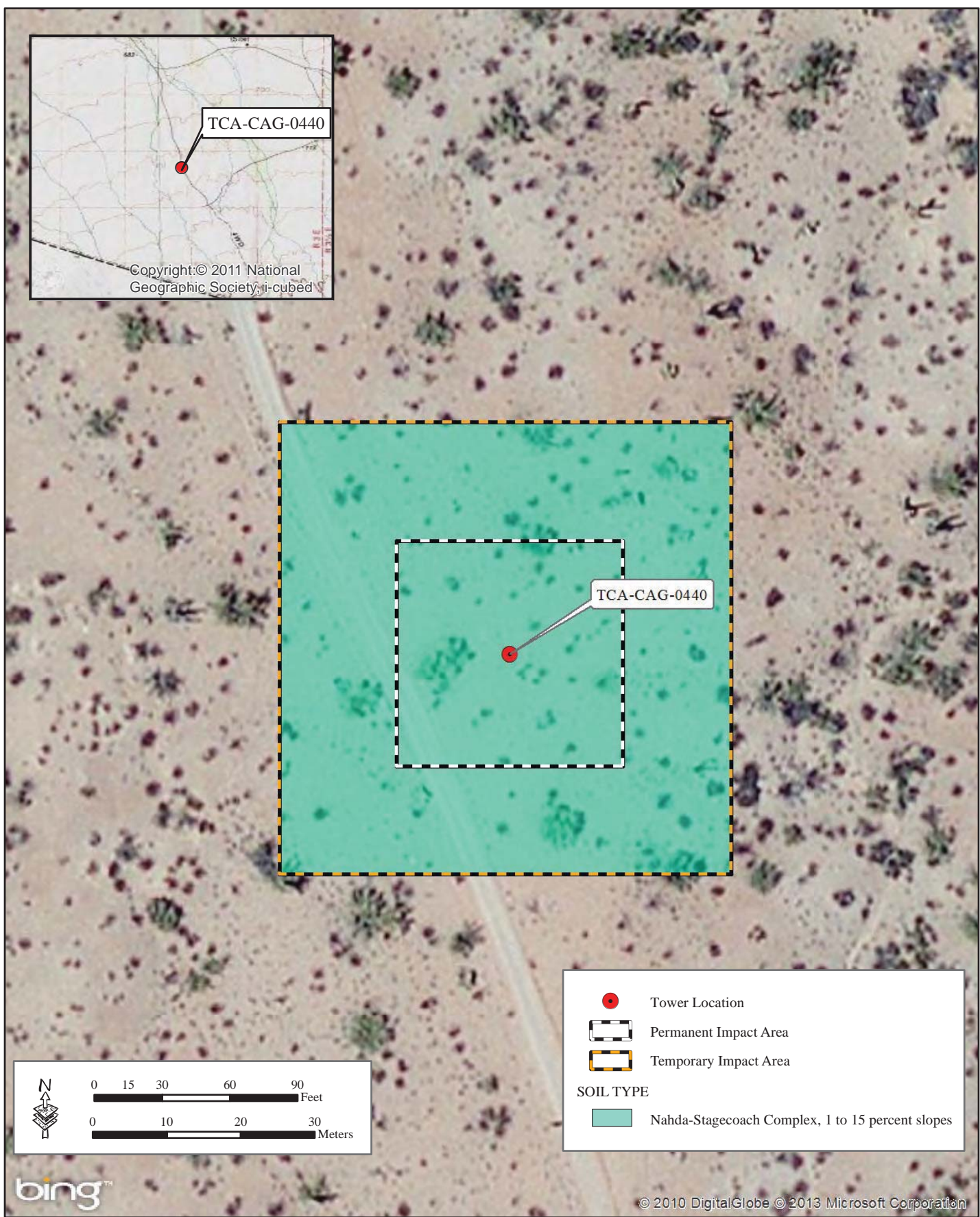


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TCA-CAG--0438 Soil Map



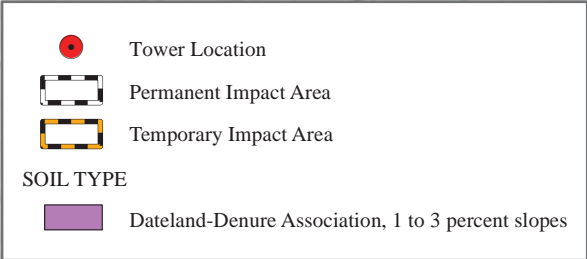
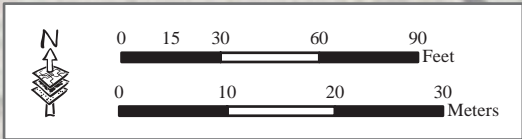
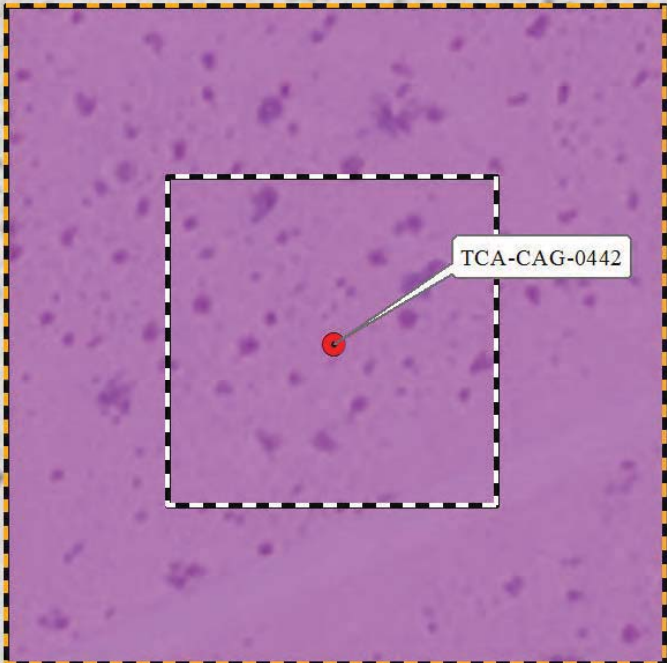
March 2013



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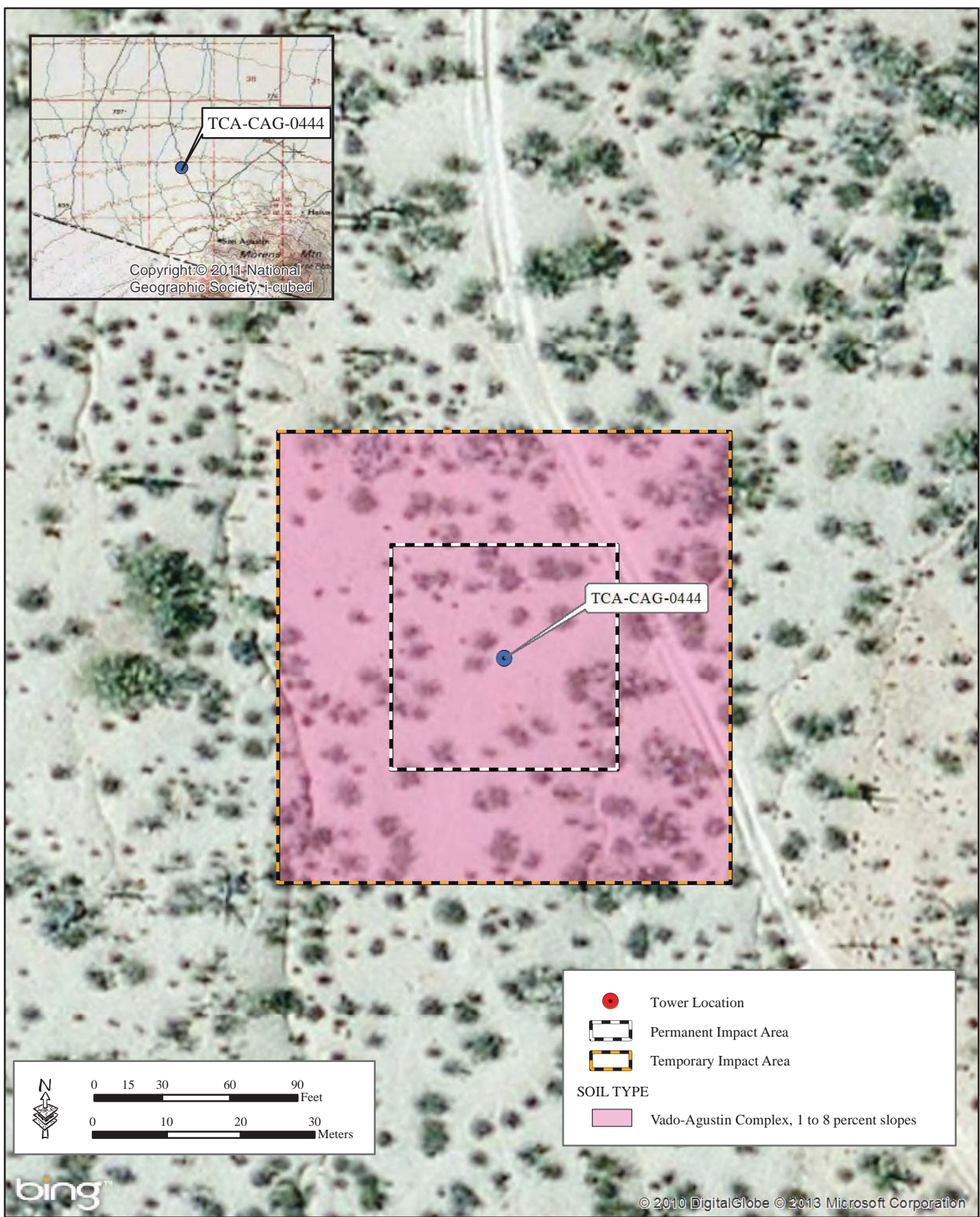
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TCA-CAG-0440 Soil Map



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	Tower Location
	Permanent Impact Area
	Temporary Impact Area
SOIL TYPE	
	Vado-Agustin Complex, 1 to 8 percent slopes

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TCA-CAG-0444 Soil Map

APPENDIX E
WATERS OF THE U.S.



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Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
37*	TCA-AJO-0446	-112.30169	31.7723485	12	30	365	Yes	Yes
33*	TCA-AJO-0446	-112.24789	31.7622612	5	53	264	Yes	Yes
35	TCA-AJO-0446	-112.26010	31.7638038	1	63	63	Yes	Yes
34	TCA-AJO-0446	-112.25957	31.7648007	1	53	53	Yes	Yes
45	TCA-AJO-0448	-112.39934	31.7516747	12	46	550	Yes	Yes
43	TCA-AJO-0448	-112.40851	31.7545756	12	34	408	Yes	Yes
44	TCA-AJO-0448	-112.40096	31.7521315	4	57	229	Yes	Yes
41	TCA-AJO-0448	-112.41702	31.7571539	5	44	221	Yes	Yes
38	TCA-AJO-0448	-112.41931	31.7724344	3	57	172	Yes	Yes
40	TCA-AJO-0448	-112.41825	31.7575104	2	73	146	Yes	Yes
42	TCA-AJO-0448	-112.41412	31.7568279	4	35	141	Yes	Yes
47	TCA-AJO-0448	-112.32137	31.7487279	4	34	138	Yes	Yes
46	TCA-AJO-0448	-112.39126	31.7491768	3	36	107	Yes	Yes
39	TCA-AJO-0448	-112.41896	31.7577075	2	44	89	Yes	Yes
32	TCA-AJO-0450	-112.55438	31.8114805	4	72	288	Yes	Yes
31	TCA-AJO-0450	-112.55030	31.8065093	3	44	133	Yes	Yes
30	TCA-AJO-0450	-112.54907	31.805988	3	39	116	Yes	Yes
26	TCA-AJO-0452	-112.57277	31.9254801	12	55	662	Yes	Yes
29	TCA-AJO-0452	-112.55969	31.9070869	6	60	358	Yes	Yes
27	TCA-AJO-0452	-112.56786	31.9182374	2	103	206	Yes	Yes
28	TCA-AJO-0452	-112.56231	31.9104518	2	87	175	Yes	Yes
23	TCA-AJO-0454	-112.58196	31.9738595	14	70	978	Yes	Yes
21	TCA-AJO-0454	-112.58199	31.9712941	3	71	213	Yes	Yes
25	TCA-AJO-0454	-112.58123	31.9810388	4	35	142	Yes	Yes
24	TCA-AJO-0454	-112.58136	31.9777441	3	40	120	Yes	Yes
22	TCA-AJO-0454	-112.58276	31.972856	3	34	102	Yes	Yes
12	TCA-AJO-0460	-112.66514	32.166754	33	65	2,154	Yes	Yes
2	TCA-AJO-0460	-112.69219	32.160337	20	81	1,623	Yes	Yes
6	TCA-AJO-0460	-112.68190	32.1618377	12	72	863	Yes	Yes
7	TCA-AJO-0460	-112.67781	32.1632108	14	52	735	Yes	Yes
8	TCA-AJO-0460	-112.67306	32.1645439	8	52	413	Yes	Yes

* Surveyed wash that is no longer part of the project

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
14	TCA-AJO-0460	-112.65747	32.1681056	7	54	380	Yes	Yes
10	TCA-AJO-0460	-112.66757	32.1658743	6	51	309	Yes	Yes
5	TCA-AJO-0460	-112.68410	32.1611703	4	75	302	Yes	Yes
15	TCA-AJO-0460	-112.65675	32.1681213	5	58	292	Yes	Yes
13	TCA-AJO-0460	-112.66020	32.1681176	5	51	256	Yes	Yes
4	TCA-AJO-0460	-112.69010	32.1607457	2	124	249	Yes	Yes
9	TCA-AJO-0460	-112.66891	32.1655557	4	60	240	Yes	Yes
3	TCA-AJO-0460	-112.69087	32.1606472	2	55	109	Yes	Yes
11	TCA-AJO-0460	-112.66664	32.1663077	2	52	104	Yes	Yes
1	TCA-AJO-0460	-112.69197	32.1582408	1	97	97	Yes	Yes
16	TCA-AJO-0462	-112.60309	32.0569861	3	192	576	Yes	Yes
19	TCA-AJO-0462	-112.60116	32.0581658	6	76	454	Yes	Yes
18	TCA-AJO-0462	-112.60238	32.0574364	6	70	422	Yes	Yes
20	TCA-AJO-0462	-112.57977	32.0600268	4	55	219	Yes	Yes
17	TCA-AJO-0462	-112.60802	32.0549941	2	55	110	Yes	Yes
244	TCA-CAG-0430	-111.68359	31.5341576	30	109	3,275	Yes	Yes
257	TCA-CAG-0430	-111.68084	31.5545473	27	70	1,901	Yes	Yes
242	TCA-CAG-0430	-111.69158	31.5332905	16	73	1,161	Yes	Yes
263	TCA-CAG-0430	-111.68184	31.5660493	21	50	1,050	Yes	Yes
255	TCA-CAG-0430	-111.68217	31.5532994	18	52	942	Yes	Yes
247	TCA-CAG-0430	-111.68448	31.5391617	12	71	855	Yes	Yes
254	TCA-CAG-0430	-111.68469	31.5483656	12	66	796	Yes	Yes
260	TCA-CAG-0430	-111.68011	31.5610442	14	54	754	Yes	Yes
239	TCA-CAG-0430	-111.74810	31.5477439	8	92	737	Yes	Yes
267	TCA-CAG-0430	-111.68456	31.5723856	8	71	569	Yes	Yes
261	TCA-CAG-0430	-111.68046	31.5621751	8	64	516	Yes	Yes
240	TCA-CAG-0430	-111.73910	31.5449217	10	50	496	Yes	Yes
241	TCA-CAG-0430	-111.69892	31.5321823	7	68	473	Yes	Yes
268	TCA-CAG-0430	-111.68538	31.5730457	2	205	411	Yes	Yes
256	TCA-CAG-0430	-111.68177	31.5537944	7	50	353	Yes	Yes
252	TCA-CAG-0430	-111.68466	31.5459511	6	55	331	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
258	TCA-CAG-0430	-111.67944	31.5577436	5	64	321	Yes	Yes
262	TCA-CAG-0430	-111.68081	31.563242	6	52	314	Yes	Yes
245	TCA-CAG-0430	-111.68436	31.5351182	6	50	301	Yes	Yes
249	TCA-CAG-0430	-111.68454	31.5425219	5	60	298	Yes	Yes
238	TCA-CAG-0430	-111.75767	31.5507397	7	38	263	Yes	Yes
264	TCA-CAG-0430	-111.68186	31.5670308	4	65	260	Yes	Yes
265	TCA-CAG-0430	-111.68220	31.5677113	4	63	252	Yes	Yes
253	TCA-CAG-0430	-111.68483	31.5471313	4	55	219	Yes	Yes
266	TCA-CAG-0430	-111.68300	31.5693133	4	53	211	Yes	Yes
237	TCA-CAG-0430	-111.76820	31.5541089	5	42	210	Yes	Yes
246	TCA-CAG-0430	-111.68445	31.5384918	4	53	210	Yes	Yes
251	TCA-CAG-0430	-111.68458	31.5441441	4	51	203	Yes	Yes
243	TCA-CAG-0430	-111.68299	31.5332221	4	50	202	Yes	Yes
248	TCA-CAG-0430	-111.68449	31.5411476	3	56	168	Yes	Yes
250	TCA-CAG-0430	-111.68456	31.5429665	3	56	167	Yes	Yes
259	TCA-CAG-0430	-111.67987	31.5605299	2	51	101	Yes	Yes
224A	TCA-CAG-0434	-111.83223	31.5855509	30	59	1,770	Yes	Yes
224B	TCA-CAG-0434	-111.83223	31.5855509	30	54	1,620	Yes	Yes
224C	TCA-CAG-0434	-111.83223	31.5855509	30	52	1,560	Yes	Yes
235	TCA-CAG-0434	-111.78241	31.5586039	162	35	5,670	Yes	No
220	TCA-CAG-0434	-111.83884	31.591025	30	51	1,537	Yes	Yes
217	TCA-CAG-0434	-111.84099	31.5927718	30	51	1,517	Yes	Yes
212	TCA-CAG-0434	-111.83945	31.5980154	15	74	1,115	Yes	Yes
228	TCA-CAG-0434	-111.82811	31.5825746	21	52	1,099	Yes	Yes
230	TCA-CAG-0434	-111.82192	31.5773032	20	52	1,042	Yes	Yes
234	TCA-CAG-0434	-111.80960	31.5671363	12	87	1,039	Yes	Yes
221	TCA-CAG-0434	-111.83791	31.5903857	15	57	858	Yes	Yes
236	TCA-CAG-0434	-111.78136	31.5582289	24	35	850	Yes	Yes
269	TCA-CAG-0434	-111.83452	31.588219	10	82	818	Yes	Yes
231	TCA-CAG-0434	-111.82164	31.5754459	15	53	791	Yes	Yes
223	TCA-CAG-0434	-111.83399	31.5875609	12	54	650	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
219	TCA-CAG-0434	-111.83939	31.5914207	12	51	611	Yes	Yes
203	TCA-CAG-0434	-111.84109	31.615641	8	61	489	Yes	Yes
208	TCA-CAG-0434	-111.83966	31.605091	8	54	430	Yes	Yes
209	TCA-CAG-0434	-111.83945	31.5997417	7	51	354	Yes	Yes
211	TCA-CAG-0434	-111.83935	31.5988078	4	83	334	Yes	Yes
226	TCA-CAG-0434	-111.83163	31.5851246	6	55	327	Yes	Yes
270	TCA-CAG-0434	-111.83405	31.5877081	6	54	325	Yes	Yes
210	TCA-CAG-0434	-111.83929	31.5991919	5	59	294	Yes	Yes
206	TCA-CAG-0434	-111.84029	31.6085198	5	52	259	Yes	Yes
218	TCA-CAG-0434	-111.84003	31.5920401	5	52	258	Yes	Yes
233	TCA-CAG-0434	-111.81988	31.5704266	5	51	257	Yes	Yes
216	TCA-CAG-0434	-111.84129	31.5933183	4	64	255	Yes	Yes
215	TCA-CAG-0434	-111.84137	31.5939758	4	60	240	Yes	Yes
232	TCA-CAG-0434	-111.82156	31.5749005	4	60	239	Yes	Yes
204	TCA-CAG-0434	-111.84039	31.610086	3	76	227	Yes	Yes
205	TCA-CAG-0434	-111.84039	31.6098137	4	53	214	Yes	Yes
227	TCA-CAG-0434	-111.83041	31.5841043	4	51	203	Yes	Yes
207	TCA-CAG-0434	-111.83971	31.6074145	3	63	188	Yes	Yes
214	TCA-CAG-0434	-111.84142	31.5944271	3	54	161	Yes	Yes
213	TCA-CAG-0434	-111.84173	31.5948651	2	55	111	Yes	Yes
229	TCA-CAG-0434	-111.82763	31.5822002	2	54	108	Yes	Yes
225	TCA-CAG-0434	-111.83177	31.5852638	2	53	107	Yes	Yes
157	TCA-CAG-0436	-111.91056	31.6507591	25	77	1,920	Yes	Yes
166	TCA-CAG-0436	-111.90693	31.6301805	17	60	1,026	Yes	Yes
168	TCA-CAG-0436	-111.90604	31.6284311	10	82	823	Yes	Yes
164	TCA-CAG-0436	-111.90814	31.6413571	12	57	685	Yes	Yes
163	TCA-CAG-0436	-111.90826	31.6415976	5	100	500	Yes	Yes
167	TCA-CAG-0436	-111.90633	31.6288979	5	99	493	Yes	Yes
162	TCA-CAG-0436	-111.90836	31.6417669	2	233	466	Yes	Yes
169	TCA-CAG-0436	-111.90548	31.6254451	8	53	420	Yes	Yes
161	TCA-CAG-0436	-111.90905	31.6436582	3	133	399	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
160	TCA-CAG-0436	-111.90897	31.6447963	3	124	371	Yes	Yes
272	TCA-CAG-0436	-111.91048	31.6503204	6	57	343	Yes	Yes
155	TCA-CAG-0436	-111.91148	31.6570568	2	170	340	Yes	Yes
154	TCA-CAG-0436	-111.91160	31.654967	6	55	327	Yes	Yes
156	TCA-CAG-0436	-111.91124	31.6516121	4	66	263	Yes	Yes
158	TCA-CAG-0436	-111.91040	31.6497277	3	79	236	Yes	Yes
165	TCA-CAG-0436	-111.90770	31.6333987	3	71	213	Yes	Yes
159	TCA-CAG-0436	-111.90958	31.6475234	3	63	188	Yes	Yes
153	TCA-CAG-0436	-111.91112	31.65628	1	113	113	Yes	Yes
147	TCA-CAG-0438	-111.89889	31.6002112	24	72	1,732	Yes	Yes
119	TCA-CAG-0438	-111.95774	31.6141245	36	36	1,279	Yes	Yes
146	TCA-CAG-0438	-111.89947	31.599777	20	52	1,043	Yes	Yes
144	TCA-CAG-0438	-111.90213	31.5993126	14	56	784	Yes	Yes
145	TCA-CAG-0438	-111.89961	31.59966	13	51	658	Yes	Yes
99	TCA-CAG-0438	-111.99062	31.6507714	10	66	656	Yes	Yes
108	TCA-CAG-0438	-111.97938	31.620692	15	40	601	Yes	Yes
107	TCA-CAG-0438	-111.98253	31.6229732	10	60	600	Yes	Yes
135	TCA-CAG-0438	-111.92459	31.6034282	15	38	569	Yes	Yes
143	TCA-CAG-0438	-111.91592	31.6006949	10	52	520	Yes	Yes
100	TCA-CAG-0438	-111.98612	31.6400294	3	155	465	Yes	Yes
141	TCA-CAG-0438	-111.91844	31.6015006	8	53	424	Yes	Yes
101	TCA-CAG-0438	-111.98482	31.6378942	3	137	410	Yes	Yes
104	TCA-CAG-0438	-111.98342	31.6273778	2	201	402	Yes	Yes
106	TCA-CAG-0438	-111.98255	31.6248715	2	198	396	Yes	Yes
148	TCA-CAG-0438	-111.89697	31.6034615	3	121	362	Yes	Yes
117	TCA-CAG-0438	-111.95999	31.614596	8	39	310	Yes	Yes
102	TCA-CAG-0438	-111.98400	31.6291511	4	76	303	Yes	Yes
182	TCA-CAG-0438	-111.97536	31.6194217	5	56	282	Yes	Yes
105	TCA-CAG-0438	-111.98269	31.6253919	2	127	254	Yes	Yes
271	TCA-CAG-0438	-111.98002	31.6208546	6	42	251	Yes	Yes
109	TCA-CAG-0438	-111.97914	31.6206008	5	50	251	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
130	TCA-CAG-0438	-111.98245	31.6216568	6	38	228	Yes	Yes
136	TCA-CAG-0438	-111.92791	31.6044794	3	76	227	Yes	Yes
113	TCA-CAG-0438	-111.97154	31.6182269	6	38	225	Yes	Yes
122	TCA-CAG-0438	-111.94681	31.6104279	6	37	222	Yes	Yes
121	TCA-CAG-0438	-111.94944	31.6112447	5	44	221	Yes	Yes
138	TCA-CAG-0438	-111.92233	31.6027157	3	74	221	Yes	Yes
132	TCA-CAG-0438	-111.92941	31.6049534	6	37	221	Yes	Yes
131	TCA-CAG-0438	-111.93175	31.6056968	3	72	215	Yes	Yes
115	TCA-CAG-0438	-111.96817	31.6171678	5	43	215	Yes	Yes
124	TCA-CAG-0438	-111.94479	31.6097896	3	70	210	Yes	Yes
134	TCA-CAG-0438	-111.92753	31.604349	3	65	194	Yes	Yes
125	TCA-CAG-0438	-111.94354	31.6093942	4	48	193	Yes	Yes
129	TCA-CAG-0438	-111.93686	31.6072851	4	46	186	Yes	Yes
111	TCA-CAG-0438	-111.97825	31.6205153	5	36	178	Yes	Yes
120	TCA-CAG-0438	-111.95347	31.612528	5	35	176	Yes	Yes
128	TCA-CAG-0438	-111.93430	31.6064942	4	41	165	Yes	Yes
112	TCA-CAG-0438	-111.97458	31.6191404	3	55	165	Yes	Yes
110	TCA-CAG-0438	-111.97892	31.6205422	4	36	146	Yes	Yes
133	TCA-CAG-0438	-111.92854	31.6047188	4	36	145	Yes	Yes
116	TCA-CAG-0438	-111.96376	31.6157154	4	35	141	Yes	Yes
114	TCA-CAG-0438	-111.97125	31.6181446	3	45	136	Yes	Yes
103	TCA-CAG-0438	-111.98351	31.6278357	1	133	133	Yes	Yes
140	TCA-CAG-0438	-111.92030	31.6020772	2	66	132	Yes	Yes
127	TCA-CAG-0438	-111.93742	31.6074756	3	38	113	Yes	Yes
126	TCA-CAG-0438	-111.94284	31.6093368	3	37	110	Yes	Yes
118	TCA-CAG-0438	-111.95963	31.6144632	3	35	105	Yes	Yes
98	TCA-CAG-0438	-111.99052	31.6512125	2	51	102	Yes	Yes
139	TCA-CAG-0438	-111.92179	31.6025562	2	46	92	Yes	Yes
142	TCA-CAG-0438	-111.91680	31.6009886	2	36	71	Yes	Yes
123	TCA-CAG-0438	-111.94563	31.610078	1	54	54	Yes	Yes
137	TCA-CAG-0438	-111.92332	31.6030432	1	36	36	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
83	TCA-CAG-0440	-112.00900	31.6300238	36	71	2,565	Yes	Yes
72	TCA-CAG-0440	-112.02788	31.6361683	56	40	2,252	Yes	Yes
84	TCA-CAG-0440	-112.00054	31.6273547	15	50	745	Yes	Yes
78	TCA-CAG-0440	-112.01788	31.6327959	20	35	700	Yes	Yes
97	TCA-CAG-0440	-111.98521	31.6235231	18	38	693	Yes	Yes
89	TCA-CAG-0440	-111.99712	31.626255	10	54	544	Yes	Yes
71	TCA-CAG-0440	-112.02923	31.6363701	12	37	441	Yes	Yes
69	TCA-CAG-0440	-112.03261	31.6374057	10	43	425	Yes	Yes
80	TCA-CAG-0440	-112.01502	31.6319434	12	35	423	Yes	Yes
81	TCA-CAG-0440	-112.01450	31.6317814	8	45	359	Yes	Yes
273	TCA-CAG-0440	-111.99500	31.625565	7	45	317	Yes	Yes
36	TCA-CAG-0440	-111.99465	31.6254606	6	50	298	Yes	Yes
94	TCA-CAG-0440	-111.99122	31.6243928	8	36	288	Yes	Yes
82	TCA-CAG-0440	-112.01138	31.6307809	8	35	283	Yes	Yes
76	TCA-CAG-0440	-112.01953	31.6333299	6	44	266	Yes	Yes
96	TCA-CAG-0440	-111.98674	31.6235926	6	33	200	Yes	Yes
67	TCA-CAG-0440	-112.03846	31.6587938	3	60	181	Yes	Yes
86	TCA-CAG-0440	-112.00015	31.6272143	4	43	174	Yes	Yes
66	TCA-CAG-0440	-112.03976	31.659644	3	55	166	Yes	Yes
68	TCA-CAG-0440	-112.03192	31.6420418	3	52	157	Yes	Yes
77	TCA-CAG-0440	-112.01879	31.6331076	3	48	145	Yes	Yes
87	TCA-CAG-0440	-111.99941	31.6269727	3	45	136	Yes	Yes
93	TCA-CAG-0440	-111.99311	31.625006	2	67	134	Yes	Yes
92	TCA-CAG-0440	-111.99331	31.6250728	2	66	133	Yes	Yes
90	TCA-CAG-0440	-111.99674	31.6261513	3	40	121	Yes	Yes
95	TCA-CAG-0440	-111.98908	31.6240125	3	40	120	Yes	Yes
91	TCA-CAG-0440	-111.99640	31.6260677	3	39	116	Yes	Yes
75	TCA-CAG-0440	-112.02238	31.634205	3	38	115	Yes	Yes
85	TCA-CAG-0440	-112.00024	31.6272347	3	38	113	Yes	Yes
74	TCA-CAG-0440	-112.02376	31.6346079	2	56	113	Yes	Yes
88	TCA-CAG-0440	-111.99970	31.6271468	2	39	78	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
79	TCA-CAG-0440	-112.01592	31.6321832	2	37	73	Yes	Yes
70	TCA-CAG-0440	-112.03100	31.6370584	2	36	71	Yes	Yes
73	TCA-CAG-0440	-112.02502	31.6350376	2	36	71	Yes	Yes
52	TCA-CAG-0442 n	-112.10693	31.7399589	16	58	933	Yes	Yes
49	TCA-CAG-0442 n	-112.11146	31.7359874	16	52	829	Yes	Yes
61	TCA-CAG-0442 n	-112.09987	31.7455878	10	50	500	Yes	Yes
54	TCA-CAG-0442 n	-112.10863	31.7383192	6	78	468	Yes	Yes
58	TCA-CAG-0442 n	-112.10221	31.7434764	8	50	400	Yes	Yes
50	TCA-CAG-0442 n	-112.11041	31.7367165	6	58	348	Yes	Yes
60	TCA-CAG-0442 n	-112.10062	31.7450518	5	52	258	Yes	Yes
59	TCA-CAG-0442 n	-112.10264	31.7431206	5	49	247	Yes	Yes
64	TCA-CAG-0442 n	-112.05519	31.6928284	4	58	231	Yes	Yes
57	TCA-CAG-0442 n	-112.10277	31.7430348	4	52	209	Yes	Yes
48	TCA-CAG-0442 n	-112.11302	31.7354625	4	51	206	Yes	Yes
56	TCA-CAG-0442 n	-112.10295	31.742921	4	48	192	Yes	Yes
55	TCA-CAG-0442 n	-112.10542	31.7409181	3	62	187	Yes	Yes
65	TCA-CAG-0442 n	-112.05416	31.6886534	3	51	153	Yes	Yes
63	TCA-CAG-0442 n	-112.07397	31.716122	2	67	134	Yes	Yes
51	TCA-CAG-0442 n	-112.10820	31.7388307	2	60	119	Yes	Yes
53	TCA-CAG-0442 n	-112.10639	31.740253	2	54	108	Yes	Yes
62	TCA-CAG-0442 n	-112.09800	31.7462105	2	52	105	Yes	Yes
149	TCA-CAG-0444	-111.89930	31.6125119	30	77	2,297	Yes	Yes
170	TCA-CAG-0444	-111.89710	31.6126413	21	76	1,586	Yes	Yes
173	TCA-CAG-0444	-111.88835	31.6209661	25	60	1,500	Yes	Yes
194	TCA-CAG-0444	-111.85331	31.6195301	15	79	1,183	Yes	Yes
171	TCA-CAG-0444	-111.89405	31.6164412	18	60	1,072	Yes	Yes
178	TCA-CAG-0444	-111.87973	31.6230062	14	62	867	Yes	Yes
174	TCA-CAG-0444	-111.88198	31.6248672	15	53	801	Yes	Yes
190	TCA-CAG-0444	-111.85938	31.61786	6	109	657	Yes	Yes
180	TCA-CAG-0444	-111.87759	31.6210385	12	53	636	Yes	Yes
150	TCA-CAG-0444	-111.89871	31.6123495	12	53	636	Yes	Yes

Waters of the United States

GIS_ID	Tower ID	Longitude	Latitude	Width (ft)	Length (ft)	Area (ft ²)	Compliant with Nationwide 14 Permit?	Compliant with Pre-construction Notice?
191	TCA-CAG-0444	-111.85850	31.6180164	8	78	624	Yes	Yes
185	TCA-CAG-0444	-111.87276	31.6148631	8	75	597	Yes	Yes
201	TCA-CAG-0444	-111.84263	31.6181891	9	58	523	Yes	Yes
198	TCA-CAG-0444	-111.85015	31.6194414	10	50	505	Yes	Yes
188	TCA-CAG-0444	-111.86503	31.6150839	7	54	376	Yes	Yes
151	TCA-CAG-0444	-111.90451	31.6207139	2	185	369	Yes	Yes
181	TCA-CAG-0444	-111.90394	31.619931	6	59	355	Yes	Yes
172	TCA-CAG-0444	-111.89226	31.6176842	4	80	322	Yes	Yes
175	TCA-CAG-0444	-111.88168	31.6246875	6	51	308	Yes	Yes
202	TCA-CAG-0444	-111.84195	31.6178992	5	52	260	Yes	Yes
193	TCA-CAG-0444	-111.85645	31.6187455	4	62	248	Yes	Yes
192	TCA-CAG-0444	-111.85821	31.6180266	4	61	242	Yes	Yes
195	TCA-CAG-0444	-111.85284	31.6194865	4	54	215	Yes	Yes
186	TCA-CAG-0444	-111.86650	31.6152035	3	66	197	Yes	Yes
152	TCA-CAG-0444	-111.90505	31.6206451	2	96	192	Yes	Yes
187	TCA-CAG-0444	-111.86584	31.6150898	3	62	185	Yes	Yes
176	TCA-CAG-0444	-111.88120	31.6243181	3	55	166	Yes	Yes
179	TCA-CAG-0444	-111.87827	31.6218418	3	55	165	Yes	Yes
177	TCA-CAG-0444	-111.88026	31.6234224	3	50	151	Yes	Yes
199	TCA-CAG-0444	-111.84804	31.6190041	2	74	148	Yes	Yes
184	TCA-CAG-0444	-111.84845	31.6190958	1	136	136	Yes	Yes
189	TCA-CAG-0444	-111.86250	31.6162093	2	63	125	Yes	Yes
183	TCA-CAG-0444	-111.87402	31.6149617	2	62	125	Yes	Yes
200	TCA-CAG-0444	-111.84554	31.6187771	2	60	120	Yes	Yes
197	TCA-CAG-0444	-111.85040	31.6194518	2	57	114	Yes	Yes
196	TCA-CAG-0444	-111.85102	31.6195408	1	78	78	Yes	Yes
222*	TCA-CAG-0446	-112.30172	31.7711758	2	31	63	Yes	Yes

* Surveyed wash that is no longer part of the project

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APPENDIX F
ARIZONA NATURAL HERITAGE PROGRAM (ANHP)
SPECIAL STATUS SPECIES LIST

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**Special Status Species by County, Taxon, Scientific Name
Arizona Game and Fish Department, Heritage Data Management System
Updated: November 12, 2015**

(Pima County)

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ELCODE	ESA	BLM	USFS	NESL	MEXFED	SGCN	NPL	GRANK	S RANK
Pima	AMPHIBIAN	Anaxyrus retiliformis	Sonoran Green Toad	AAAABB01140		S			PR	1B		G4	S3
Pima	AMPHIBIAN	Craugastor augusti cactorum	Western Barking Frog	AAABDD04171			S			1B		G5T5	S2
Pima	AMPHIBIAN	Gastrophryne olivacea	Western Narrow-mouthed Toad	AAABE01020				PR		1C		G5	S3
Pima	AMPHIBIAN	Lithobates chiricahuensis	Chiricahua Leopard Frog	AAABH01080	LT		S		A	1A		G2G3	S2
Pima	AMPHIBIAN	Lithobates tarahumarae	Tarahumara Frog	AAABH01210	SC		S			1A		G3	SXS1
Pima	AMPHIBIAN	Lithobates yavapaiensis	Lowland Leopard Frog	AAABH01250	SC	S	S		PR	1A		G4	S3
Pima	AMPHIBIAN	Smilisca fodiens	Lowland Burrowing Treefrog	AAABC06010	SC	S				1B		G4	S2
Pima	BIRD	Accipiter gentilis	Northern Goshawk	ABNKC12060	SC	S	S	4	A	1B		G5	S3
Pima	BIRD	Amazilia violiceps	Violet-crowned Hummingbird	ABNUC29150		S				1B		G5	S3
Pima	BIRD	Ammodramus bairdii	Baird's Sparrow	ABPXA0010	SC	S	S			1C		G4	S2N
Pima	BIRD	Ammodramus savannarum ammodramus	Arizona grasshopper sparrow	ABPXA0021		S	S			1B		G5TU	S1S2
Pima	BIRD	Antrostomus ridgwayi	Buff-collared Nighthawk	ABNTA07060			S			1B		G5	S2S3
Pima	BIRD	Aquila chrysaetos	Golden Eagle	ABNKC22010		S		3	A	1B		G5	S4
Pima	BIRD	Athene cucularia hypugaea	Western Burrowing Owl	ABNSB10012	SC	S	S	4	PR	1B		G4T4	S3
Pima	BIRD	Buteo plagiatus	Gray Hawk	ABNKC19150	SC							GNR	S3
Pima	BIRD	Camptostoma imberbe	Northern Beardless-Tyrannulet	ABPAE04010			S			1B		G5	S4
Pima	BIRD	Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	ABNRB02020	LT		S	2		1A		G5	S3
Pima	BIRD	Colinus virginianus ridgwayi	Masked Bobwhite	ABNLC21022	LE				P	1A		G5T1	S1
Pima	BIRD	Dendrocoryna bicolor	Fulvous Whistling-Duck	ABNJB01010	SC							G5	SAN
Pima	BIRD	Empidonax fulvifrons pygmaeus	Northern Buff-breasted Flycatcher	ABPAE33141	SC		S			1B		G5T5	S1
Pima	BIRD	Empidonax traillii eximius	Southwestern Willow Flycatcher	ABPAE33043	LE			2	E	1A		G5T2	S1
Pima	BIRD	Falco peregrinus anatum	American Peregrine Falcon	ABNKD06071	SC	S	S	4	PR	1A		G4T4	S4
Pima	BIRD	Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	ABNSB08041	SC	S	S			1B		G5T3	S1
Pima	BIRD	Pachyrhamphus aglaiae	Rose-throated Becard	ABPAE53070			S			1B		G4G5	S1
Pima	BIRD	Peuceea botterii arizonae	Arizona Botteri's Sparrow	ABPBX91063		S				1B		G4T4	S3?B
Pima	BIRD	Rallius longirostris yumanensis	Yuma Clapper Rail	ABNME0501A	LE				A	1A		G5T3	S3
Pima	BIRD	Strix occidentalis lucida	Mexican Spotted Owl	ABNSB12012	LT			3	A	1A		G3T3	S3S4
Pima	BIRD	Toxostoma lecontei	Le Conte's Thrasher	ABPBK06100						1B		G4	S3
Pima	BIRD	Trogon elegans	Elegant Trogon	ABNWA02070			S			1B		G5	S3
Pima	BIRD	Tyrannus crassirostris	Thick-billed Kingbird	ABPAE52040			S			1B		G5	S2
Pima	FISH	Agosia chrysogaster chrysogaster	Gila Longfin Dace	AFCJB37151	SC	S	S		A	1B		G4T3T4	S3S4
Pima	FISH	Catostomus clarkii	Desert Sucker	AFCJC02040	SC	S	S			1B		G3G4	S3S4
Pima	FISH	Cyprinodon eremus	Quitobaquito Pupfish	AFCNB02140	LE					1A		G1	S1
Pima	FISH	Cyprinodon macularius	Desert Pupfish	AFCNB02060	LE				P	1A		G1	S1
Pima	FISH	Gila intermedia	Gila Chub	AFCJB13160	LE				P	1A		G2	S2

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ELCODE	ESA	BLM	USFS	NESL	MEXFED	SGCN	NPL	GRANK	S RANK
Pima	FISH	Poeciliopsis occidentalis occidentalis	Gila Topminnow	AFCNC05021	LE				A	1A		G3	S1S2
Pima	INVERTEBRATE	Argia sabino	Sabino Canyon Dancer	IODO68100	SC		S					G2	S2
Pima	INVERTEBRATE	Sonorella eremita	San Xavier Talussnail	IMGASC9240	CCA					1A		G1	S1
Pima	INVERTEBRATE	Sonorella magdalenensis	Sonoran Talussnail	IMGASC9370	SC		S			1C		G2G3	S2
Pima	INVERTEBRATE	Tryonia quitobaquita	Quitobaquito Tryonia	IMGASJ7130	SC					1A		G1	S1
Pima	MAMMAL	Antilocapra americana sonoriensis	Sonoran Pronghorn	AMALD01012	LE				P	1A		G5T1	S1
Pima	MAMMAL	Baiomys taylori	Northern Pygmy Mouse	AMAFF05010	SC		S					G4G5	S3
Pima	MAMMAL	Choeronycteris mexicana	Mexican Long-tongued Bat	AMACB02010	SC	S	S		A	1C		G4	S3
Pima	MAMMAL	Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	AMACC08014	SC	S	S	4		1B		G3G4T3T4	S3S4
Pima	MAMMAL	Cynomys ludovicianus	Black-tailed Prairie Dog	AMAFB06010	SC	S			A	1A		G4	SXS1
Pima	MAMMAL	Eumops perotis californicus	Greater Western Bonneted Bat	AMACD02011	SC	S				1B		G5T4	S3
Pima	MAMMAL	Eumops underwoodi	Underwood's Bonneted Bat	AMACD02020	SC					1B		G4	S1
Pima	MAMMAL	Lasiurus bosssevillii	Western Red Bat	AMACC05060	SC	S	S			1B		G5	S3
Pima	MAMMAL	Lasiurus xanthinus	Western Yellow Bat	AMACC05070	SC	S				1B		G5	S2S3
Pima	MAMMAL	Leopardus pardalis	Ocelot	AMAJH05010	LE				P	1A		G4	S1
Pima	MAMMAL	Leptonycteris curasoae yerbabuena	Lesser Long-nosed Bat	AMACB03030	LE				A	1A		G4	S2S3
Pima	MAMMAL	Macrotus californicus	California Leaf-nosed Bat	AMACB01010	SC	S				1B		G4	S3
Pima	MAMMAL	Myotis occultus	Arizona Myotis	AMACC01160	SC	S				1B		G4	S3
Pima	MAMMAL	Myotis thysanodes	Fringed Myotis	AMACC01090	SC	S				1B		G4	S3S4
Pima	MAMMAL	Myotis velifer	Cave Myotis	AMACC01050	SC	S				1B		G5	S3S4
Pima	MAMMAL	Nyctinomops macrotis	Big Free-tailed Bat	AMACD04020	SC							G5	S3
Pima	MAMMAL	Panthera onca	Jaguar	AMAJH02010	LE				P	1A		G3	S1
Pima	MAMMAL	Peromyscus merriami	Merriam's Deer mouse	AMAFF03020	SC	S	S					G5	S2
Pima	MAMMAL	Sorex arizonae	Arizona Shrew	AMABA01240	SC		S		P	1B		G3	S2
Pima	PLANT	Abrutium parishii	Pima Indian Mallow	PDMAL020E0	SC	S	S				SR	G2	S3
Pima	PLANT	Agave parviflora ssp. parviflora	Santa Cruz Striped Agave	PMAGA010L2	SC		S		A		HS	G3T3	S3
Pima	PLANT	Agave schottii var. treleasei	Treelase Agave	PMAGA010N2	SC		S				HS	G5T1Q	S1
Pima	PLANT	Allium goodingii	Gooding Onion	PMLIL02120	CCA		S	3			HS	G4	S3S4
Pima	PLANT	Allium plummerae	Plummer Onion	PMLIL021V0	SC		S				SR	G4	S3
Pima	PLANT	Anoreuxia gonzalezii	Saiya	PDBIX01010	SC	S	S				HS	G1	S1
Pima	PLANT	Ansonia grandiflora	Large-flowered Blue Star	PDAP03060	SC		S					G2	S2
Pima	PLANT	Ansonia kearneyana	Kearney's Blue-star	PDAP030M0	LE		S				HS	G1	S1
Pima	PLANT	Asclepias lemmonii	Lemmon Milkweed	PDASC020Z0	SC		S					G4?	S2
Pima	PLANT	Asplenium dalhousiae	Dalhousie Spleenwort	PPASP020A0	SC	S						GNR	S1
Pima	PLANT	Ayenia jaliscana	Ayenia	PDSTE010C0	SC		S					GNR	S1
Pima	PLANT	Berberis harrisoniana	Kofa Mt Barberry	PDBER02030	SC	S						G1G2	S1
Pima	PLANT	Capsicum annuum var. glabrusculum	Chiltepin	PDSOL06012	SC		S					G5T5	S2
Pima	PLANT	Carex chihuahuensis	Chihuahuan Sedge	PMCP032T0	SC		S					G3G4	S2S3
Pima	PLANT	Carex ultra	Arizona Giant Sedge	PMCP03E50	SC	S	S					G3?	S2

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ELCODE	ESA	BLM	USFS	NESL	MEXFED	SGCN	NPL	GRANK	S RANK
Pima	PLANT	<i>Coryphantha scheeri</i> var. <i>robustispina</i>	Pima Pineapple Cactus	PDCAC040C1	LE						HS	G4T2	S2
Pima	PLANT	<i>Cylindropuntia x kelvinensis</i>	Kelvin Cholla	PDCAC002M0							SR	GNA	SHYB
Pima	PLANT	<i>Dalea tentaculoides</i>	Gentry's Indigo Bush	PDFAB1A1K0	SC	S	S				HS	G1	S1
Pima	PLANT	<i>Echinocactus horizonthalonius</i> var. <i>nicholii</i>	Nichol Turk's Head Cactus	PDCAC050Z2	LE						HS	G4T2	S2
Pima	PLANT	<i>Echinocereus fasciculatus</i>	Magenta-flower Hedgehog-cactus	PDCAC06065							SR	G4G5T4T5	S3
Pima	PLANT	<i>Echinomastus erectocentrus</i> var. <i>acuminis</i>	Acuna Cactus	PDCAC0J0E1	LE			P			HS	G3T1T2Q	S1
Pima	PLANT	<i>Echinomastus erectocentrus</i> var. <i>erectocentrus</i>	Needle-spined Pineapple Cactus	PDCAC0J0E2	SC						SR	G3T3Q	S3
Pima	PLANT	<i>Echinomastus intertextus</i>	White Fishhook Cactus	PDCAC0J0G0							SR	G4G5	S2
Pima	PLANT	<i>Eriogon arisolius</i>	Arid Throne Fleabane	PDAST3M510		S						G2	S2
Pima	PLANT	<i>Eriogon piscaticus</i>	Fish Creek Fleabane	PDAST3M4X0	SC	S	S				SR	G1	S1
Pima	PLANT	<i>Eriogonum capillare</i>	San Carlos Wild-buckwheat	PDPGN08100	SC						SR	G4	S4
Pima	PLANT	<i>Eriogonum terrenatum</i>	San Pedro River Wild Buckwheat	PDPGN08760		S						G1	S1S2
Pima	PLANT	<i>Ferocactus cylindraceus</i>	Desert Barrel Cactus	PDCAC08080				PR			SR	G5	S4
Pima	PLANT	<i>Ferocactus emoryi</i>	Emory's Barrel-cactus	PDCAC08090							SR	G4	S1S2
Pima	PLANT	<i>Graptopetalum bartramii</i>	Bartram Stonecrop	PDCRA06010	SC	S	S				SR	G3	S3
Pima	PLANT	<i>Heterotheca rutteri</i>	Huachuca Golden Aster	PDAST4V0J0	SC	S	S					G2	S2
Pima	PLANT	<i>Hexaletris arizonica</i>	Arizona Crested coral-root	PMORC1C041			S				SR	G5T2T4	S1S2
Pima	PLANT	<i>Hexaletris colemanii</i>	Coleman's coral-root	PMORC1C060			S					G1G2	S2
Pima	PLANT	<i>Hieracium pringlei</i>	Pringle Hawkweed	PDAST4W170	SC							G2Q	S1
Pima	PLANT	<i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i>	Huachuca Water-umbel	PDAP19051	LE						HS	G4T2	S2
Pima	PLANT	<i>Lilium parryi</i>	Lemon Lily	PMLL1A0J0	SC		S				SR	G3	S2
Pima	PLANT	<i>Listera convallarioides</i>	Broad-leaved Twayblade	PMORC1N050							SR	G5	S1
Pima	PLANT	<i>Lobelia fenestralis</i>	Leafy Lobelia	PDCAM0E0H0							SR	G4	S1
Pima	PLANT	<i>Lophocereus schottii</i>	Senita	PDCAC14010					I		SR	G4	S1S2
Pima	PLANT	<i>Lupinus huachucanus</i>	Huachuca Mountain Lupine	PDFAB2B210		S						G2	S2
Pima	PLANT	<i>Lupinus lemmonii</i>	Lemmon's Lupine	PDFAB2B2A0		S						G1Q	S1Q
Pima	PLANT	<i>Lysiloma watsonii</i>	Littleleaf False Tamarind	PDFAB2C040							SR	G4?	S1
Pima	PLANT	<i>Malaxis abieticola</i>	Slender-flowered Malaxis	PMORC1R090							SR	G4	S1
Pima	PLANT	<i>Mammillaria heyderi</i> var. <i>bullingtoniana</i>	Cream Cactus	PDCAC0A035							SR	G4?T2T4	S1S2
Pima	PLANT	<i>Mammillaria mainiae</i>	Counter Clockwise Fishhook Cactus	PDCAC0A060							SR	G3	S1
Pima	PLANT	<i>Mammillaria thomberi</i>	Thornber Fishhook Cactus	PDCAC0A0C0							SR	G4	S4
Pima	PLANT	<i>Mammillaria viridiflora</i>	Varied Fishhook Cactus	PDCAC0A0D0							SR	G4	S4
Pima	PLANT	<i>Manihot davidisae</i>	Arizona Manihot	PDEUP0Z010			S					G4	S2
Pima	PLANT	<i>Metastelma mexicanum</i>	Wiggins Milkweed Vine	PDASC050F0	SC		S					G3G4	S1S2
Pima	PLANT	<i>Muhlenbergia elongata</i>	Sycamore Muhtly	PMPOA48Z20			S					G3	S1
Pima	PLANT	<i>Notholaena lemmonii</i>	Lemmon Cloak Fern	PPADJ0G0D0	SC							G3?	S1S2
Pima	PLANT	<i>Opuntia engelmannii</i> var. <i>flavispina</i>	Opuntia Engelmannii	PDCAC0D2Z4							SR	G5T3?	S3?
Pima	PLANT	<i>Opuntia versicolor</i>	Opuntia versicolor	PDCAC0D1K0							SR	G4	S2S3
Pima	PLANT	<i>Packera neomexicana</i> var. <i>tourmeyii</i>	Tourney Groundsel	PDAST8H274			S					G5T2Q	S2

COUNTY	TAXON	SCIENTIFIC NAME	COMMON NAME	ELCODE	ESA	BLM	USFS	NESL	MEXFED	SGCN	NPL	GRANK	S RANK
Pima	PLANT	Passiflora arizonica	Arizona Passionflower	PDPAS01073			S					G5T3T5	S2
Pima	PLANT	Pectis imberbis	Beardless Chinch Weed	PDAST6W0A0	SC		S					G3	S1
Pima	PLANT	Peniocereus greggii var. transmontanus	Desert Night-blooming Cereus	PDCAC0V012					PR		SR	G3G4T3T4	S3S4
Pima	PLANT	Peniocereus striatus	Dahlia Rooted Cereus	PDCAC0V020							SR	G4	S1
Pima	PLANT	Pennellia tricornuta	Chiricahua Rock Cress	PDBRA06200			S					G1	S1S2
Pima	PLANT	Penstemon discolor	Catalina Beardtongue	PDSOR1L210			S				HS	G2	S2
Pima	PLANT	Perityle ajacensis	Ajo Rock Daisy	PDAST700Y0			S				SR	G1	S1
Pima	PLANT	Physalis latiphysa	Broadleaf Groundcherry	PDSOL0S0H0			S					G1	S1
Pima	PLANT	Platanthera limosa	Thurber's Bog Orchid	PMORC1Y0G0			S				SR	G4	S4
Pima	PLANT	Potentilla albiflora	White-flowered Cinquefoil	PDROS1B010			S					G1G2	S1S2
Pima	PLANT	Pseudobutillon thurberi	Thurber Indian Mallow	PDMAL020P0			S				SR	G2?	SH
Pima	PLANT	Psilotum nudum	Whisk Fern	PPPSI01020			S				HS	G5	S1
Pima	PLANT	Samolus vagans	Chiricahua Mountain Brookweed	PDPRI09040			S					GUQ	S2
Pima	PLANT	Schiedeella arizonica	Fallen Ladies'-tresses	PMORC67020			S				SR	GNR	S4
Pima	PLANT	Sisyrinchium cernuum	Nodding Blue-eyed Grass	PMIRI0D0B0			S					G5	S2
Pima	PLANT	Stenocereus thurberi	Organ Pipe Cactus	PDCAC10020			S				SR	G5	S4
Pima	PLANT	Stevia lemmonii	Lemmon's Stevia	PDAST8V010			S					G3G4	S2
Pima	PLANT	Thelypteris puberula var. sonorensis	Aravaipa Woodfern	PPTHE05192		S	S					G5T3	S2
Pima	PLANT	Tregia lacinhiata	Sonoran Noseburn	PDEUP1D060			S					G3G4	S3?
Pima	PLANT	Triteleopsis palmeri	Blue Sand Lily	PMLIL22010		S					SR	G3	S1
Pima	PLANT	Tumamoca macdougallii	Tumamoc Globeberry	PDCUC0S010		S	S				SR	G4	S3
Pima	PLANT	Vauquelinia californica ssp. sonorensis	Arizona Sonoran Rosewood	PDROS1R024		S						G4T1	S1S2
Pima	PLANT	Viola umbaticola	Shade Violet	PDVIO042E0			S					G3G4	S2?
Pima	REPTILE	Aspidoscelis arizonae	Arizona Striped Whiptail	ARACJ02071		S				1B		G2	S1S2
Pima	REPTILE	Aspidoscelis stictogramma	Giant Spotted Whiptail	ARACJ02011	SC		S			1B		G4	S2
Pima	REPTILE	Aspidoscelis xanthonota	Red-backed Whiptail	ARACJ02012	SC		S			1B		G2	S2
Pima	REPTILE	Chionactis occipitalis klauberi	Tucson Shovel-nosed Snake	ARADB05012	SC					1A		G5T3Q	S3
Pima	REPTILE	Crotalus lepidus klauberi	Banded Rock Rattlesnake	ARADE02051			S		PR	1A		G5T5	S3
Pima	REPTILE	Gopherus morafkai	Sonoran Desert Tortoise	ARAAF01013	CCA				A	1A		G4	S4
Pima	REPTILE	Heloderma suspectum suspectum	Reitulate Gila Monster	ARACE01012					A	1A		G4T4	S4
Pima	REPTILE	Kinostemon sonorensis longifemorale	Sonoyta Mud Turtle	ARAAE01041	C*				P	1A		G4T1	S1
Pima	REPTILE	Lichanura trivirgata	Rosy Boa	ARADA01020	SC		S		A	1B		G4G5	S1S2
Pima	REPTILE	Oxybelis aeneus	Brown Vinesnake	ARADB24010			S			1B		G5	S1
Pima	REPTILE	Plestiodon callicephalus	Mountain Skink	ARACH01030			S			G4G5		G4G5	S2
Pima	REPTILE	Sceloporus slevini	Slevin's Bunchgrass Lizard	ARACF14180		S	S			1B		G4	S2
Pima	REPTILE	Scincoides triaspis intermedia	Northern Green Ratsnake	ARADB44011			S			1B		G5T4	S3
Pima	REPTILE	Terrapene ornata luteola	Desert Box Turtle	ARAAD08021		S	S		PR	1A		G5T4	S2S3
Pima	REPTILE	Thamnophis eques megalops	Northern Mexican Gartersnake	ARADB36061	LT		S		A	1A		G4T3	S1
Pima	REPTILE	Uma rufopunctata	Yuman Desert Fringe-toed Lizard	ARACF15040	SC		S		P	1B		G3	S2

APPENDIX G
AIR QUALITY CALCULATIONS



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CALCULATION SHEET-COMBUSTION EMISSIONS-CONSTRUCTION

Assumptions for Combustion Emissions						
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs	
Water Truck	2	300	8	240	1,152,000	
Diesel Road Compactors	1	100	8	180	144,000	
Diesel Dump Truck	2	300	8	180	864,000	
Diesel Excavator	1	300	8	180	432,000	
Diesel Hole Trenchers	1	175	8	180	252,000	
Diesel Bore/Drill Rigs	2	300	8	180	864,000	
Diesel Cement & Mortar Mixers	2	300	8	180	864,000	
Diesel Cranes	1	175	8	180	252,000	
Diesel Graders	1	300	8	180	432,000	
Diesel Tractors/Loaders/Backhoes	2	100	8	180	288,000	
Diesel Bulldozers	2	300	8	180	864,000	
Diesel Front-End Loaders	2	300	8	180	864,000	
Diesel Forklifts	2	100	8	180	288,000	
Diesel Generator Set	3	40	8	180	172,800	

Type of Construction Equipment	Emission Factors ¹						
	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO ₂ g/hp-hr	CO ₂ g/hp-hr
Water Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Road Compactors	0.370	1.480	4.900	0.340	0.330	0.740	536.200
Diesel Dump Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Diesel Excavator	0.340	1.300	4.600	0.320	0.310	0.740	536.300
Diesel Trenchers	0.510	2.440	5.810	0.460	0.440	0.740	535.800
Diesel Bore/Drill Rigs	0.600	2.290	7.150	0.500	0.490	0.730	529.700
Diesel Cement & Mortar Mixers	0.610	2.320	7.280	0.480	0.470	0.730	529.700
Diesel Cranes	0.440	1.300	5.720	0.340	0.330	0.730	530.200
Diesel Graders	0.350	1.360	4.730	0.330	0.320	0.740	536.300
Diesel Tractors/Loaders/Backhoes	1.850	8.210	7.220	1.370	1.330	0.950	691.100
Diesel Bulldozers	0.360	1.380	4.760	0.330	0.320	0.740	536.300
Diesel Front-end Loaders	0.380	1.550	5.000	0.350	0.340	0.740	536.200
Diesel Forklifts	1.980	7.760	8.560	1.390	1.350	0.950	690.800
Diesel Generator Set	1.210	3.760	5.970	0.730	0.710	0.810	587.300

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS-
DELIVERY MATERIALS AND COMMUTING DURING CONSTRUCTION ACTIVITIES

Assumptions for Combustion Emissions					
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs
Propane Generator Set Back-up	7	25	4	24	16800
Propane Generator Set-Primary	10	25	8	365	730000

Emission Factors ⁱ							
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO ₂ g/hp-hr	CO ₂ g/hp-hr
Propane Generator Set Back-up	2.03	31.91	9.93	0.06	0.06	0.01	653.9
Propane Generator Set-Primary	2.03	31.91	9.93	0.06	0.06	0.01	653.9

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO ₂ tons/yr	CO ₂ tons/yr
Propane Generator Set Back-up	0.04	0.59	0.18	0.00	0.00	0.00	12.11
Propane Generator Set-Primary	1.64	25.67	7.99	0.05	0.05	0.01	526.00
Total Emissions	1.67	26.27	8.17	0.05	0.05	0.01	538.11

Conversion factors	
Grams to tons	1.102E-06

ⁱ Emission factors (EF) were generated using USEPA's preferred model for nonroad sources, the NONROAD2008 model. Emissions were modeled for the 2007 calendar year. The VOC EFs includes exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2008 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2008 model is based on the population in U.S. for the 2007 calendar year.

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS-
ONGOING OPERATIONS

MOVES 2010a						
Source	Fuel type	Number of vehicles	Miles traveled per day	Days of travel per year	Miles traveled per year	
Passenger cars	Gasoline	2	60	180	21,600	
Passenger truck	Gasoline	2	60	180	21,600	
Light commercial truck	Diesel	1	60	180	10,800	
Short-haul truck	Diesel	1	60	180	10,800	
Long-haul truck	Diesel	1	60	180	10,800	

Emission Factors (MOVES 2010a Emission Rates) ^j							
Source	VOC (g/mile)	CO (g/mile)	NOx (g/mile)	PM-10 (g/mile)	PM-2.5 (g/mile)	SO ₂ (g/mile)	CO ₂ and CO ₂ Equivalents (g/mile)
Passenger cars	8.497	2.892	0.576	0.019	0.018	0.005	320
Passenger truck	3.645	5.449	1.168	0.027	0.025	0.007	439
Light commercial	4.460	2.158	2.986	0.164	0.190	0.005	609
Short-haul truck	2.438	2.273	6.095	0.270	0.313	0.007	929
Long-haul truck	2.519	3.610	14.776	0.625	0.726	0.016	2,020

Total Emission for On-Road Commuter Activities (tons/year)							
Source	VOC	CO	NOx	PM-10	PM-2.5	SO ₂	CO ₂ and CO ₂ Equivalents
Passenger cars	0.20	0.07	0.01	0.00	0.00	0.00	8
Passenger truck	0.09	0.13	0.03	0.00	0.00	0.00	10
Light commercial truck	0.05	0.03	0.04	0.00	0.00	0.00	7
Short-haul truck	0.03	0.03	0.07	0.00	0.00	0.00	11
Long-haul truck	0.03	0.04	0.18	0.01	0.01	0.00	24
Total	0.40	0.29	0.33	0.01	0.01	0.00	60

Key:
Short-haul trucks category includes trucks such as dump trucks and cement trucks.
Long-haul trucks category includes trucks such as semi-trailers (18-wheelers).

MOVES2010a MODEL ON-ROAD TRANSPORTATION AIR EMISSIONS-
ONGOING OPERATIONS

ⁱ Emission factors were generated by the USEPA preferred model MOVES2010a. MOVES simulates daily motor vehicle operations and produces emission rates. MOVES emission rates include sources from engine combustion, tire wear, brake wear, evaporative fuel permeation, vapor venting and leaking (running and parking), and crankcase loss. Emission rates are daily averages for each of the criteria pollutants. The averages are from a combination of vehicle operations such as stop and go, highway travel, acceleration at on-ramps, parking, start-up, extended idle, etc.

CALCULATION SHEET-COMBUSTION EMISSIONS-CONSTRUCTION

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO ₂ tons/yr	CO ₂ tons/yr
Water Truck	0.559	2.628	6.970	0.520	0.508	0.939	680.454
Diesel Road Paver	0.059	0.235	0.778	0.054	0.052	0.117	85.089
Diesel Dump Truck	0.419	1.971	5.227	0.390	0.381	0.705	510.341
Diesel Excavator	0.162	0.619	2.190	0.152	0.148	0.352	255.313
Diesel Hole Cleaners\Trenchers	0.142	0.678	1.613	0.128	0.122	0.206	148.794
Diesel Bore/Drill Rigs	0.571	2.180	6.808	0.476	0.467	0.695	504.342
Diesel Cement & Mortar Mixers	0.581	2.209	6.931	0.457	0.448	0.695	504.342
Diesel Cranes	0.122	0.361	1.588	0.094	0.092	0.203	147.239
Diesel Graders	0.167	0.647	2.252	0.157	0.152	0.352	255.313
Diesel Tractors/Loaders/Backhoes	0.587	2.606	2.291	0.435	0.422	0.302	219.339
Diesel Bulldozers	0.343	1.314	4.532	0.314	0.305	0.705	510.626
Diesel Front-end Loaders	0.362	1.476	4.761	0.333	0.324	0.705	510.531
Diesel Forklift	0.628	2.463	2.717	0.441	0.428	0.302	219.243
Diesel Generator Set	0.230	0.716	1.137	0.139	0.135	0.154	111.837
Total Emissions	4.931	20.102	49.795	4.092	3.983	6.431	4662.803

Conversion factors	
Grams to tons	1.102E-06

ⁱ Emission factors (EF) were generated using USEPA's preferred model for nonroad sources, the NONROAD2008 model. Emissions were modeled for the 2007 calendar year. The VOC EFs include exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2008 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2008 model is based on the population in U.S. for the 2007 calendar year.

CALCULATION SHEET-FUGITIVE DUST-CONSTRUCTION

Assumptions for Combustion Emissions

Construction Fugitive Dust Emission Factors Emission Factor	Units	Source
General Construction Activities	0.19 ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006
New Road Construction	0.42 ton PM-10/acre-month	MRI 1996; EPA 2001; EPA 2006

PM-2.5 Emissions

PM-2.5 Multiplier	0.10	10% of PM-10 emissions assumed to be PM-2.5)	EPA 2001; EPA 2006
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Control Efficiency	0.50	(assume 50% control efficiency for PM-10 and PM-2.5 emissions)	EPA 2001; EPA 2006
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Project Assumptions

Construction Area (0.19 ton PM-10/acre-month)

Duration of Soil Disturbance in	6	Months	0.000022957	acres per foot
Length	10	Miles	5280	feet per mile
Length (converted)	52800	Feet		
Width	70	feet		
Area	84.85	acres		

Staging Areas

Duration of Construction Project	6	months		
Length		miles		
Length (converted)		Feet		
Width		Feet		
Area	2.00	acres		

* Assume that construction activities during road modification are limited to 10 miles area during any given construction day.

PM-10 uncontrolled	Project Emissions (tons/year)		
	PM-10 controlled	PM-2.5 uncontrolled	PM-2.5 controlled
Construction Area (0.19 ton PM-10/a)	96.73	48.36	9.67
Staging Areas	0.38	0.19	0.04
Total	97.11	48.55	9.71

Assumptions for Fugitive Emissions

General Construction Activities Emission Factor **.19 ton PM-10/acre-month** Source: MRI 1996; EPA 2001; EPA 2006

The area-based emission factor for construction activities is based on a study completed by the Midwest Research Institute (MRI) Improvement of Specific Emission Factors (BACM Project No. 1), March 29, 1996. The MRI study evaluated seven construction projects in Nevada and California (Las Vegas, Coachella Valley, South Coast Air Basin, and the San Joaquin Valley). The study determined an average emission factor of 0.11 ton PM-10/acre-month for sites without large-scale cut/fill operations. A worst-case emission factor of 0.42 ton PM-10/acre-month was calculated for sites with active large-scale earth moving operations. The monthly emission factors are based on 168 work-hours per month (MRI 1996). A subsequent MRI Report in 1999, Estimating Particulate Matter Emissions from Construction Operations, calculated the 0.19 ton PM-10/acre-month emission factor by applying 25% of the large-scale earthmoving emission factor (0.42 ton PM-10/acre-month) and 75% of the average emission factor (0.11 ton PM-10/acre-month).

The 0.19 ton PM-10/acre-month emission factor is referenced by the EPA for non-residential construction activities in recent procedures documents for the National Emission Inventory (EPA 2001; EPA 2006). The 0.19 ton PM-10/acre-month emission factor represents a refinement of EPA's original AP-42 area-based total suspended particle (TSP) emission factor in Section 13.2.3 Heavy Construction Operations. In addition to the EPA, this methodology is also supported by the South Coast Air Quality Management District and the Western Regional Air Partnership (WRAP) which is funded by the EPA and is administered jointly by the Western Governor's Association and the National Tribal Environmental Council. The emission factor is assumed to encompass a variety of non-residential construction activities including building construction (commercial, industrial, institutional, governmental), public works, and travel on unpaved roads. The EPA National Emission Inventory documentation assumes that the emission factors are uncontrolled and recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas.

New Road Construction Emission Factor

0.42 ton PM-10/acre-month Source: MRI 1996; EPA 2001; EPA 2006

The emission factor for new road construction is based on the worst-case conditions emission factor from the MRI 1996 study described above (0.42 tons PM-10/acre-month). It is assumed that road construction involves extensive earthmoving and heavy construction vehicle travel

resulting in emissions that are higher than other general construction projects. The 0.42 ton PM-10/acre-month emission factor for road construction is referenced in recent procedures documents for the EPA National Emission Inventory (EPA 2001; EPA 2006).

PM-2.5 Multiplier

0.10

PM-2.5 emissions are estimated by applying a particle size multiplier of 0.10 to PM-10 emissions. This methodology is consistent with the procedures documents for the National Emission Inventory (EPA 2006).

Control Efficiency for PM-10 and PM-2.5

0.50

The EPA National Emission Inventory documentation recommends a control efficiency of 50% for PM-10 and PM-2.5 in PM nonattainment areas. Wetting controls will be applied during project construction (EPA 2006).

References:

EPA 2001. *Procedures Document for National Emissions Inventory, Criteria Air Pollutants, 1985-1999*. EPA-454/R-01-006. Office of Air Quality Planning and Standards, United States Environmental Protection Agency. March 2001.

EPA 2006. *Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants*. Prepared for: Emissions Inventory and Analysis Group (C339-02) Air Quality Assessment Division Office of Air Quality Planning and Standards, United States Environmental Protection Agency. July 2006.

MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1)*. Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996

Generator Emissions

Assumptions for Combustion Emissions						
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs	
Propane Generator Set Back-up	7	25	4	24	16800	
Propane Generator Set-Primary	10	25	8	365	730000	

Emission Factors ¹						
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO ₂ g/hp-hr
Propane Generator Set Back-up	2.03	31.91	9.93	0.06	0.06	0.01
Propane Generator Set-Primary	2.03	31.91	9.93	0.06	0.06	0.01

Emission Calculations						
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO ₂ tons/yr
Propane Generator Set Back-up	0.04	0.59	0.18	0.00	0.00	0.00
Propane Generator Set-Primary	1.64	25.67	7.99	0.05	0.05	0.01
Total Emissions	1.67	26.27	8.17	0.05	0.05	0.01

Conversion factors	
Grams to tons	1.102E-06

¹ Emission factors (EF) were generated using USEPA's preferred model for nonroad sources, the NONROAD2008 model. Emissions were modeled for the 2007 calendar year. The VOC EFs includes exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2008 model are diurnal, hoisook, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2008 model is based on the population in U.S. for the 2007 calendar year.

CALCULATION SHEET-SUMMARY OF EMISSIONS

Summary of Emissions (tons/year) ⁱ										
Emission Source	VOC	CO	NOx	PM-10	PM-2.5	SO2	CO2	CO2 Equivalents	Total CO2	
Combustion Emissions	4.93	20.10	49.79	4.09	3.98	6.43	4662.80	15,610	20,272	
Construction Site-Fugitive PM-10	NA	NA	NA	48.55	4.86	NA	NA	NA	NA	NA
Construction Workers Commuter & Trucking	6.18	4.31	1.75	0.06	0.07	0.01	NA	502	502	
Total Emissions-CONSTRUCTION	11.11	24.41	51.55	52.71	8.91	6.44	4663	16,112	20,775	
Operational Emissions	0.40	0.29	0.33	0.01	0.01	0.00	NA	60	60	
Generators	1.67	26.27	8.17	0.05	0.05	0.01	538.11	2,583	3,121	
Total Operational Emissions	2.08	26.56	8.50	0.06	0.06	0.01	538	2,643	3,181	
<i>De minimis</i> Threshold (1)	100	100	100	70	100	100	NA	NA	25,000	

Carbon Equivalents	Conversion Factor
N2O or NOx	311
Methane or VOCs	25

Source: EPA 2010 Reference, Tables and Conversions, Inventory of U.S. Greenhouse Gas Emissions and Sinks; <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>

ⁱ Pima County is a moderate non-attainment area for PM-10 area for CO (USEPA 2013b)