DRAFT ENVIRONMENTAL ASSESSMENT

PROPOSED EAST HUGHES ACCESS ROAD RELOCATION PROJECT

Tucson International Airport, Tucson, Pima County, Arizona

Prepared for:

TUCSON AIRPORT AUTHORITY

and

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

SWCA Environmental Consultants
Tucson, Arizona

November 2014

This Environmental Assessment becomes a Federal document when evaluated, signed and dated by the Responsible FAA Official.

_____ _____

Responsible FAA Official Date

GENERAL INFORMATION ABOUT THIS DOCUMENT

WHAT'S IN THIS DOCUMENT? This document contains a Draft Environmental Assessment (EA) for the proposed East Hughes Access Road Relocation Project by Pima County, which will require the sale of land at Tucson International Airport (TUS) for use of an approximately 3-mile segment of the new road. The proposed sale of land will require the Tucson Airport Authority (TAA) to request approval from the Federal Aviation Administration (FAA). The Draft EA evaluates the environmental effects for the entire approximately 3.9-mile road alignment, although only an approximately 3-mile segment is the subject to TAA action and FAA approval. This document discloses the analysis and findings of the potential impacts of the Proposed Action, the No Action, and other reasonable alternatives.

BACKGROUND. The proposed project to realign East Hughes Access Road supports local land use plans and regional growth objectives by improving access for the development of aerospace and defense industry business, and to resolve conflicts between road operations and adjacent land uses.

WHAT SHOULD YOU DO? Read this Draft EA to understand the actions that Pima County, TAA, and FAA intend to take on this proposed project. Copies of the document are available for review at the Pima County's Joel D. Valdez Main Library, the administrative offices of Tucson International Airport, at the Pima County Department of Transportation, at the FAA's Phoenix Airports District Office, and at FAA's Western-Pacific Region office in Hawthorne, California. A list of these and other locations where the Draft EA is available is in Chapter 5.

If you have important information you believe has not been considered in this document or comments about the conclusions, you may submit your written comments by letter to the following address:

Eric Roudebush
Director of Environmental Services
Tucson Airport Authority
7005 South Plumer Avenue
Tucson, Arizona 85756

The cutoff date for comment submission is not later than 5:00 PM – Mountain Standard Time, December 30, 2014. Please allow enough time for mailing. We must receive your comments by the deadline, not simply postmarked by that date.

WHAT HAPPENS AFTER THIS? Under the National Environmental Policy Act, Pima County and TAA will prepare written responses to comments received on the adequacy of the information presented in the Draft EA and prepare a Final EA for transmittal to the FAA for approval. Following review of the Final EA, the FAA will either issue a Finding of No Significant Impact or decide to prepare a Federal Environmental Impact Statement.

Before including your name, address, telephone number, email, or other personal identifying information in your comment, be advised that your entire comment—including your personal identifying information—may be publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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1 Purpose and Need

1.1 Introduction

Pima County, Arizona, proposes to relocate a portion of East Hughes Access Road between the South Nogales Highway and South Alvernon Way about 2,500 feet to the south of its present location in order to remove the roadway and traveling public from designated safety zones used at U.S. Air Force (USAF) Plant 44. The relocated roadway would also permit the Tucson Airport Authority (TAA) to more easily develop land for revenue-generating purposes consistent with its currently approved Airport Layout Plan (ALP) for Tucson International Airport (TUS).

This Environmental Assessment (EA) has been prepared pursuant to the requirements of Section 102(2)(c) of the *National Environmental Policy Act of 1969* (NEPA), President's Council on Environmental Quality (CEQ) Regulations 40 Code of Federal Regulations (CFR) §§ 1500–1508, the implementing regulations for NEPA, and Section 509(b)(5) of the *Airport and Airway Improvement Act of 1982*, as amended. This EA has also been prepared in accordance with Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures* (U.S. Department of Transportation 2006b); and FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions* (U.S. Department of Transportation 2006a). This EA is intended to identify and consider potential environmental impacts related to the proposed East Hughes Access Road Relocation project at TUS (the Proposed Action). The FAA is the lead federal agency to ensure compliance with NEPA for airport development actions. FAA federal authority for the project approval extends only for the roadway portion on TAA property. However, since the roadway relocation is one continuous route, the entire roadway alignment is evaluated in this EA.

The TAA and the Pima County Department of Transportation (PCDOT) are planning to relocate the existing two-lane section of East Hughes Access Road immediately south of TUS along and south of the existing East Hughes Access Road between South Nogales Highway and South Alvernon Way (**Figures 1-1** and **1-2**). The proposed project area elevation ranges between 2,610 and 2,680 feet above mean sea level and is located in Sections 28 and 31–33, Township 15 South, Range 14 East, Gila and Salt River Baseline and Meridian, on the 1984 U.S. Geological Survey Tucson Southwest, Pima County, Arizona, 7.5-minute topographic series map. The proposed project is located within the city of Tucson and unincorporated Pima County on lands owned by Pima County, the TAA, the City of Tucson (COT), and the USAF (leased to Raytheon Missile Systems [Raytheon]). Adjacent lands are owned by Pima County, the TAA, the COT, and the USAF (**Figure 1-3**). To relocate the roadway, right-of-way (ROW) must be acquired from the TAA and the COT. The majority of the land needed for the proposed project (approximately 3.0 miles of the 3.9-mile length of the new roadway) is currently owned and operated by the TAA. The land sought from the TAA for acquisition by the PCDOT is federally obligated because it was acquired by the TAA using FAA Airport Improvement Program grants and is depicted on the FAA approved ALP.

This chapter provides a brief description of TUS; a description of the Proposed Action; a discussion of the purpose of and need for the Proposed Action; a description of the requested federal actions; a summary of applicable federal EA processes and procedures; and a description of the format of this EA.

1.2 Project Background

The TAA is responsible for managing the TUS, which is a commercial service airport that serves the Tucson metropolitan area, southern Arizona, and northern Sonora, Mexico. The primary objective of the TAA is the promotion and development of the most complete, modern, and efficient airport and air facilities to meet the needs of users and encourage economic growth in Tucson and southern Arizona.

Figure 1-1. Project location.

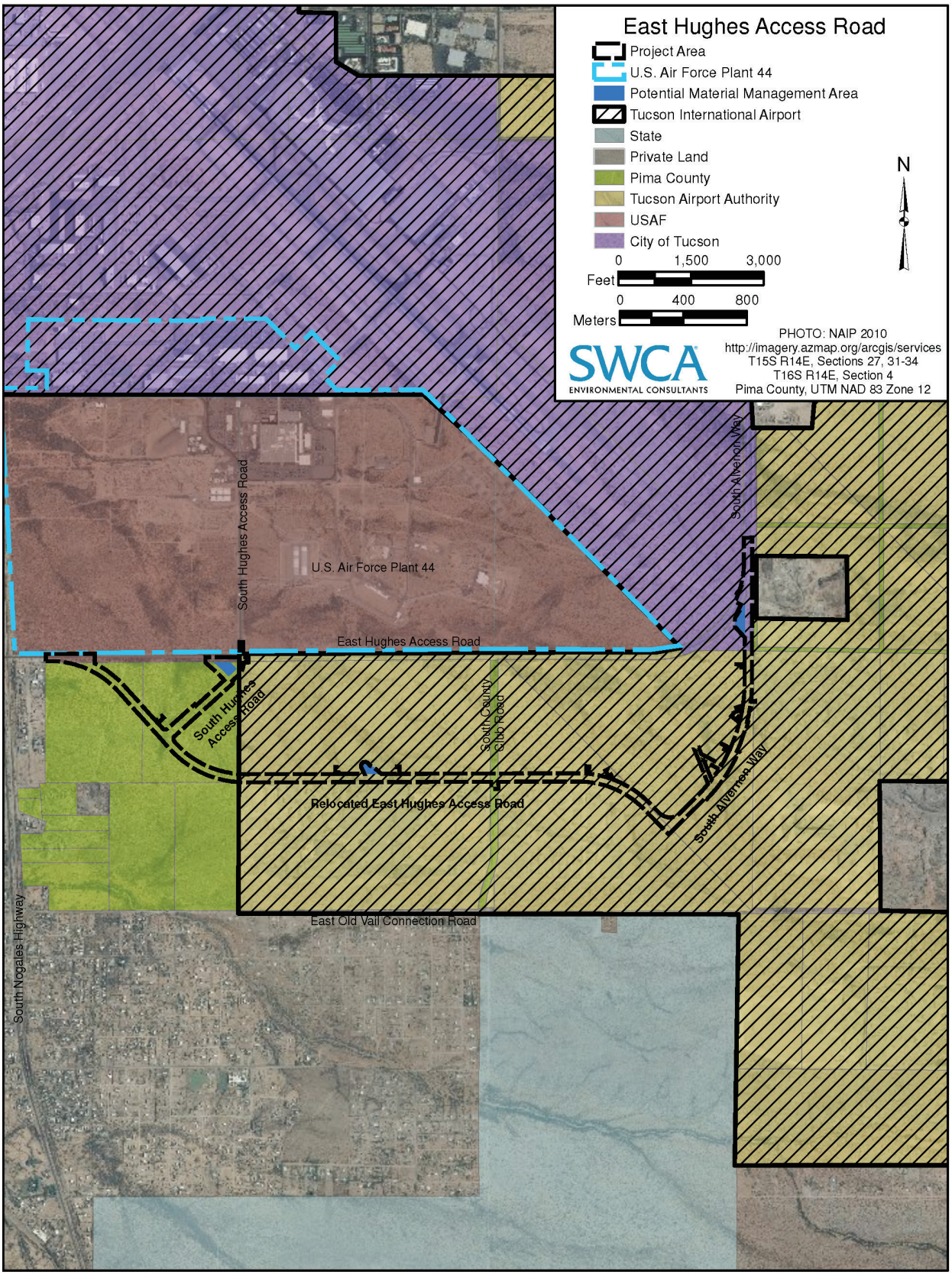

Figure 1-2. Land ownership/operation.

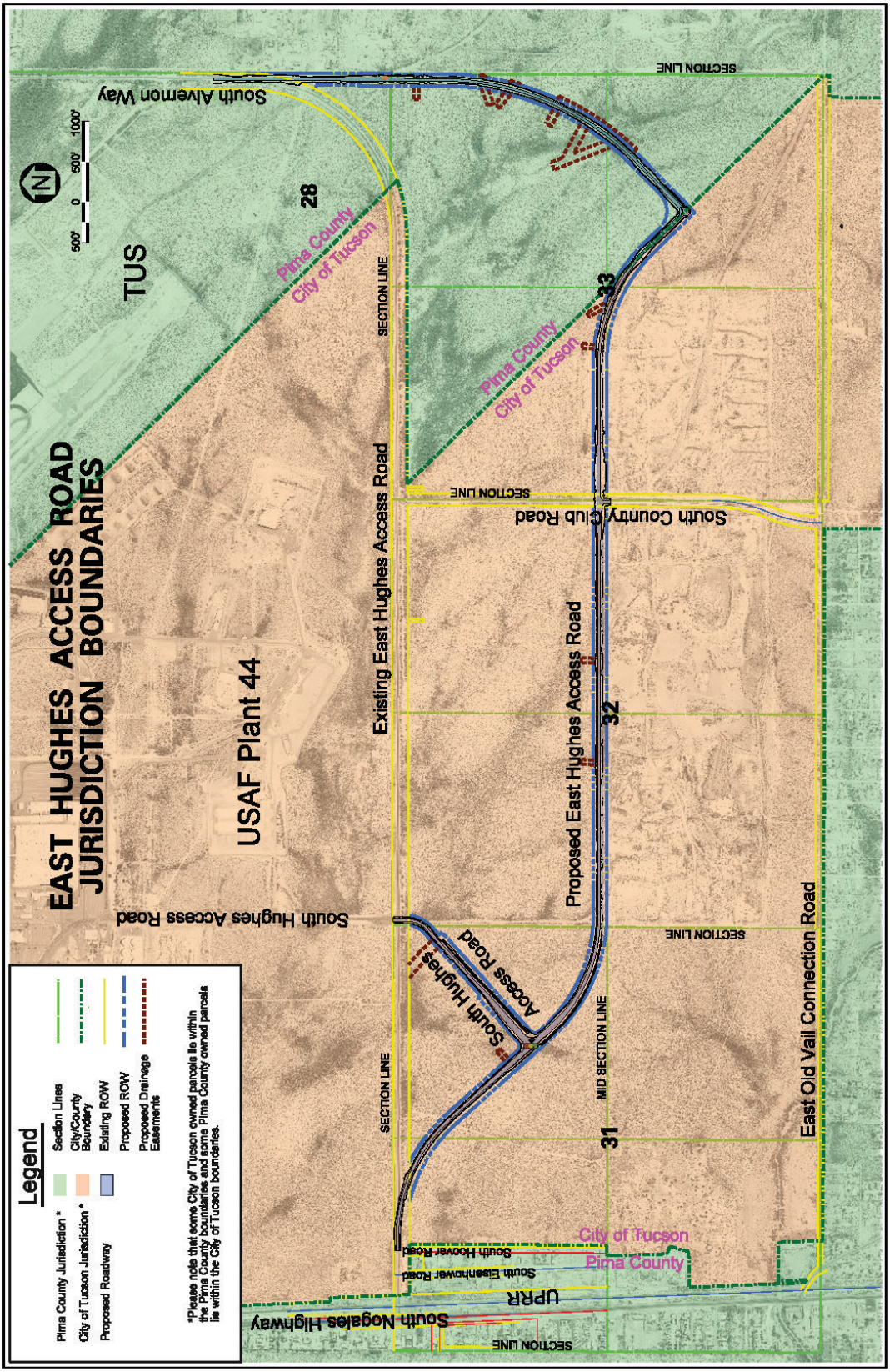

Figure 1-3. Land jurisdiction.

The TAA has a long-term lease with the COT for 8,343 acres of land to operate and manage the TUS. The TAA also owns land south of the TUS.

The airport serves 3.6 million passengers annually, with commercial flights from six airlines, and plays an important role for air cargo operations for regional and international trade in southern Arizona. The airport also supports the 162nd Wing of the Air National Guard, which conducts the largest training operation for the F-16 aircraft. The region south of the TUS has been identified through several statewide studies as a primary location for import distribution from Mexico, which is less than 60 miles to the south of the TUS. The proximity to two federal interstate highways, two rail lines, and access to air freight make this a primary industrial and logistics development location for the region.

East Hughes Access Road is a two lane road located south of TUS between South Alvernon Way and South Nogales Highway and provides access to existing South Hughes Access Road. The USAF indicates that facilities at USAF Plant 44 are operating on exemptions from the Secretary of the Air Force and the Department of Defense (DoD). The location and use of the existing East Hughes Access Road to various buildings on USAF Plant 44 do not meet the USAF's Inhabited Building Distance standards. The number of daily trips used on the existing East Hughes Access Road was one of the contributing factors to obtaining the exemptions from the Secretary of the Air Force for continued operation of Plant 44. Waivers granted by the USAF are reviewed and validated annually under *Air Force Manual* (*AFMAN*) *91-201*, *Explosives Safety Standards* (USAF 2011). The USAF encourages the elimination of waivers for operation whenever construction or reconstruction occurs.

To ensure that the East Hughes Access Road would be located outside the applicable USAF safety arc, Pima County proposes to relocate the East Hughes Access Road approximately 2,500 feet to the south along the east-west midsection line for Sections 31, 32, and 33 between the South Nogales Highway and South Alvernon Way. The USAF safety arc and the proposed location for East Hughes Access Road are shown in **Figure 1-4**. The Proposed Action would not change aircraft operations at the TUS. A detailed description of the Proposed Action is provided in below in **Section 1.3**.

Airport lands within and adjacent to the project area[1] are owned by the TAA, the COT, the USAF, and Pima County. The TUS resides on land that the TAA leases from the COT (see **Figure 1-2**). The majority of the land needed for the Proposed Action is owned by the TAA in accordance with the *2012 TUS Master Plan Update* (TAA 2013). To relocate the roadway, fee simple acquisition of ROW and drainage easements would be acquired at fair market value from the TAA and the COT. The land sought from the TAA for acquisition by PCDOT is federally obligated because it was acquired by the TAA using FAA Airport Improvement Program grants and is depicted on the FAA approved ALP. These airport lands were acquired for non-aeronautical purposes and would require an FAA release for the sale of the land. In addition, a small portion of the Proposed Action would occur on a Pima County roadway easement on lands owned by the TAA, the USAF, and the COT. Small portions of these easements would remain. **Figures 1-5** and **1-6** show the new roadway ROW and easement locations. All areas within the new roadway ROW may be disturbed during construction.

1.3 Description of the Proposed Action

To relocate East Hughes Access Road outside the USAF safety arc, the TAA and PCDOT propose to construct a new two-lane section of East Hughes Access Road approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor.

[1] Throughout this EA, the term "project area" refers to the approximately 106 acres representing the construction footprint (i.e., area of disturbance) and is discussed in more detail in **Chapter 2**.

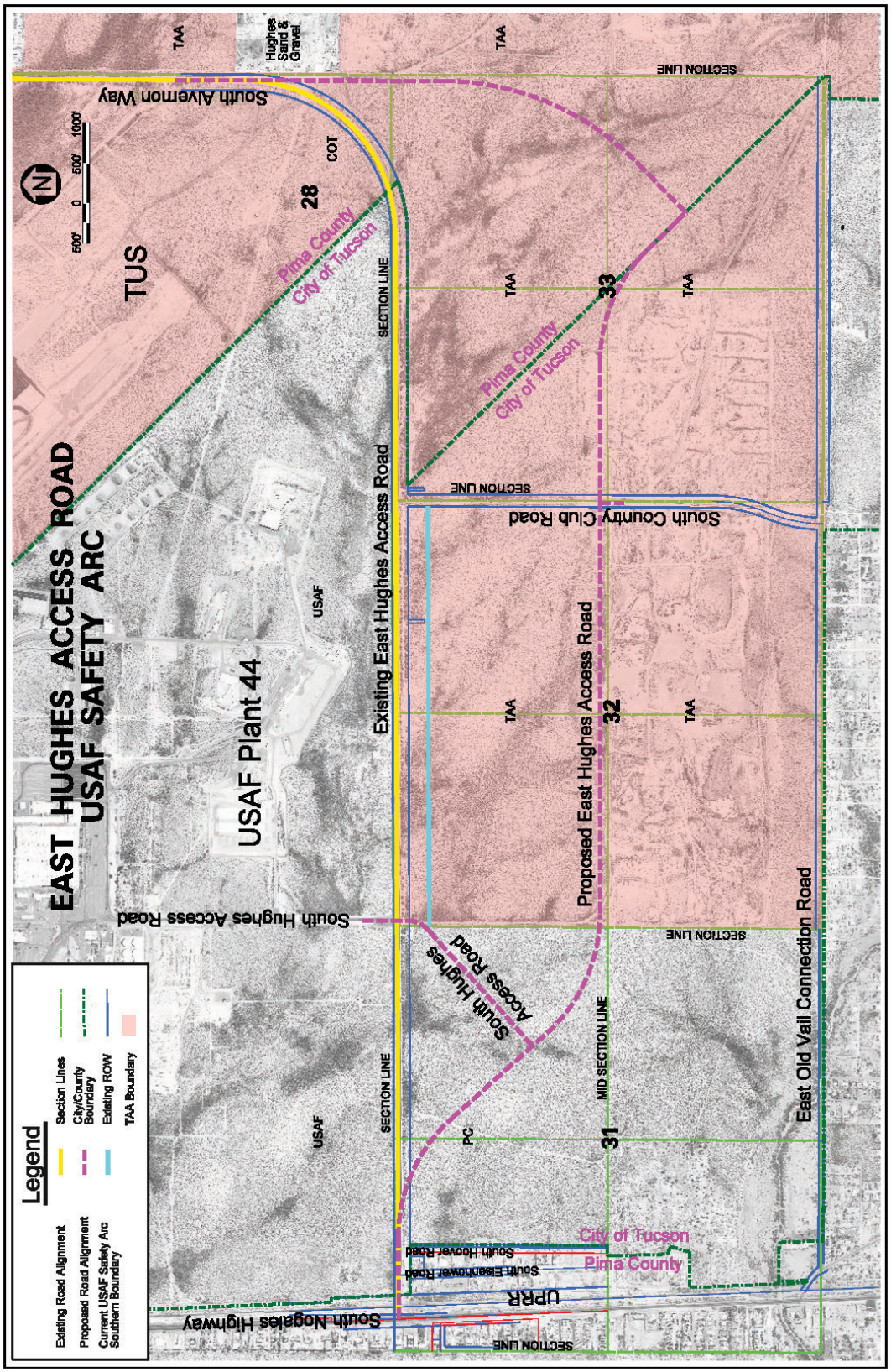

Figure 1-4. USAF Plant 44 safety arc.

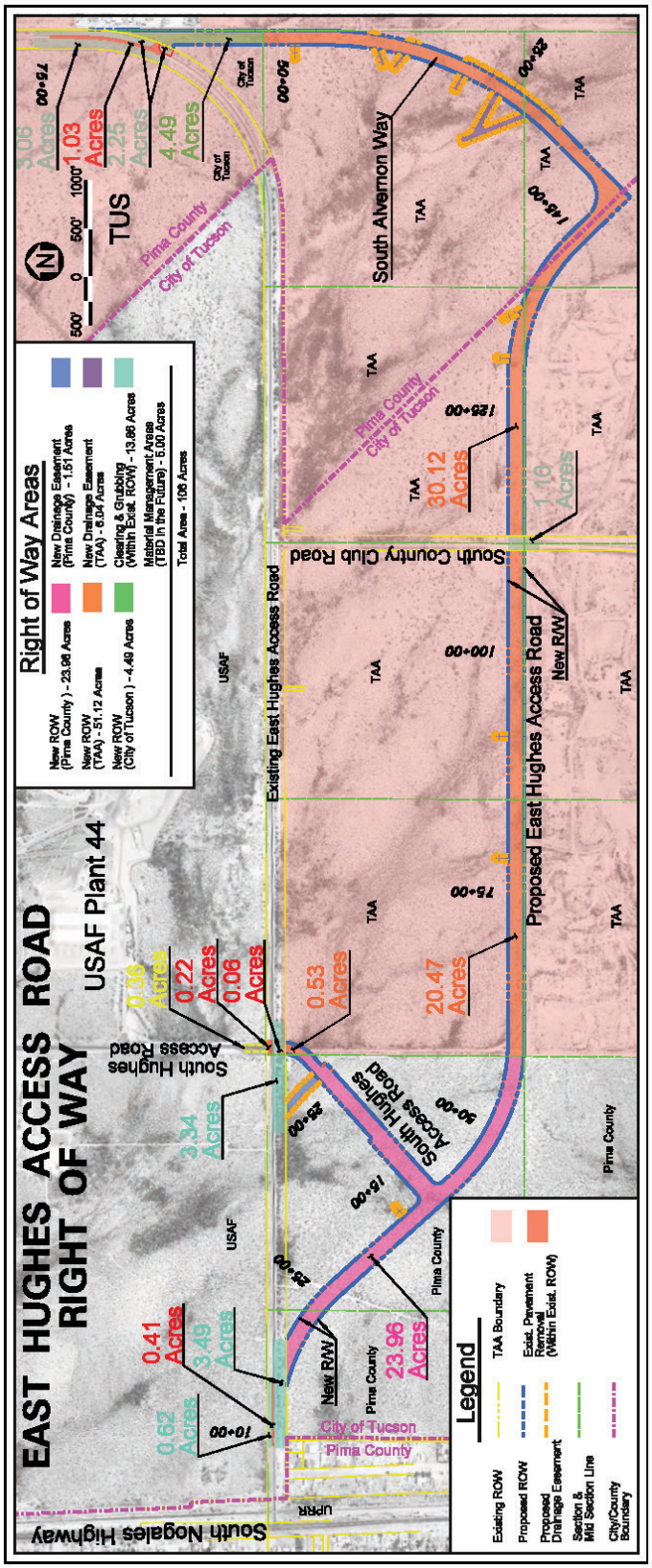

Figure 1-5. Locations where new ROW would be required.

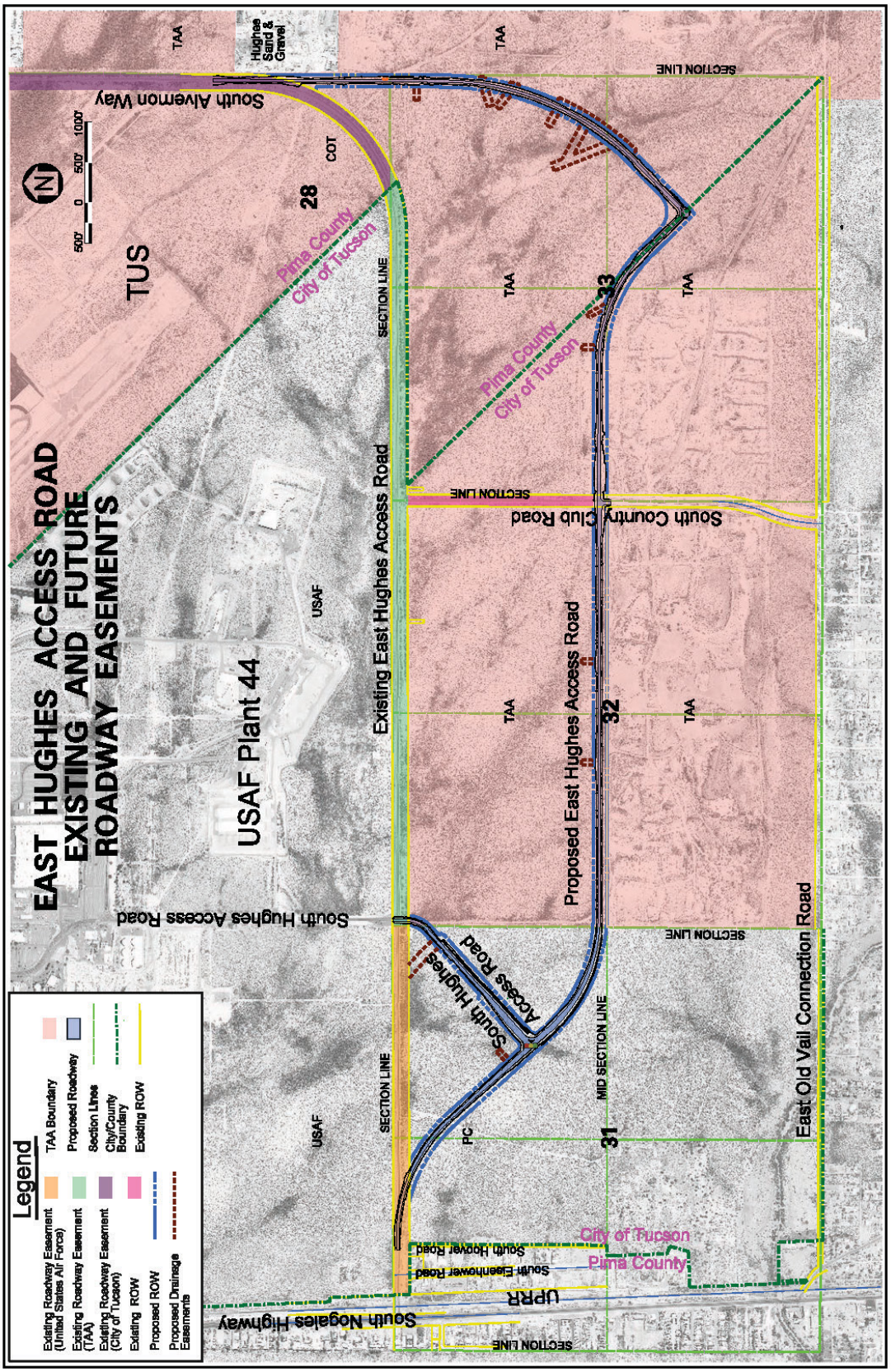

Figure 1-6. Existing and future roadway easements.

The Proposed Action is estimated to permanently impact 106 acres, of which 79.57 acres would be for new ROW acquisition, 7.55 acres for drainage easements, 4.93 acres for potential material management areas, and 13.75 acres for potential impacts within existing ROW consisting of pavement removal and clearing and grubbing areas. To improve clarity, the term "project area" is used when describing the 106-acre disturbance area where construction would be required, such as the new ROW, drainage easements, material management areas, areas where existing pavement will be removed, and areas for utility relocations, etc., under the Proposed Action (see bulleted list in **Section 2.6** for more details). The project would shift current traffic from the existing two-lane alignment to the new location with two lanes. Traffic volumes are not anticipated to increase on the relocated roadway, so replacing two lanes with two lanes has been deemed adequate to handle traffic volumes. The project would change the project area from undeveloped land to a two-lane roadway.

Lands within and adjacent to the project area are owned by the TAA, the COT, the USAF property leased to Raytheon, and Pima County. The TUS resides on land that TAA leases from the COT (see **Figure 1-2**), and the project area is within the city of Tucson and unincorporated Pima County (see **Figure 1-3**). Acquisition of ROW and drainage easements for land not currently owned by Pima County would be required from the TAA that is obligated under FAA grant assurances and from the COT. The existing alignment of East Hughes Access Road is located on a series of ROW easements or leases granted by the TAA, the USAF, and the COT. The road relocation would require PCDOT acquisition of approximately 23.96 acres of ROW from Pima County, 51.12 acres of ROW from the TAA, and 4.49 acres of ROW from the COT, for a total of 79.57 acres of fee simple ROW acquisition. In addition, approximately 7.55 acres of drainage easements would be required to construct the Proposed Action: 1.51 acres from Pima County and 6.04 acres from the TAA. **Figures 1-4** and **1-5** show the new roadway fee simple ROW acquisition and easement locations.

After East Hughes Access Road is relocated, portions of the existing road that are no longer needed would be abandoned or exchanged for like value, and the rights would be restored to original grantors (TAA, USAF, and COT). Land held by the COT is subject to the TAA master lease and would not be removed from the TUS ALP (2014). A small portion of the Proposed Action is within the existing Pima County roadway easement on lands owned by the USAF and the COT, and portions of these easements would remain.

The project's preliminary estimated cost is $12.7 million and would be completely funded by Pima County. This project is identified in the *Pima County Economic Development Plan, 2012 to 2014* (Pima County Board of Supervisors 2012). Project construction is anticipated to commence in spring 2015, and construction would last approximately 6 months. Project bidding and the project itself would be administered by the PCDOT.

1.4 Purpose of and Need for the Proposed Action

The CEQ regulations implementing NEPA require that an EA specify the underlying Purpose of and Need to which an agency is responding in proposing actions and alternatives (40 CFR 1502.13).

1.4.1 TAA's and PCDOT's Purpose and Need

According to the USAF's *AFMAN 91-201*, *Explosives Safety Standards*, "waivers are granted for a short period (5 years or less) pending cancellation or correction of the waived conditions" (USAF 2011:34). Therefore, waivers for complying with the USAF Plant 44 safety arc cannot go on indefinitely, and the relocation of Hughes Access Road is needed in order to comply with the safety arc and correct the waived conditions before the waivers expire. The TAA's and PCDOT's purpose of the project is to relocate the existing East Hughes Access Road to comply with the safety arc imposed by the USAF for Plant 44 adjacent to the road that is leased by Raytheon. The TAA's and PCDOT's need for the project is for East Hughes Access Road to comply with the USAF safety arc for the Plant 44 facilities leased by Raytheon.

1.4.2 FAA's Purpose and Need

The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States. The FAA must ensure that the Proposed Action does not impair the safety of aircraft and airport operations at the TUS. The Proposed Action would improve transportation access to and at TUS and would support the safe and efficient use of navigable airspace in the United States.

1.4.3 Requested FAA Actions

The requested FAA actions include the following:

- Unconditional approval of the portion of the Airport Layout Plan that depicts the land to sold to Pima County for the relocation of East Hughes Access Road.
- Approval of the Tucson Airport Authority's request for release of federal obligations on land owned by the Airport Authority for use by Pima County to relocate East Hughes Access Road.
- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular 150/5370-2F, *Operational Safety on Airports During Construction* (14 CFR Part 139 [49 United States Code (U.S.C.) § 44706]).
- Approval of the appropriate amendments to the Airport Certification Manual pursuant to 14 CFR Part 139.
- FAA determination of the Proposed Action's effects on the safe and efficient use of airspace pursuant to 14 CFR Part 77, *Objects Affecting Navigable Airspace*.

1.5 Preliminary East Hughes Access Road Relocation Schedule

Sale of the land and the subsequent construction of the Proposed Action is anticipated to begin in spring 2015, with a duration of 6 to 8 months, to be completed by December 31, 2015.

1.6 Document Organization

The contents of each section of the EA are summarized below:

- Chapter 1, Purpose and Need, provides a description of TUS and the Proposed Action, its purpose, and why it is needed.
- Chapter 2, Alternatives, provides an overview of the identification and screening of alternatives considered as part of the environmental evaluation process.
- Chapter 3, Affected Environment, describes existing environmental conditions within the project study areas.
- Chapter 4, Environmental Consequences and Mitigation Measures, discusses and compares the environmental impacts associated with the Proposed Action, the No Action Alternative, and mitigation options considered.
- Chapter 5, Coordination and Public Involvement, discusses the coordination and public involvement associated with the EA process. This section also presents a list of federal, state, and local agencies and other interested parties that have been involved in the EA coordination efforts.
- Chapter 6, List of Preparers.
- Chapter 7, List of Abbreviations and Acronyms.
- Chapter 8, References.

The appendices contain various reference materials, including technical information and records of coordination activities.

2 Alternatives

2.1 Introduction

This chapter summarizes the alternatives that were identified for meeting the project purpose and need discussed in **Chapter 1, Purpose and Need**. This chapter also summarizes the screening analysis used to identify a range of reasonable and prudent alternatives, and expands upon those that were subsequently selected for full evaluation in this EA. The information provided in this chapter includes the following:

- An overview of the structure of the alternatives analysis used for this EA;
- A description of the alternatives considered, including the Proposed Action Alternative and the No Action Alternative;
- A concise statement explaining why some alternatives considered have been eliminated from further study; and
- A listing of applicable laws, regulations, executive orders (EOs), and associated permits, licenses, and/or reviews.

2.1.1 Requirements of the National Environmental Policy Act

The CEQ regulations for implementing NEPA require that federal agencies perform the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives that were eliminated from detailed study, briefly discuss the reasons for their elimination;
- Devote substantial treatment to each alternative considered in detail, including the Proposed Action, so that reviewers may evaluate their comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency; and
- Include an analysis of a No Action Alternative to serve as a baseline point of comparison for the potential impacts of other alternatives.

The purpose of the proposed East Hughes Access Road Relocation Project is to relocate the existing East Hughes Access Road outside the safety arc imposed by the USAF for the Plant 44 facilities adjacent to the road that are leased by Raytheon. Reasonable alternatives that accomplish the stated purpose of and need for the project have been identified and evaluated in this EA to satisfy NEPA requirements.

2.2 Factors Affecting Alternatives Analysis

Prior to the development of specific alternatives, the TAA and PCDOT identified a number of factors that affect the siting of the relocation of East Hughes Access Road, such as compliance with the USAF safety arc, availability of land to relocate the roadway, and compliance with future land use plans and economic growth objectives.

2.2.1 Compliance with USAF Safety Arc for Facilities Leased to Raytheon

The USAF Plant 44 facilities leased to Raytheon currently require safety arc waivers issued by the DoD due to the proximity and traffic volume of the existing East Hughes Access Road. The general location of the overlap of the safety arc on the existing East Hughes Access Road is shown in **Figure 1-4**. The siting of the relocation of East Hughes Access Road outside the safety arc would be required to relieve USAF of the need to continuously issue safety arc waivers for these facilities and to meet the purpose of and need of this project. Locations that fall within the safety arc would be potential alignments to avoid.

2.2.2 Readily Available Land to Relocate the Roadway

The siting of the relocation of East Hughes Access Road would require readily available land that can be acquired by PCDOT so that the relocated roadway can be operational by December 31, 2015. To meet this deadline, the relocated roadway would need to be on land that is already owned by Pima County. If the land required for the realignment is not fully owned by Pima County, the non–Pima County owned land would need to be made available from the TAA and COT. Acquisition of private lands would not be pursued because of the additional costs and delay that would be required. All lands that would be considered for the siting of the relocation would need to have conditions that are conducive to the construction of a new road by the deadline. These conditions include being undeveloped land in order to avoid displacements and relocations, having general flat topography to minimize engineering and design efforts, and having the ability to tie in with the existing South Nogales Highway, South Alvernon Way, and East Hughes Access Road and maintain access to existing South Hughes Access Road.

2.2.3 Compliance with Future Land Use Goals and Economic Growth Objectives

The siting of the relocation of East Hughes Access Road would require the relocated road to comply with future land use goals and economic growth objectives for the area south of TUS. These goals and objectives are identified in the TAA's *2012 TUS Master Plan Update*, Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*, and the Pima County Board of Supervisors' *Pima County Economic Development Plan, 2012 to 2014*. In general, these documents identify the need for East Hughes Access Road to be relocated in order to encourage the development of aerospace, defense, and logistics industries on the parcels of land south of TUS. The relocated road would provide access to these parcels and would be required to be located in a manner that promotes optimal spatial configurations for the fullest and most orderly possible future development of the parcels by aerospace, defense, and logistics industries. Potential relocations to avoid would be alignments that do not provide adequate access to the parcels of land south of TUS or that create undesirable spatial configurations for future development of the parcels.

2.3 Overview of the Screening Process

Section 2.2, Factors Affecting Alternatives Analysis discusses the evaluation of alternatives with respect to meeting the need to comply with the USAF safety arc and provide access to the southern property of TUS for orderly airport and regional economic development. For the purpose of this alternatives analysis, the following three-step analysis (screening process) was considered:

Step 1: Does the proposed realignment of East Hughes Access Road comply with the USAF safety arc and FAA Airport Design Standards?

Step 2: Could the land be acquired by Pima County so the relocated roadway can be operational by December 31, 2015? Factors to consider in evaluation of this step include:

- Is the site already owned by Pima County?
- Is the site readily available for use?
- Are there substantial permitting issues anticipated at the site?

Step 3: Does the proposed alignment of East Hughes Access Road comply with future land use plans and economic growth objectives? Factors to consider in evaluation of this step include:

- Does the alternative comply with the future land use and economic growth objectives as identified in the *2012 TUS Master Plan Update*, Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*, and the *Pima County Economic Development Plan, 2012 to 2014?*
- Does the alternative improve access to adjacent parcels while not creating spatial constraints for future development?

This three-step screening process was progressive. For example, if an alternative did not meet the question asked in Step 1, it was not carried forward to Step 2. Alternatives that passed all three steps, along with the No Action Alternative, were then evaluated for their potential environmental effects in **Chapter Three, Affected Environment**, and **Chapter Four, Environmental Consequences and Mitigation Measures**, of this EA. **Figure 2-1** illustrates the screening Process used in this EA.

2.4 Evaluation of Alternatives

2.4.1 Alternative 1 – Proposed Action

Alternative 1 – Proposed Action would relocate East Hughes Access Road approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor. The alternative would shift current traffic from the existing two-lane alignment to the new location outside the USAF safety arc. Land for the relocation would be available from Pima County, the TAA, and COT, as described in **Section 1.3**. The alignment would traverse previously disturbed land (dirt road associated with adjacent inactive sand and gravel pit) and undeveloped land that does not have any significant topographical engineering or design constraints. No substantial permitting efforts would be anticipated for the alignment. The relocation would provide access to the parcels of land south of TUS in a manner that would provide optimal spatial configuration options for the full and orderly future development of the parcels by aerospace, defense, and logistics industries. Therefore, the relocation would support the land use and economic growth objectives identified in the *2012 TUS Master Plan Update*, Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*, and the *Pima County Economic Development Plan, 2012 to 2014*.

2.4.2 Alternative 2 – South Route

Consideration was given to Alternative 2 – South Route, which would relocate East Hughes Access Road to the south of its current alignment and outside the safety arc (see Alternative 2 – South Route in **Figure 2-2**). This alternative would pass screening process Step 1 by relocating the road outside the USAF safety arc. This alternative would also pass screening process Step 2 because lands would be available from Pima County, the TAA, and COT. However, Alternative 2 – South Route would not pass screening Step 3 to create desirable areas for future aerospace, defense, and logistic industries developments because it would bisect the parcels and not provide optimal spatial configurations for the full and orderly future development of the parcels. Ultimately, this option was not carried forward because it would not fully provide a road corridor that encourages the development of aerospace, defense, and logistics industries on TAA property.

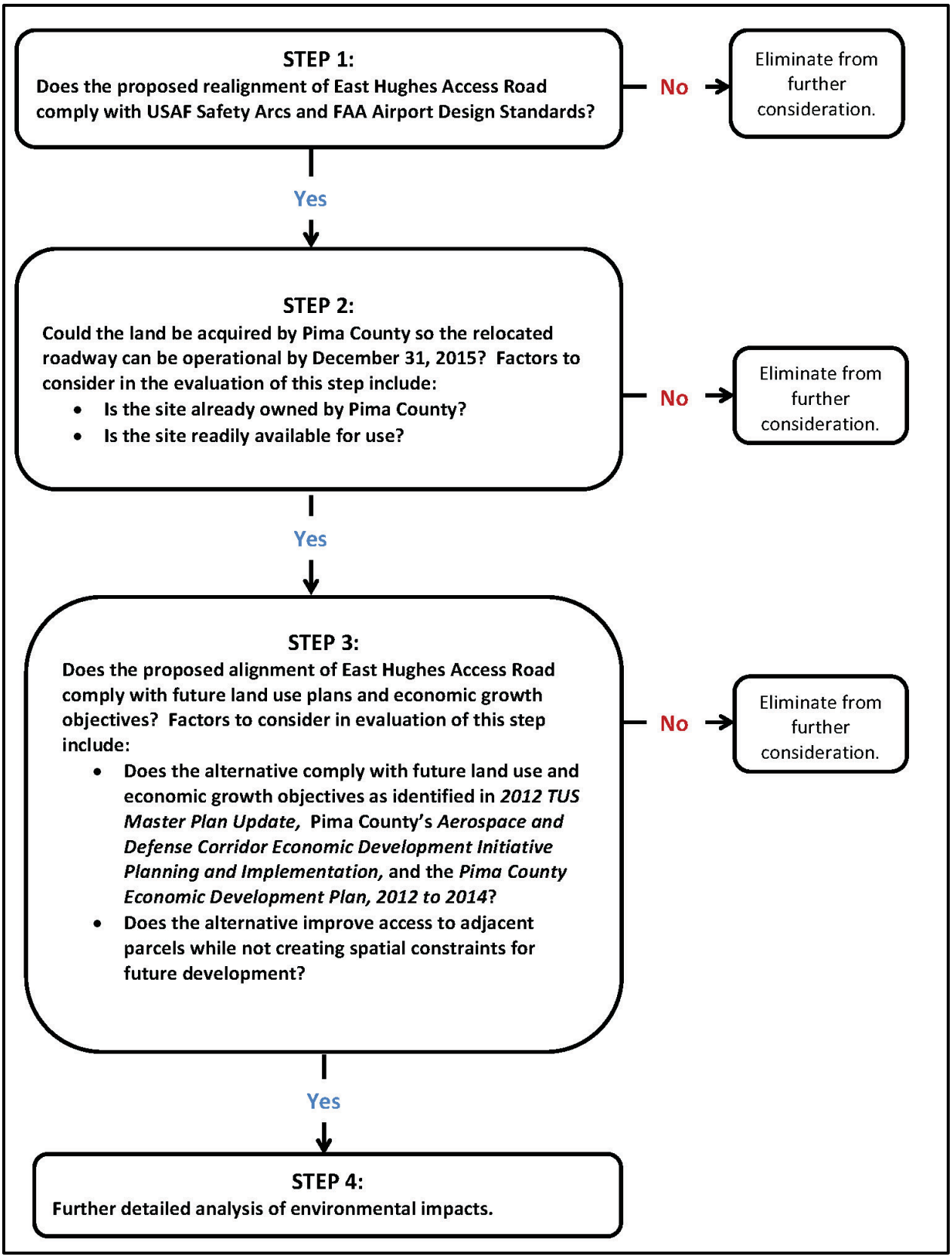

Figure 2-1. Alternatives screening process.

2.4.3 Alternative 3 – Pit Route

Consideration was given to Alternative 3 – Pit Route, which would relocate East Hughes Access Road farther south than the alignment of Alternative 1 – Proposed Action (see Alternative 3 – Pit Route in **Figure 2-2**). This relocation alternative would pass screening Step 1 by relocating the road outside the USAF safety arc. However, this alternative would not pass screening Step 2 because the route would require substantial design and construction efforts to address the topographical constraints created by the deep, retired, materials source mining pits and a closed, inert landfill. Ultimately, this alternative was not carried forward because the alignment would not go through readily available land with conditions that are conducive to designing and constructing a road by December 31, 2015.

2.4.4 Alternative 4 – Old Vail Route

Consideration was given to Alternative 4 – Old Vail Route, which would remove access to the existing East Hughes Access Road and use the existing East Old Vail Connection Road, which is approximately 1 mile south of East Hughes Access Road (see Alternative 4 – Old Vail Route in **Figure 2-2**). Alternative 4 – Old Vail Route would pass Step 1 of the screening process by removing East Hughes Access Road outside the USAF safety arc. East Old Vail Connection Road currently is a low-volume road that provides access to residential property. Additionally, East Old Vail Connection Road is primarily an at-grade dirt road with extensive drainage issues across and along the alignment that would have to be improved to provide an all-weather road. Preliminary estimates of the drainage improvements that would be required indicate that a substantial permitting issue would be possible due to extensive impacts to Waters of the United States. This alignment would also involve the improvement and extension of South Alvernon Way and South Country Club Road to East Old Vail Connection Road, which could result in increased construction costs and longer drive times to access USAF Plant 44. A new railroad crossing would be required to access South Nogales Highway, and this alignment would cross an existing Western Area Power Administration (Western) line in Section 32. Therefore, there could be additional design considerations, costs, and time required to obtain clearances from the Federal Railroad Administration and Western. Because of the potential permitting issues, design constraints, and time requirements, this alternative does not pass screening process Step 2.

2.4.5 Alternative 5 – Non-development Route - Close Existing East Hughes Access Road

Alternative 5 – Non-development Route would include the closure of existing East Hughes Access Road and require traffic to use other existing roads to access South Nogales Highway and South Hughes Access Road (see Alternative 5 – Non-development in **Figure 2-3**). Existing roads that would absorb the traffic volumes that occur on East Hughes Access Road include East Valencia Road and South Nogales Highway. This alternative would pass screening process Step 1 by closing the East Hughes Access Route to the public; therefore, safety arc waivers from the DoD would no longer be required for the USAF Plant 44 facilities. This alternative would also pass screening process Step 2 because no land acquisition would be required, and it would meet the December 31, 2015, deadline. However, Alternative 5 – Non-development Route would not meet future land use and economic growth objectives because the parcels south of TUS would no longer be accessible. Therefore, this alternative would not pass screening process Step 3.

2.4.6 Alternative 6 – No Action Alternative

The CEQ regulations at 40 CFR 1502.14(d) require the inclusion of a No Action Alternative in the analysis contained in the environmental document. Although the No Action Alternative would not meet the purpose of and need for the project, it serves as a baseline point of comparison for the potential impacts of the Proposed Action. **Figure 2-2** shows the existing alignment of East Hughes Access Road, along with the Proposed Action and alternatives considered but dismissed.

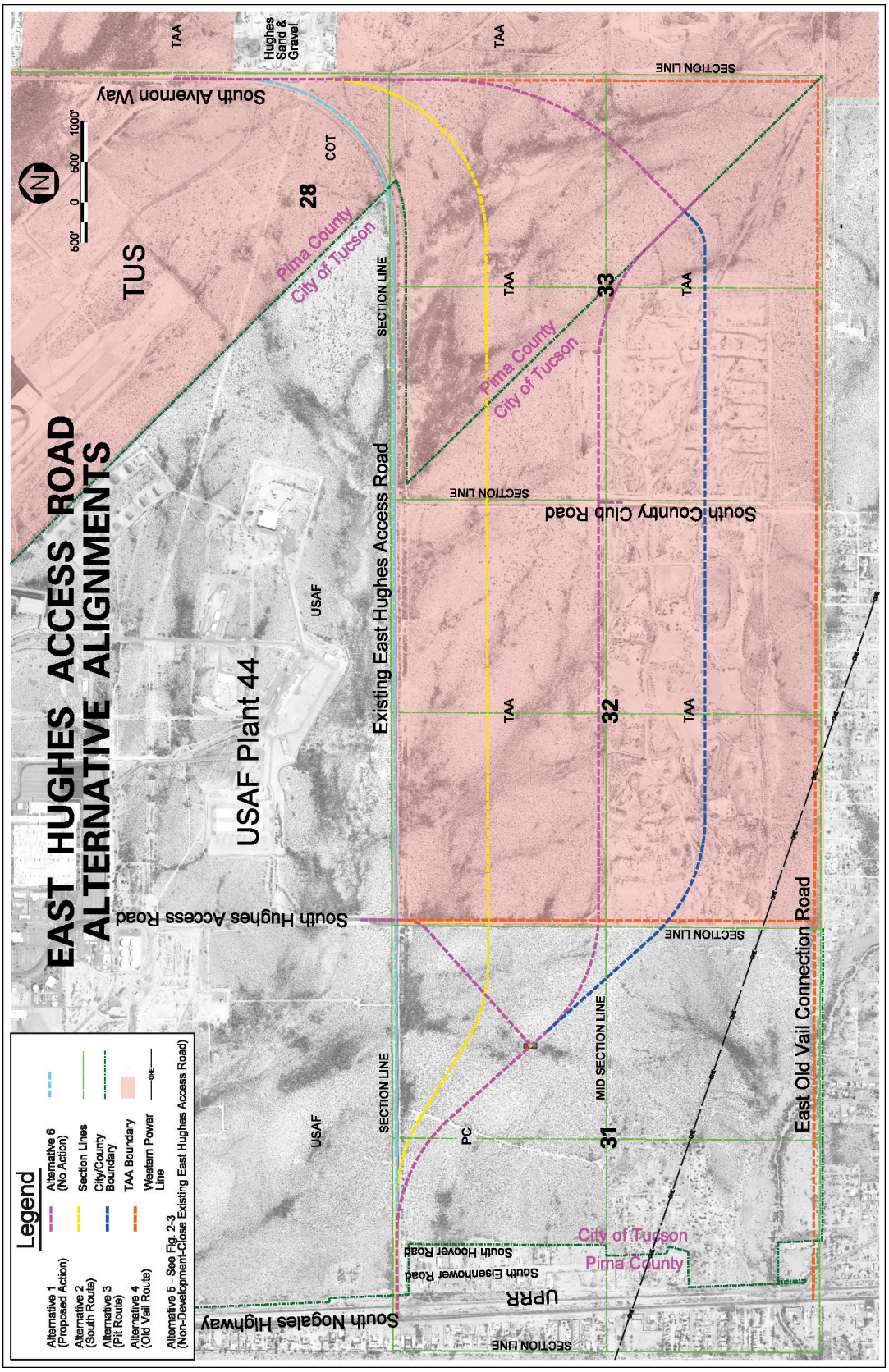

Figure 2-2. Alternatives.

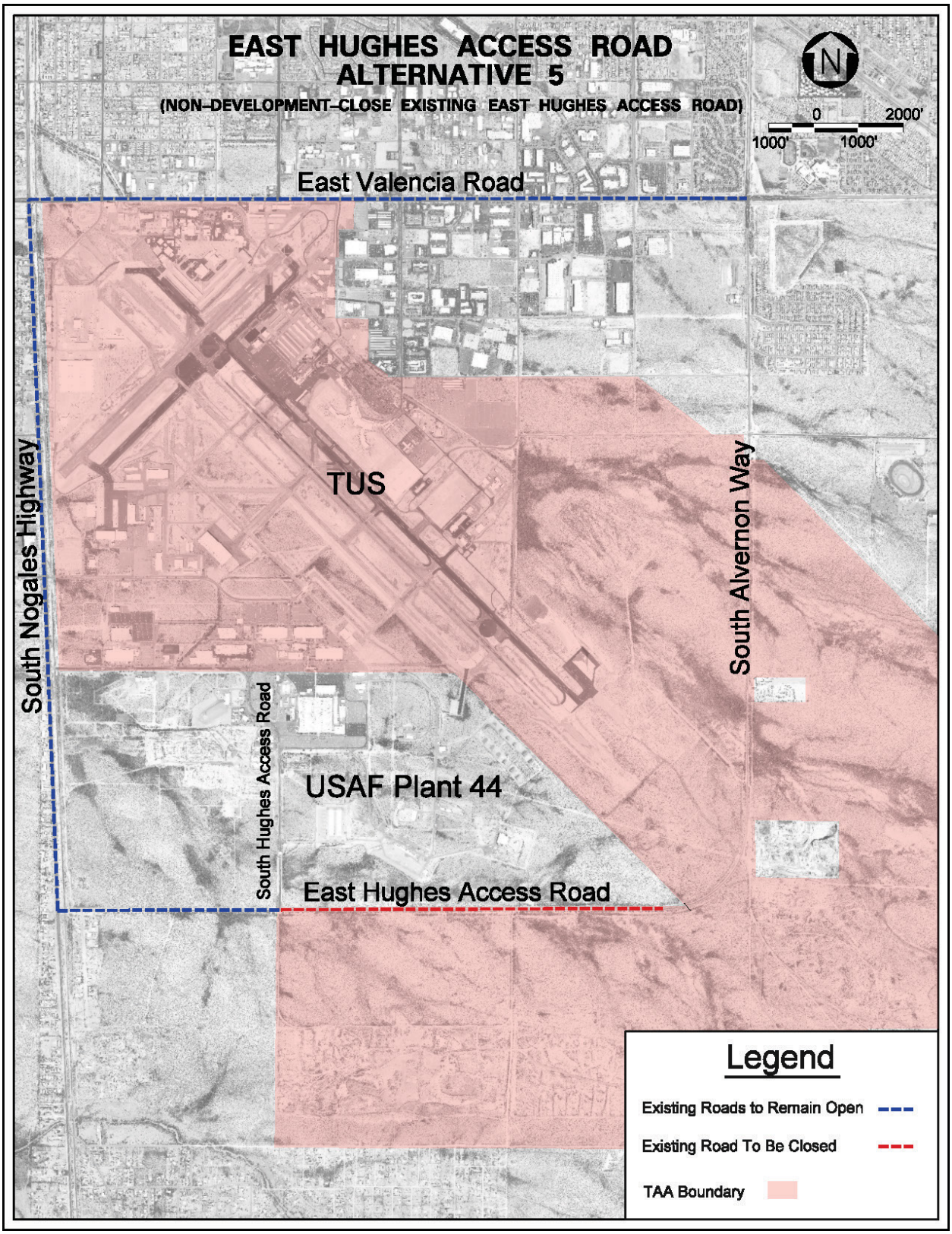

Figure 2-3. Alternative 5 - Non-development Route- Close Existing East Hughes Access Road.

Under the No Action Alternative, the alignment of East Hughes Access Road would not change. This alternative would not meet the project purpose of providing appropriate safety arc space needed for USAF Plant 44 facilities, improving access to the parcels south of TUS, and supporting future land use goals and economic growth objectives.

2.5 Summary of Alternatives Screening Process

During the development of this EA, a wide range of development and non-development alternatives were considered for addressing the need to comply with the USAF Plant 44 safety arc for continued use of the facility. The alternatives evaluation was conducted through a screening process that is discussed in **Section 2.3, Overview of the Screening Process,** and **Figure 2-1**, **Alternatives Screening Process**. The three-step evaluation process includes:

- Step 1. Does the proposed realignment of East Hughes Access Road comply with the USAF safety arc and FAA Airport Design Standards?
- Step 2. Could the land be acquired by Pima County so the relocated roadway can be operational by December 31, 2015?
- Step 3: Does the proposed alignment of East Hughes Access Road comply with future land use plans and economic growth objectives?

The alternatives screening process for this EA is summarized in Table 2-1. Alternative 1 – Proposed Action has been carried forward for evaluation in this EA. Alternative 1 – Proposed Action is fully evaluated in this EA because it fulfills the stated purpose of and need for this project and passes all of the screening process steps. The Proposed Action would be located outside the required safety arc for the USAF Plant 44 facilities, would be located on land that is readily available and has conditions that would be conducive to being constructed and operational by December 31, 2015, and would support future land use goals and economic growth objectives by improving access to parcels south of TUS in a manner that would encourage a full and orderly development of those parcels by future aerospace, defense and logistics industries. Construction activities that would occur under Alternative 1 – Proposed Action, clearances and permits that would be required, and a listing of federal laws and regulations that are considered are described in **Section 2.6**, **Section 2.7,** and **Section 2.8**, respectively, below.

Table 2-1. Summary of Alternatives Screening Process

Alternatives Considered	Does the Alternative Pass to the Next Step?			Retain for Analysis in the EA
	Step 1	Step 2	Step 3	
Alternative 1 – Proposed Action	Yes	Yes	Yes	Yes
Alternative 2 – South Route	Yes	Yes	No	No
Alternative 3 – Pit Route	Yes	No	No	No
Alternative 4 – Old Vail Route	Yes	No	No	No
Alternative 5 – Non-development Route	Yes	Yes	No	No
Alternative 6 – No Action Alternative	No*	No	No	Yes

*The No Action Alternative is retained for analysis of environmental consequences under CEQ regulations 40 CFR 1502.14(d).

2.6 Alternative 1 – Proposed Action Construction Activities

Project planning would restrict disturbances to within the project area (see **Figure 2-4**). Impacts to existing vegetation would be minimized in the following ways: project plans would clearly depict project limits, and special provisions would note that the contractor must stay within the project limits; initial

staking and marking during preconstruction survey to clearly define project limits in the field and installation of strategically placed preservation fencing before other construction activities begin would distinguish areas for construction from areas for preservation; and maintenance of existing traffic would be limited to the east and west connection points of the project, thereby ensuring that the contractor would have more flexible use of the ROW since it would not have to be shared with traffic. To minimize erosion and sedimentation, and hence stormwater pollution, during and after construction activities, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented (see **Section 4.8, Water Quality**).

Access to the project area would be from the existing East Hughes Access Road or South Alvernon Way. No detours are anticipated because the new road alignment does not currently carry traffic, and at least one lane on existing roadways would remain open during construction. Access to all adjacent properties would be maintained during construction, and construction activities would be scheduled to avoid disrupting activities at the adjacent properties.

The Proposed Action includes the following construction activities (numbered items below correspond to numbered call-outs in **Figure 2-4**):

1. relocation of existing two-lane undivided roadway and tie-back into East Hughes Access Road and the extension of South Alvernon Way;
2. two 11-foot lanes with 10-foot shoulders on either side of the roadway (6 feet paved and 4 feet graded) (see **Figure 2-5**);
3. construction of an approximately 0.4-mile-long entry road to USAF Plant 44 (i.e., new South Hughes Access Road);
4. tie-back of new South Hughes Access Road into existing South Hughes Access Road (i.e., entry road to USAF Plant 44);
5. stripe obliteration and restriping of existing South Hughes Access Road on USAF property (i.e., entry road to USAF Plant 44);
6. removal of pavement at tie-backs on the west and east ends to prevent access from the relocated East Hughes Access Road to the existing East Hughes Access Road;
7. construction of turn lanes at the intersections of the relocated East Hughes Access Road with South Hughes Access Road, South Country Club Road, and South Alvernon Way;
8. new traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Hughes Access Road;
9. new flashing traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Alvernon Way;
10. relocation of the T-intersection of East Hughes Access Road and South Country Club Road 2,500 feet south of the existing location;
11. relocation of the driveway on South Alvernon Way for the access road to existing businesses 160 feet southeast of the existing driveway location;
12. construction of drainage improvements at 17 locations (see **Appendix A** for locations of drainage improvements, typical cross section, plan and profile, and detail graphic);
13. removal of 4.1 acres of pavement—0.9 acre of existing East Hughes Access Road and South Alvernon Way to close public access after construction of the relocated East Hughes Access Road and 3.2 acres of existing wildcat roads;

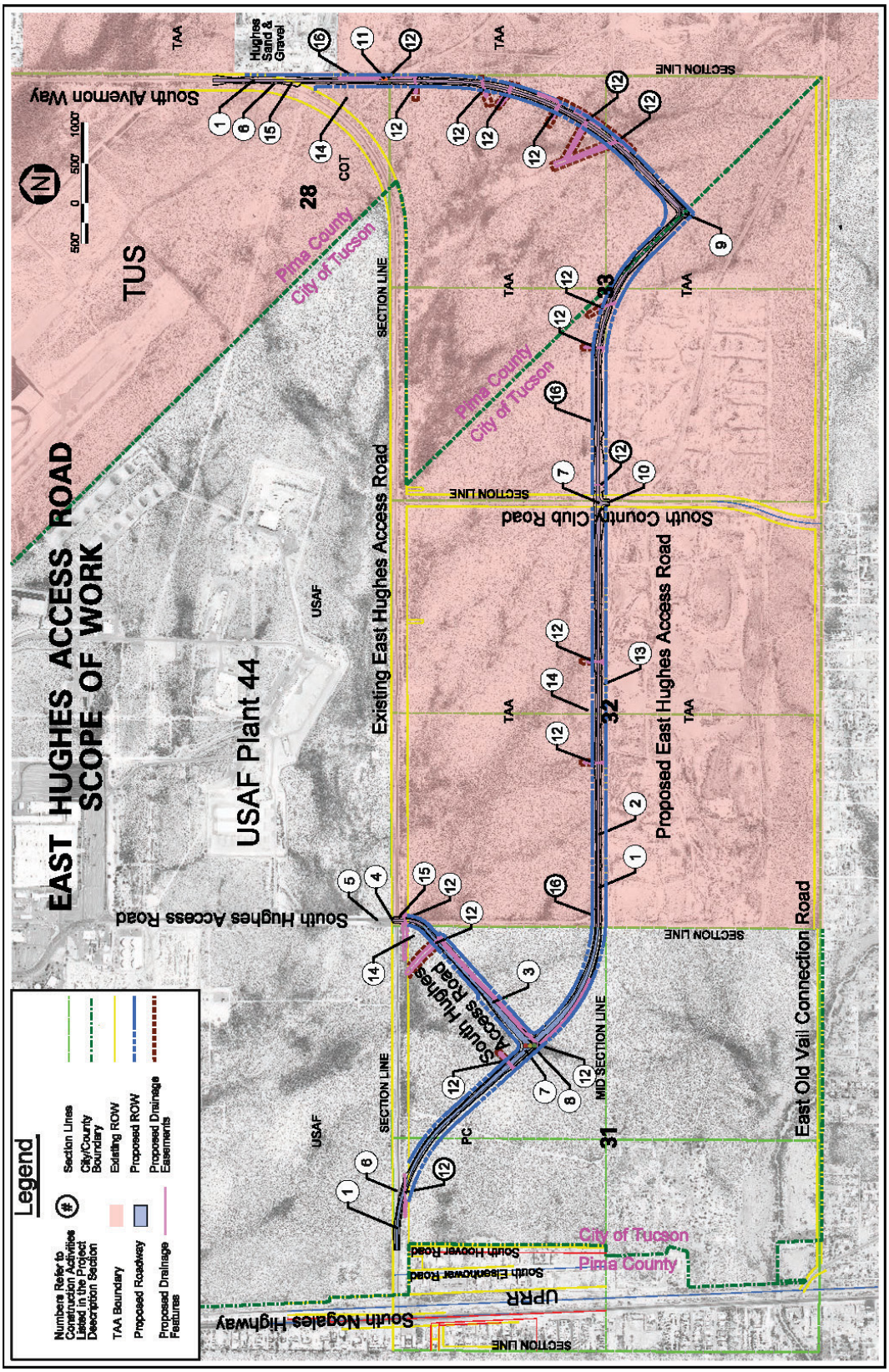

Figure 2-4. Scope of work.

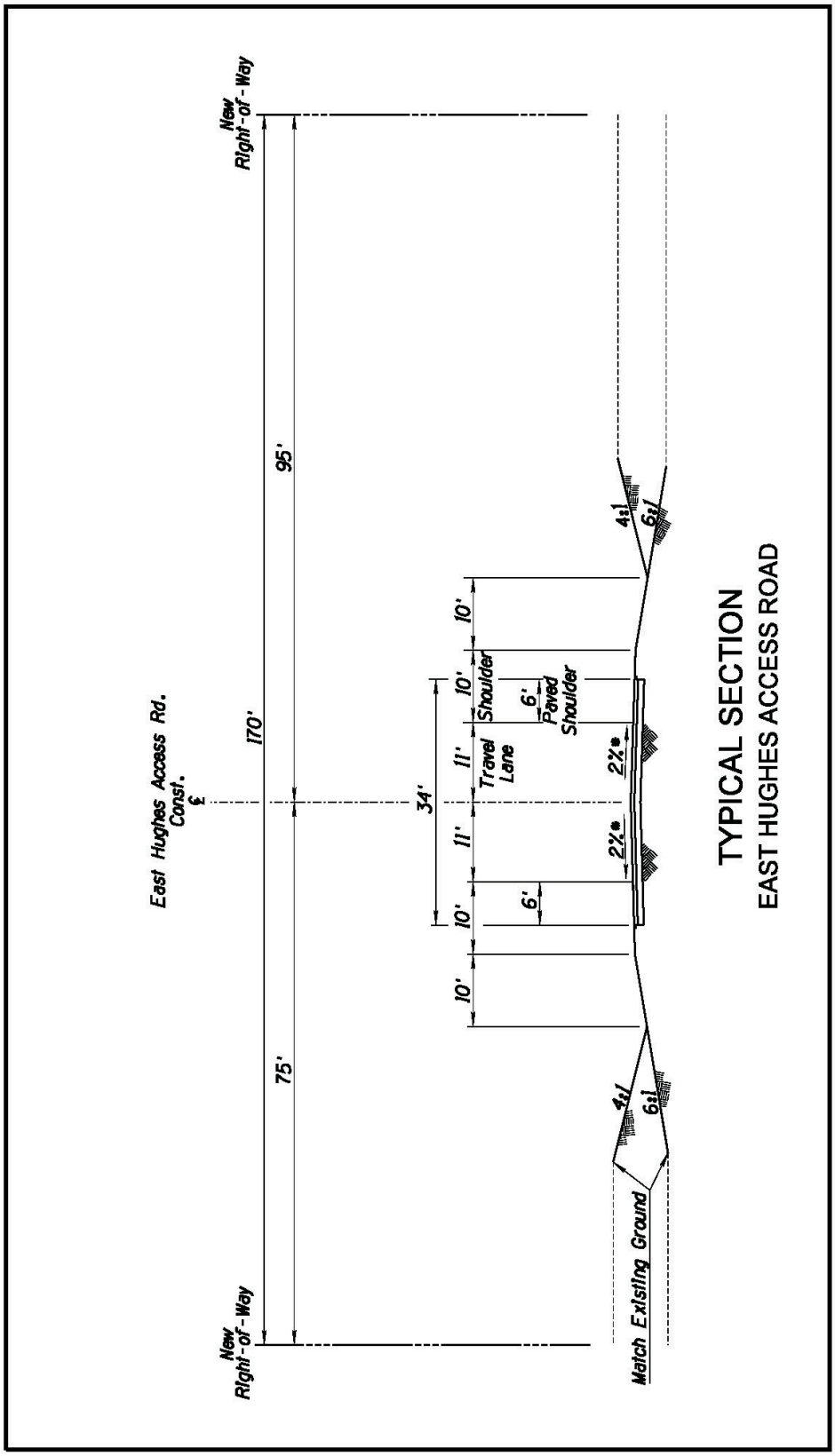

Figure 2-5. Typical cross section.

14. potential use of approximately 5 acres for material management areas outside new ROW that the contractor may use for the storage of equipment and materials during construction;[2]
15. removal and relocation of overhead utilities (i.e., Tucson Electric Power, CenturyLink, and Comcast); and
16. to construct the relocated roadway, Pima County will acquire and establish the road ROW and drainage easements. Of the 79.57 acres of new ROW needed, Pima County will purchase at fair market value 51.12 acres from TAA and 4.49 acres from COT, and establish 23.96 acres of ROW from Pima County owned property. Of the 7.55 acres of drainage easements, Pima County will purchase 6.04 acres from TAA at fair market value and dedicate 1.51 acres from Pima County owned property for construction of the relocated roadway.

2.7 Permits or Clearances Required by Alternative 1 – Proposed Action

In accordance with FAA Order 1050.1E, paragraph 405d (4), a preliminary list of permits that would be required for implementation of the Proposed Action is provided in **Table 2-2**.

Table 2-2. Required Federal and State Permits

Issuing Agency	Permit Name/Type
Federal	
U.S. Army Corps of Engineers	Clean Water Act Section 404 Nationwide Permit 14
State and County	
Arizona Department of Environmental Quality	SWPPP that meets the requirements of the current Arizona Pollutant Discharge Elimination System General Permit for Discharge from Construction Activities to the Waters of the United States
Arizona Department of Environmental Quality	Clean Water Act Section 401 Conditional Permit comes with 404 Permit (see above)
Arizona Department of Agriculture	Notice of Intent to Clear Land
PCDOT	Grading Permit reviewed and issued as part of the ROW permit process
Pima County Department of Environmental Quality	Air Quality Activity Permit for Dust

2.8 Listing of Federal Laws and Regulations Considered

In accordance with FAA Order 1050.1E, Paragraph 405d(4), the relevant federal laws, statutes, and regulations; EOs; and U.S. Department of Transportation (USDOT) and FAA orders, FAA Advisory Circulars, and other federal guidance considered during preparation of this EA are listed in **Tables 2-3** through **2-5,** Federal Laws and Regulations Considered, Executive Orders Considered, and FAA Orders, Advisory Circulars, and Other Federal Guidance Considered, respectively.

[2] Material management areas are ones that the contractor may use for the storage of equipment during construction. The three material management areas each have different land ownership: Pima County, the TAA, and the COT. The material management areas were chosen in soil types that do not provide habitat for Pima pineapple cactus within the project area (or within disturbed areas where no Pima pineapple cactus were found) and would have minimal impact to saguaros. Although these areas have been identified, it is possible that they will not need to be used because the new ROW is expected to be able to accommodate all the necessary equipment and materials.

Table 2-3. Federal Laws and Regulations Considered

Federal Law or Statute	Citation
National Environmental Policy Act	Public Law (P.L.) 91-190, 42 U.S.C. 4321-4370(d), effective January 1, 1970, as amended by P.L. 94-83
Clean Air Act of 1970, as amended	P.L. 91-604, P.L. 101-549, 42 U.S.C. 7401–7671
Department of Transportation Act of 1966, Section 4(f)	59 U.S.C. 303(c)
Federal Aviation Act	P.L. 103-305, 49 U.S.C. 40101
Endangered Species Act of 1973	P.L. 93-205, 16 U.S.C. 1531
Community Environmental Response Facilitation Act of 1992	42 U.S.C. 6901–6992
Solid Waste Disposal Act of 1980	42 U.S.C. 6901–6992(k)
National Historic Preservation Act of 1974, as amended	P.L. 89-665, 16 U.S.C. 470
Archaeological and Historic Preservation Act of 1966, as amended	16 U.S.C. 469
Clean Water Act of 1974, as amended	P.L. 92-500, 33 U.S.C. 1251
Clean Water Act, Section 404	33 U.S.C. 1344
Protection of Historic and Cultural Properties	36 CFR 800
Migratory Bird Treaty Act of 1981	16 U.S.C. 703–712

Table 2-4. Executive Orders Considered

Executive Order	Citation
EO 11296, Evaluation of Flood Hazard in Locating Federally Owned or Financed Buildings, Roads, and Other Facilities, and in Disposing of Federal Lands and Properties	31 Federal Register (FR) 10663 et seq. (May 24, 1977)
EO 11593, Protection and Enhancement of Cultural Environment	36 FR 8921 et seq. (May 13, 1971)
EO 11988, Floodplain Management	43 FR 26951 et seq. (May 24, 1977)
EO 11990, Protection of Wetlands	43 FR 26961 et seq. (May 24, 1977)
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	59 FR 7629 et seq. (February 11, 1994)
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	62 FR 19885–19888 (April 23, 1997)
EO 13112, Invasive Species	64 FR 6183–6186 (February 3, 1999)

Table 2-5. FAA Orders, Advisory Circulars, and Other Federal Guidance Considered

FAA Orders, Advisory Circulars, and Other Federal Guidance
FAA Order 1050.1E, Environmental Impacts: Policies and Procedures
FAA Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions
FAA Advisory Circular 150/5300-13A, Airport Design
USDOT Order 5650.2, Floodplain Management and Protection
USDOT Order 5660.1A, Preservation of the Nation's Wetlands
USDOT Order 5680.1, Final Order to Address Environmental Justice in Low-Income and Minority Populations

3 Affected Environment

3.1 Introduction

This chapter provides a description of the existing conditions within the study area. The environmental resource categories are organized as identified in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures* (U.S. Department of Transportation 2006b), and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* (U.S. Department of Transportation 2006a). The potential environmental impacts of the Proposed Action and the No Action alternatives retained for analysis of environmental consequences are presented in **Chapter 4, Environmental Consequences and Mitigation Measures,** of this EA.

The following environmental resource categories are not present in the study area and therefore would not be affected by either the No Action or the Proposed Action alternatives: Coastal Resources, Department of Transportation Act - Section 4(f), Farmlands, Floodplains, Noise, Wetlands, and Wild and Scenic Rivers. There are no coastal zones in the state of Arizona. There are no resources protected by Department of Transportation Act, Section 4(f), farmlands, floodplains, wetlands, or Wild and Scenic Rivers in the study area. The nearest Wild and Scenic River to the proposed East Hughes Access Road relocation site is a segment of the Verde River more than 150 miles to the north of Tucson. Considering the environmental impact category of noise, aircraft ground and flight operations are the dominant noise generator at an airport, not surface roadway traffic. The proposed road relocation project will not affect the number and frequency of aircraft operations (takeoffs and landings) conducted at TUS. The nearest noise-sensitive receptor is over 0.5 mile away from the proposed relocated road. The relocated roadway will not have an increased capacity for automobile traffic over the existing roadway, and traffic levels on the relocated East Hughes Access Road are expected to be the same as the traffic levels on the existing East Hughes Access Road. Therefore, the noise environmental impact category will not be further evaluated in this EA.

The potential environmental impacts of the No Action and Proposed Action alternatives retained for analysis of environmental consequences are presented in **Chapter 4, Environmental Consequences and Mitigation Measures**. **Chapter 4** also includes analysis of construction impacts and cumulative effects.

The following environmental resources are assessed in this EA:

- Air Quality
- Compatible Land Use
- Fish, Wildlife, and Plants
- Hazardous Materials, Pollution Prevention, and Solid Waste
- Historical, Architectural, Archaeological, and Cultural Resources
- Socioeconomic Impacts, Environmental Justice, Children's Environmental Health and Safety Risks
- Secondary (Induced) Impacts
- Water Quality
- Light Emissions and Visual Impacts
- Natural Resources and Energy Supply

3.1.1 Study Area Definition

For most resources, the analysis area for the proposed project is the new ROW that would be required to relocate East Hughes Access Road and the ROW for the existing alignment of East Hughes Access Road. Some resources such as socioeconomics have a wider analysis area in order to accommodate a potentially broader impact than the physical location. In these instances, the analysis area is specified in the respective resource sections. To improve clarity, the term "project area" is used when describing the areas of physical disturbance where construction would be required, such as the new ROW, drainage easements, material management areas, areas where existing pavement will be removed, and areas for utility relocations, etc., under the Proposed Action. **Section 3.3** identifies the land ownership of the ROW for the existing East Hughes Access Road and the new ROW that would be required to relocate the road.

3.2 Air Quality

3.2.1 Clean Air Act and National Ambient Air Quality Standards

Since 1970, the federal Clean Air Act (CAA) and subsequent amendments have provided the authority and framework for U.S. Environmental Protection Agency (EPA) to regulate air pollutants. In addition to the EPA, air quality is also regulated by the Pima County Department of Environmental Quality.

The EPA has promulgated primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), two size categories of particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), and lead (Pb). Pima County has standards identical to the federal levels. **Table 3-1** presents the NAAQS for five of the six "criteria" pollutants, including both primary standards (pertaining to human health) and secondary standards (pertaining to human welfare, such as visibility, socioeconomics, and effects on flora and fauna). Lead has generally not posed a problem since the removal of lead from gasoline, and lead monitoring in Pima County indicates that ambient lead levels are below the primary and secondary standards for NAAQS.

Table 3-1. National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m³*	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8,1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb†	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm‡	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution Dec 14, 2012	$PM_{2.5}$	primary	Annual	12 µg/m³	Annual mean, averaged over 3 years
		secondary	Annual	15 µg/m³	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m³	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 µg/m³	Not to be exceeded more than once per year on average over 3 years

Table 3-1. National Ambient Air Quality Standards (continued)

Pollutant [final rule cite]	Primary/ Secondary	Averaging Time	Level	Form
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]	primary	1-hour	75 ppb§	99th percentile pf 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: NAAQS (2012) Air and Radiation (EPA 2011).

Notes: $\mu g/m^3$ – micrograms per cubic meter; ppm – parts per million.

* Final rule signed October 15, 2008. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

† The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

‡ Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

§ Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

The CAA requires that transportation projects, programs, and plans conform to the approved state implementation plan (SIP). The Tucson Air Planning Area was classified by the EPA as a maintenance area for CO in 1996. In 2008, Pima Association of Governments submitted a SIP revision to the EPA to revise the CO Limited Maintenance Plan (LMP) in accordance with §107(d) of the CAA, to ensure maintenance of the NAAQS in the Tucson Air Planning Area for a second 10-year period through year 2020. This 10-year plan essentially maintains existing controls and contingency provisions, and it succeeds the previous plan approved by the EPA in 2000. The revised SIP demonstrated that CO levels are expected to remain well below the NAAQS for the 10-year period ending in 2020. The EPA approved the plan in December 2009. The project area is not in a non-attainment area for any of the five remaining criteria pollutants.

Existing traffic on East Hughes Access Road contributes to the emissions of "criteria" pollutants through the burning of fossil fuels. However, these emissions do not contribute to exceedances of NAAQS for the Tucson Air Planning Area.

3.2.2 Greenhouse Gas Emissions and Climate Change

Research has shown there is a direct correlation between fuel combustion and greenhouse gas (GHG) emissions. In terms of U.S. contributions, the Government Accountability Office (GAO) reports that "domestic aviation contributes about 3% of total carbon dioxide emissions, according to the EPA data," compared with other industrial sources including the remainder of the transportation sector (20%) and power generation (41%) (GAO 2009). The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly 3% of all anthropogenic GHG emissions globally (Melrose 2010). Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate (EPA 2009a).

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., National Aeronautics and Space Administration [NASA], National Oceanographic and Atmospheric Administration [NOAA], EPA, and Department of Energy [DOE]), has developed the Aviation Climate Change Research Initiative

(ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for AiR Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the ICAO (Maurice and Lee 2009).

3.3 Compatible Land Use

Land ownership in the project area varies by location (see **Figure 1-3**). The existing East Hughes Access Road is located partially on a series of ROW easements or leases granted by the TAA, the USAF, and the COT. **Figures 1-4** and **1-5** show the locations where new fee simple ROW would be required, the existing and future roadway easements, and future drainage easements.

Land ownership on adjacent lands varies from land owned by the TAA and the COT, to land owned by the USAF and Pima County (see **Figure 1-3**). The TAA and Pima County own the majority of land where the Proposed Action would be located. Additionally, the COT owns land where the Proposed Action would tie into South Alvernon Way, and Pima County owns land within the western portion of the Proposed Action. Land held by the COT is subject to the TAA master lease and would not be removed from the TUS ALP (TAA 2013).

Average daily traffic on the existing East Hughes Access Road is currently estimated at 14,600 vehicles per day. Traffic along East Hughes Access Road is used to access the USAF Plant 44 facilities that are leased by Raytheon, as well as to connect to South Nogales Highway and South Alvernon Way. The Pima County Natural Resources, Parks and Recreation (PCNRPR) department identifies three trails in the *Pima County Regional Trail System Master Plan* (revised in 2012) that either cross East Hughes Access Road or use a segment of the road as part of a trail (PCNRPR 2012).

The lands immediately adjacent to the existing East Hughes Access Road are primarily undeveloped natural desert, with Raytheon, USAF, and TUS operations located farther north. Because the lands to the north of East Hughes Access Road are zoned for and in the proximity of defense and aviation facilities, these undeveloped lands are not accessible by the public. Facilities and operations at the USAF Plant 44 require safety arc in order to ensure public safety on East Hughes Access Road. The safety arc for the USAF Plant 44 facilities was designed for the condition of anticipated traffic volumes on East Hughes Access Road of 5,000 trips per day. Because traffic has exceeded 5,000 trips per day, the roadway must operate within this safety arc under multiple wavers issued by the DoD. The southern extent of the safety arc where it overlaps the existing East Hughes Access Road is shown in **Figure 1-3**.

Lands adjacent to the proposed road relocation are also primarily undeveloped natural desert. Several active and inactive private mineral aggregate (sand and gravel) mining operations on TAA parcels are located farther to the south and east of the proposed road relocation. Industrial land use exists adjacent to the intersection of South Nogales Highway and the existing East Hughes Access Road.

Several land use and economic development plans cover the existing alignment of East Hughes Access Road and the proposed relocation area: the *2012 TUS Master Plan Update* (TAA 2013), the *Pima County Economic Development Plan, 2012 to 2014* (Pima County Board of Supervisors 2012), and Pima County's (2013) *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*.

The *2012 TUS Master Plan Update* identifies the anticipated future land use of the TAA parcels for large-scale industrial, industrial/logistics, and natural corridor/mitigation land uses with specific goals to increase economic development and revenue to the airport. According to the plan, large-scale industrial use includes "sites that can accommodate aerospace and defense manufacturing, research and development, technology, biosciences uses, and other similar intense industrial activities" (TAA 2013:11). Large-scale industrial land use is zoned for the areas immediately north and south of the

proposed project area. This designation will "typically reflect master planned, large scale single tenant facilities" (TAA 2013:11). The industrial/logistics land use is defined as "sites that provide compatible light industrial and transportation-related development activities, including logistics and freight intermediary operations" (TAA 2013:11). Industrial/logistic land use is zoned for areas immediately east of South Alvernon Way. The natural corridor/mitigation land use includes "corridors that can safely support riparian habitat enhancement to offset development impacts to locally delineated habitat" (TAA 2013:11). Natural corridor/mitigation land use is zoned immediately adjacent to the south of the existing East Hughes Access Road.

The *Pima County Economic Development Plan, 2012 to 2014* was created to identify and recommend near-term economic development opportunities that support a steady and prolonged recovery of Pima County's economic conditions. The objectives of this plan are to protect existing employers, create new opportunities for job growth, revitalize tourism, and create a positive climate for business and improving business service in Pima County (Pima County Board of Supervisors 2012:3). The plan specifically identifies the need to relocate East Hughes Access Road in order to meet the objectives of protecting existing employers and creating new opportunities for job growth.

Pima County's Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation generally mirrors the goals and objectives of the Pima County Economic Development Plan, 2012 to 2014 for the land around the TUS. The primary objective of this plan is "to retain and grow new high-technology aerospace and defense jobs in the vicinity of TUS and to encourage significant science and technology-based job growth in the Tucson Technology Corridor, including the University of Arizona Science and Technology Park." The first goal identified in the plan is to relocate East Hughes Access Road to the south in order to allow for the expansion of Raytheon and "to provide land for possible expansion for operating, manufacturing and assembly facilities, as well as allow for significant engineering and research expansion." To achieve this goal, Pima County proposes to buffer the existing and potential future Raytheon facilities from the existing East Hughes Access Road to the proposed relocation alignment.

The current alignment of East Hughes Access Road prevents the TAA parcels from being fully developable for the desired land uses identified in these plans because the alignment does not provide access to the southern areas of these parcels.

3.4 Fish, Wildlife, and Plants

In April and November 2013, the project area was surveyed by SWCA Environmental Consultants (SWCA). The purpose of the surveys was to describe and investigate the botanical and vertebrate resources of the proposed project area and to ascertain the potential for adverse impacts to biological resources and whether mitigation measures would be required.

There are no surface water resources at the project site, so fish resources were not included in the study.

3.4.1 Vegetation

The project area is located in the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994) (**Figures 3-1** and **3-2**). Vegetation associated with upland areas is relatively undisturbed and is dominated by creosote bush (*Larrea tridentata* var. *tridentata*) (SWCA 2014a, 2014b). Other plant species that occur include saguaro (*Carnegiea gigantea*), ocotillo (*Fouquieria splendens*), cholla (*Cylindropuntia* spp.), barrel cactus (*Ferocactus wislizeni*), desert zinnia (*Zinnia acerosa*), desert marigold (*Baileya multiradiata*), paper flower (*Psilostrophe cooperi*), globemallow

Figure 3-1. Typical view of project area, facing west.

Figure 3-2. View of ephemeral wash, facing northwest.

(*Sphaeralcea* sp.), galleta grass (*Pleuraphis* sp.), bush muhly (*Muhlenbergia porteri*), and deergrass (*M. rigens*). Xeroriparian vegetation along and within the ephemeral washes is dominated by velvet mesquite (*Prosopis velutina*) and yellow palo verde (*Parkinsonia microphylla*) in the overstory and whitethorn acacia (*Acacia constricta*), wolfberry (*Lycium* sp.), and graythorn (*Ziziphus obtusifolia*) in the midstory. No aquatic habitats (e.g., wetlands, springs, stock tanks, etc.) or broadleaf deciduous riparian vegetation communities occur in the project area.

One plant species on the Arizona Department of Agriculture's (ADA's) List of Prohibited, Regulated and Restricted Noxious Weeds (Plant Services Division 2005), buffelgrass (*Pennisetum ciliare*), is common within the project area (SWCA 2014a, 2014b).

One plant species currently listed as endangered under the Endangered Species Act (ESA), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), was recorded in the project area (SWCA 2014a, 2014b), and is discussed in more detail in **Section 3.4.3.**

3.4.2 General Wildlife

Identification of wildlife within the project area was conducted during surveys of the project area in April and November 2013 (SWCA 2014a, 2014b). The federally listed species and other special status species identified as occurring or with the potential to occur in the project area are identified below. Species that were identified in the project area during the biological resource surveys that are not federally listed or special status species are identified in **Table 3-2**.

Table 3-2. List of Wildlife Species Observed in the Project Area

Scientific Name	Common Name
Reptiles	
Callisaurus draconoides	Zebra-tailed lizard
Crotalus atrox	Western diamondback rattlesnake
Holbrookia maculata	Lesser earless lizard
Birds	
Amphispiza bilineata	Black-throated sparrow
Auriparus flaviceps	Verdin
Buteo jamaicensis	Red-tailed hawk
Carpodacus mexicanus	House finch
Corvus corax	Common raven
Melanerpes uropygialis	Gila woodpecker
Myiarchus cinerascens	Ash-throated flycatcher
Oreothlypis luciae	Lucy's warbler
Picoides scalaris	Ladder-backed woodpecker
Spizella breweri	Brewer's sparrow
Mammals	
Ammospermophilus harrisii	Harris ground squirrel
Spermophilus tereticaudus	Round-tailed ground squirrel

3.4.3 Federally Listed Species

This section considers the potential for species protected under the ESA to occur within the project area. Based on SWCA's review of the most recent U.S. Fish and Wildlife Service (USFWS) list for Pima County and a search of the Arizona Game and Fish Department (AGFD) Heritage Data Management System (HDMS), it was determined that two endangered species may occur (or are known to occur) in the project area: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) and Pima pineapple cactus. Neither of these species have designated or proposed critical habitat. For the remaining species listed as threatened or endangered by USFWS for Pima County, the project area is either clearly beyond the known geographic or elevational range of these species and/or it does not contain vegetation or landscape features known to support these species (SWCA 2014b:Table 2).

3.4.3.1 Lesser Long-nosed Bat

The lesser long-nosed bat is listed as endangered under the ESA and is identified as a Species of Greatest Conservation Need in Arizona (AGFD 2012). The project area occurs in the elevational and geographical range of the lesser long-nosed bat. However, there are no reported occurrences of this species within 3 miles of the project area (Arizona Heritage Geographic Information System [AZHGIS] 2013), and roosting habitat (i.e., caves, underground mines, crevices, etc.) is not located within the project area or in the project vicinity. No species-specific surveys have been conducted for the purposes of this project because the least invasive survey method involves acoustic monitoring, but this species is difficult to detect acoustically, and because of the great distance to known roosts sites (i.e., 20–60 miles from the project area). However, surveys for saguaros, a forage plant for this species, were conducted within a 350-acre survey area surrounding the project area in April and November 2013 (300 acres were surveyed in April, and an additional 50 acres were surveyed in November), and 254 saguaros of varying sizes were inventoried in the survey area. Of these saguaros, approximately 85 (33%) are at least 8 feet tall and thus are likely to flower/fruit; these may provide forage resources for lesser long-nosed bats within the project area. Forty-one saguaros were inventoried within the 106-acre project area, of which 14 (34%) are ≥ 8 feet tall. A more detailed description of these surveys is included in the Biological Assessment (see **Appendix E).**

3.4.3.2 Pima Pineapple Cactus

The Pima pineapple cactus is listed as endangered under the ESA and is protected as a highly safeguarded and salvage restricted[3] plant by the ADA. The project area lies within the current distribution (USFWS 2008) and elevational range of Pima pineapple cactus (USFWS 2005), and there are reported occurrences of this species within 3 miles of the project area (AZHGIS 2013). In April and November 2013, SWCA conducted a pedestrian survey for Pima pineapple cactus in accordance with the survey protocol recommended by USFWS within a 350-acre survey area surrounding the project area in 2013 (300 acres were surveyed in April, and an additional 50 acres were surveyed in November). A more detailed description of the species-specific surveys is included in the Biological Assessment (see **Appendix E).** Thirty Pima pineapple cacti were detected during these surveys (and while conducting other surveys in the project area [i.e., native plant and Sonoran desert tortoise]), of which nine are within the project area. Within the project area, Pima pineapple cactus is found growing in two soil types: 1) Sahuarita soils, Mohave Soils, and urban land with 1% to 5% slopes; and 2) Stagecoach-Sahuarita Association with 1% to

[3] Includes those species of native plants and parts of plants, including the seeds and fruit, whose prospects for survival in this state are in jeopardy or that are in danger of extinction throughout all or a significant portion of their ranges, and those native plants that are likely within the foreseeable future to become jeopardized or in danger of extinction throughout all or a significant portion of their ranges. This category also includes those plants resident to this state and listed as endangered, threatened, or category 1 in the federal Endangered Species Act of 1973, as amended, and any regulations adopted under that act.
[3] Includes those native plants that are not included in the highly safeguarded category but that are nevertheless subject to a high potential for damage by theft or vandalism.

8% slopes. There are approximately 70 acres of these soils types (i.e., Pima pineapple cactus habitat) within the 106-acre project area.

3.4.4 Special Status Species

Special status species include USFWS Candidate and Species of Concern, Arizona Species of Greatest Conservation Need, and plants protected under the Arizona Native Plant Law (Section 3-901 to 3-916 and Article 11). The AGFD online environmental review tool was accessed to determine special status species known to occur in the project vicinity (AZHGIS 2013). According to the AZHGIS online environmental review tool, there are occurrence records for one species within 3 miles of the project area: Pima pineapple cactus. The Pima pineapple cactus is discussed above under **Section 3.4, Fish, Wildlife, and Plants**.

3.4.4.1 Sonoran Desert Tortoise

Based on SWCA's search of the AGFD's HDMS, it was determined that one special status species, also a USFWS candidate species, has a reasonable potential to occur in the project area: Sonoran desert tortoise (*Gopherus morafkai*) (SWCA 2014a, 2014b). It is possible that individuals of this species could breed, forage, and disperse within the project area because it occurs in the elevational and species' range of the desert tortoise and because the soils and vegetation in the project area may provide habitat for this species. However, there are no reported occurrences of this species within 3 miles of the project area (AZHGIS 2013), and no desert tortoise individuals, tracks, or scat were noted during surveys for this species in the project area on June 16 and 17, 2014, or during other site visits in the survey area in April and November 2013. A more detailed description of the species-specific surveys is included in the Biological Assessment (see **Appendix E**).

3.4.4.2 State Protected Native Plants

The project area was surveyed for the presence of protected native plants in 2013 and 2014 using pedestrian surveys (SWCA 2014a, 2014b). Protected plants found within the project area are listed in **Table 3-3**.

Table 3-3. List of Protected Arizona Native Plants in the Project Area

Scientific name	Common Name	Arizona Department of Agriculture Protection Category
Carnegiea gigantea	Saguaro	Highly Safeguarded and Salvage Restricted
Cylindropuntia spp.	Cholla	Salvage Restricted
Coryphantha scheeri var. *robustispina*	Pima pineapple cactus	Highly Safeguarded and Salvage Restricted
Ferocactus wislizeni	Barrel cactus	Salvage Restricted
Fouquieria splendens	Ocotillo	Salvage Restricted
Parkinsonia microphylla	Yellow palo verde	Salvage Assessed
Prosopis velutina	Velvet mesquite	Salvage Assessed and Harvest Restricted

Status Definitions:

Highly Safeguarded. Includes those species of native plants and parts of plants, including the seeds and fruit, whose prospects for survival in this state are in jeopardy or that are in danger of extinction throughout all or a significant portion of their ranges, and those native plants that are likely within the foreseeable future to become jeopardized or in danger of extinction throughout all or a significant portion of their ranges. This category also includes those plants resident to this state and listed as endangered, threatened, or category 1 in the federal Endangered Species Act of 1973 (as amended, and any regulations adopted under that act.

Salvage Restricted. Includes those native plants that are not included in the highly safeguarded category but that are nevertheless subject to a high potential for damage by theft or vandalism.

Salvage Assessed. Includes those native plants that are not included in either the highly safeguarded or salvage restricted categories but that nevertheless have a sufficient value if salvaged to support the cost of salvage tags and seals.

Harvest Restricted. Includes those native plants that are not included in the highly safeguarded category but that are subject to excessive harvesting or overcutting because of the intrinsic value of their byproducts, fiber, or woody parts.

3.4.5 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918, as amended (MBTA) (16 U.S.C. 703–712), gives federal protection to all migratory birds, including nests and eggs. Under this act, it is unlawful to take, kill, or possess migratory birds. Although a survey for migratory birds was not completed for the purposes of this project, 10 bird species were observed during the biological resource surveys, all of which are protected under the MBTA (SWCA 2014b).

3.5 Hazardous Materials, Pollution Prevention, and Solid Waste

A Phase I Environmental Site Assessment was completed in October 2014 to identify any existing, potential, or suspect conditions resulting from the use, handling, and disposal of hazardous substances in or near the project area. These conditions are known as "recognized environmental conditions" (RECs) and are defined by the American Society of Testing and Materials as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment (2013)." The Phase I Environmental Site Assessment included a pedestrian survey of the project area, interviews and correspondence with property owners and land managers, and database searches from the Arizona Department of Environmental Quality (ADEQ), the Arizona Department of Water Resources (ADWR), and Environmental Data Resources, Inc., for RECs of the project area and adjacent land.

No RECs were identified within the project area. The database searches identified several hazardous materials storage tanks, the Tucson International Airport Area Superfund site, and other areas of environmental concern in properties adjacent to the project area. However, due to the distance of these sites from the project area and the fact that there are no known leaks or contamination from the sites, they are not considered to be RECs for the project area.

The pedestrian survey of the project area identified small illegal trash dump sites with materials that could potentially contain asbestos or lead-based paint. These materials include roofing shingles that could potentially contain asbestos and a pile of asphalt that could contain lead-based paint. Testing of these materials has not been conducted. However, these illegal trash dump sites are not considered RECs because no stained ground or unusual odors were associated with the sites and they do not present material threat of a release into the ground, groundwater, or surface water. Moreover, the volume of the roofing shingles is less than the de minimis level of 35 cubic feet for potentially asbestos containing material.

Testing for lead-based paint on road striping on the existing South Hughes Access Road was conducted on December 4, 2013. Twenty-eight individual tests were completed on the stripes at various locations on the road. Test results indicate that no lead-based paint exists on road striping on South Hughes Access Road.

3.5.1 Solid Waste Collection and Disposal

The Los Reales Landfill is located approximately 2 miles northeast of the project area. The landfill is operated by the City of Tucson Environmental Services department and was opened in 1967. The landfill is open to private commercial haulers and residential self-haulers and is the primary waste disposal site in southeastern Pima County. Approximately 1,500 tons of waste is brought to the landfill each day for disposal. The landfill is expected to be operational for the next 60 years. Residential and commercial disposal is provided by City of Tucson Environmental Services Department.

3.6 Historical, Architectural, Archaeological, and Cultural Resources

Section 106 of the National Historic Preservation Act requires all federal agencies to assess the effects of any agency-sponsored undertaking on historic properties—cultural properties listed in or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60.4). Under NEPA (42 U.S.C. 4321–4327), federal agencies are required to consider potential environmental impacts and appropriate mitigation measures for projects with federal involvement. The process FAA follows for Section 106 consultation is established by regulations outlined in 36 CFR 800.

3.6.1 Area of Potential Effects

The area of potential effects (APE) is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties (36 CFR 800.16(d)). The FAA defined the project APE for direct and indirect effects on historic properties as the entire project footprint of the proposed roadway relocation, as shown as the Project Area in **Figure 1-2**. The APE is an area measuring 106 acres and comprising the new road ROW, areas of existing road ROW required for project construction, areas where the abandoned road would be removed, material management areas, vegetation transplant areas, areas where utilities would be relocated, areas necessary for the construction of new drainage structures, and any other areas of ground disturbance. The FAA consulted with the State Historic Preservation Office (SHPO) on the FAA's determination of the APE in a letter to the SHPO on April 17, 2014, and the SHPO concurred with the determination of the APE on April 21, 2014 (**Appendix B**).

3.6.2 Identification of Historic Properties

A Cultural Resource Survey was prepared for the proposed undertaking (SWCA 2014c). The purpose of the study was to identify any properties located within the APE that are listed or eligible for listing in the NRHP. An adverse effect is the adverse alteration of characteristics of a historic property that qualify it for inclusion in or eligibility for the NRHP. Historic properties may include buildings, structures, sites, objects, and districts of importance in prehistory or history.

The cultural resources inventory consisted of a records search and literature review, as well as an archaeological pedestrian survey of the APE.

The background research included a review of the ethnographic and historic literature and maps, as well as a review of archaeological projects and site records available through AZSITE database and the Arizona State Museum archaeological records office. No known historic properties were identified within the APE as a result of the research.

The archaeological pedestrian survey was conducted between March 11 and April 12, 2013, and the results of the surveys are reported in the *Cultural Resource Inventory for the Hughes Access Road Relocation Project, Pima County, Arizona* (SWCA 2014c). Archaeological survey of the APE resulted in the identification of one archaeological site, two historic (i.e., more than 50 years in age) paved roads (South Alvernon Way and East Hughes Access Road), and 12 isolated artifacts or small clusters of artifacts. The FAA has determined that none of these properties qualify as historic properties (i.e., they do not meet the criteria for listing in the NRHP).

3.7 Socioeconomic Impacts, Environmental Justice, Children's Environmental Health and Safety Risks

This section describes the existing socioeconomic conditions of the City of Tucson and Pima County. The issues relevant to the evaluation of environmental impacts include environmental justice, employment and economic activity, children's health and safety risks, and transportation resources.

3.7.1 Environmental Justice

EO 12898, *Environmental Justice*, issued in 1994, requires each federal agency to include environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse impacts of its programs, policies, and activities on minority and/or low-income populations. A review of 2010 U.S. Census data was conducted. The ethnic makeup and income characteristics of the City of Tucson and Pima County were examined to establish a baseline of comparison for whether minority or low-income populations are present in the area and could be impacted by the Proposed Action. The project area for the Proposed Action falls entirely within Census tracts 41.14 and 4105.2. Figure 3-3 identifies the Census tracts 41.14 and 4105.2 that surround the project area. Tables 3-4 and 3-5 provide the ethnic profile and poverty status for Census tract 41.14, Census tract 4105.2, the City of Tucson, and Pima County.

Lands immediately adjacent to the Proposed Action are a mix of undeveloped natural desert and active and inactive sand and gravel mines. No residential, commercial, or industrial land uses occur immediately adjacent to the Proposed Action. The closest residential area is located approximately 0.5 mile south of the proposed relocation alignment. The ethnic makeup in both Census tracts is generally representative of the City of Tucson and Pima County, with one exception being the higher percentage of persons of Hispanic or Latino origin. Census tract 41.14 also has a higher percentage of persons living below poverty line, compared with the City of Tucson and Pima County. Taking into account the relatively small population of the Census tract, compared with the City of Tucson and Pima County, there is a much larger margin of error for the income data in the Census tract. Therefore, a comparison cannot accurately be made between the data sets.

Table 3-4. Ethnic Makeup of Census Tract 41.14, Census Tract 4105.2, City of Tucson, and Pima County

Population Characteristics	Census Tract 4105.2	Census Tract 41.14	City of Tucson	Pima County
Total population	6,243	5,424	520,116	980,263
White persons, percent, 2010*	59.7%	63.8%	69.7%	74.3%
Black persons, percent, 2010*	11.1%	0.8%	5.0%	3.5%
American Indian and Alaska Native persons, percent, 2010*	2.4%	1.4%	2.7%	3.3%
Asian persons, percent 2010*	4.4%	0.5%	2.9%	2.6%
Native Hawaiian and Other Pacific Islander, percent, 2010*	0.5%	0.0%	0.2%	0.2%
Persons reporting two or more races, percent, 2010	4.8%	3.3%	4.2%	3.7%
Persons of Hispanic or Latino origin, percent, 2010**	44.3%	79.8%	41.6%	34.6%
White persons not Hispanic, percent, 2010	36.7%	17.2%	47.2%	55.3%

Source: U.S. Census Bureau, 2010 Census.

* Includes persons reporting only one race.

** Hispanics may be of any race, so also are included in applicable race categories.

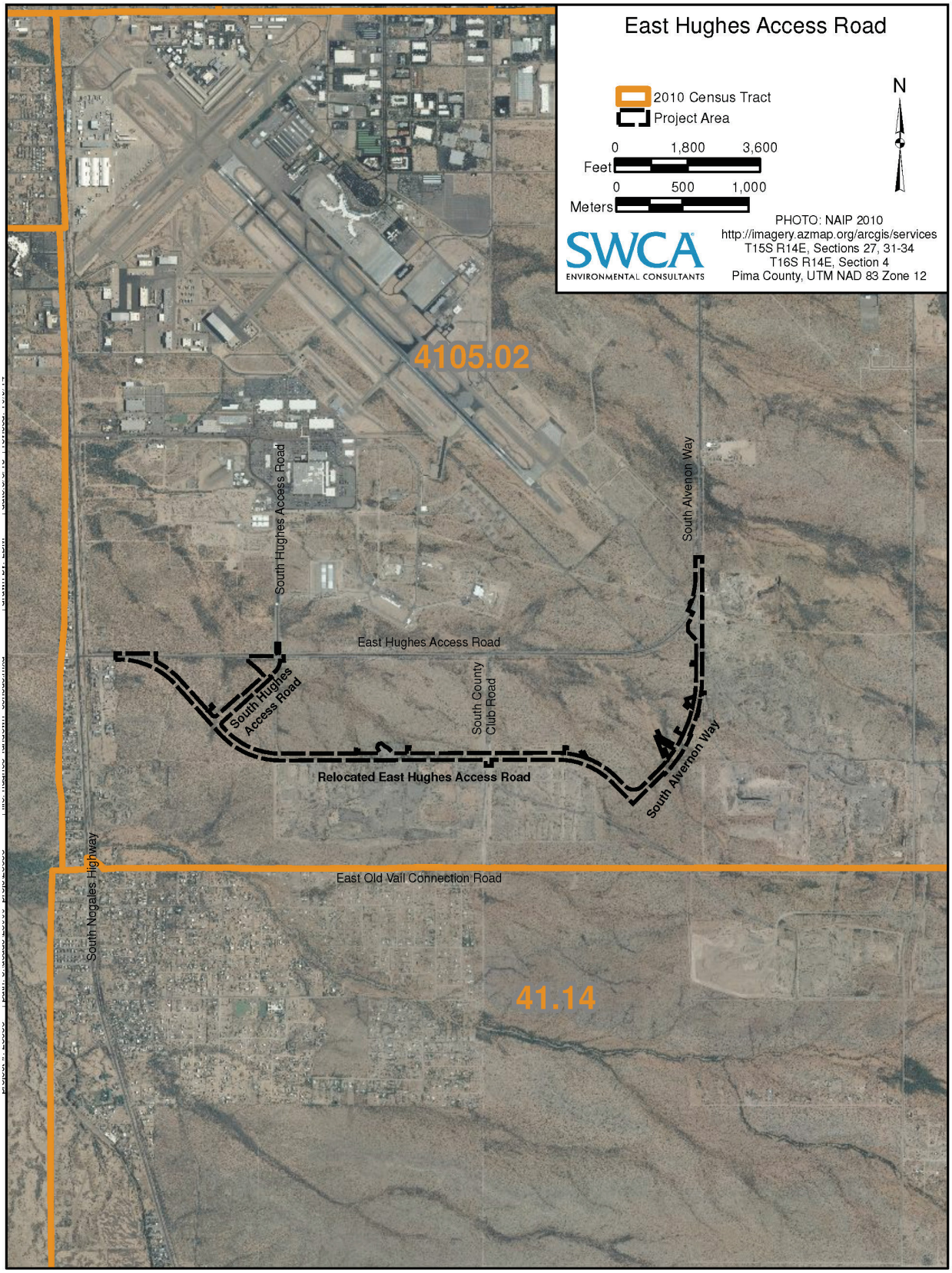

Figure 3-3. Census tracts 41.14 and 4105.2.

Table 3-5. Income Characteristics of Census Tract 41.14, Census tract 4105.2, City of Tucson, and Pima County

Income Characteristics	Census Tract 4105.2	Census Tract 41.14	City of Tucson	Pima County
Per capita income in 2010 inflation adjusted dollars (margin of error)	$20,902 (± $4,376)	$13,261 (± $2,463)	$20,243 (± $264)	$25,093 (± $276)
Median household income in 2010 inflation adjusted dollars (margin of error)	$63,167 (± $10,695)	$38,429 (± $11,031)	$37,025 (± $527)	$45,521 (± $546)
Persons whose income in the past 12 months is below poverty level, percent (margin of error)	9.3% (± 6.0%)	29.4% (± 10.8%)	21.3% (± 0.7%)	16.4% (± 0.5%)

Source: U.S. Census Bureau, 2006–2010 American Community Survey.

3.7.2 Employment and Economic Activity

As of 2013, the primary employers in the Tucson metropolitan area are the University of Arizona (10,846), Raytheon (10,300), Davis-Monthan Air Force Base (9,100), the State of Arizona (8,807), Tucson Unified School District (6,790), Wal-Mart Stores, Inc. (7,450), and Pima County (6,500) (Tucson Regional Economic Opportunities 2014).

Employment and economic activity in the immediate vicinity of the TUS is largely dependent on the aerospace, defense, and logistics industries. The TUS currently employs approximately 300 people at the airport, and approximately 13,000 people are employed by other agencies and business that are located at TUS. Raytheon is Southern Arizona's largest private employer and is located on lands leased from the TAA and the USAF adjacent to the airport. Other existing aerospace and defense industry employers in the vicinity of the project area include Bombardier, Rolls-Royce, and Flight Safety International, Inc. In addition to these private aerospace and defense businesses, the TUS supports the operations of the 162nd Wing of the Air National Guard, which conducts the largest training operation for the F-16 aircraft (TAA 2014a).

Because of the TUS's proximity to rail, interstate highways, and the international border with Mexico, employment in logistics is also prevalent in the vicinity of TUS. The airport is a designated U.S. Port of Entry, with 24-hour Customs and Immigrations services, and is also a designated free trade zone. Two air freight facilities are located at TUS that provide cargo and freight services to the region. In 2013, more than 32,000,000 tons of freight was handled at TUS (TAA 2014b). Currently, three air freight carriers operate out of TUS.

3.7.3 Children's Environmental Health and Safety Risks

There are no residential land uses, daycare centers, preschools or schools located within 1 mile of the proposed relocation alignment. The closest school to the proposed realignment, Summit View Elementary and Head Start, is located 1.15 mile to the south. There are no known children's environmental health and safety risks associated with the Proposed Action site.

3.7.4 Transportation Resources

The TUS is the largest airport in southern Arizona and serves 3.6 million passengers annually, with commercial flights from six airlines. The airport and project area are located in close proximity to Interstate 10 (less than 5 miles to the northeast) and Interstate 19 (2 miles to the west). The existing East Hughes Access Road is categorized by PCDOT as a "major local road," as well as the two roads to which it connects: South Nogales Highway and South Alvernon Way. Because of the proximity to USAF Plant 44 facilities leased by Raytheon and traffic volumes on East Hughes Access Road, Raytheon is operating under multiple waivers issued by the DoD because the road is located within the facilities' safety arc.

3.8 Water Quality

3.8.1 Sole Source Aquifer

The project area is located in the Upper Santa Cruz and Avra Basin sole source aquifer. According to the EPA, "a sole source aquifer is an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally, and economically supply all those that depend on the aquifer for drinking water." The EPA is authorized by Section 1424(e) of the Safe Drinking Water Act of 1974 (Public Law 93-523, 42 U.S.C. 300 *et seq*.) to review proposed projects within a sole source aquifer that are federally funded. As discussed in **Section 2.2** the project is being completely funded by Pima County. The project is being constructed with provisions and measures that would not create affects to the water source, which is further discussed in **Section 4.9**.

3.8.2 Surface Water

The project area is located in the Santa Cruz River valley, which is bounded by the Santa Catalina and Tortolita Mountains on the northeast, the Rincon Mountains on the east, the Santa Rita Mountains on the south, and the Silverbell Mountains on the southwest. In general, the drainage patterns of surface water features in the project area flow in a northwestern direction toward the Santa Cruz River, which is approximately 3.5 miles west of the project area. Four drainage features—Hughes Wash and three unnamed washes—cross the project area at three locations. All four washes are ephemeral and run only during heavy precipitation events. A review of the Federal Emergency Management Agency Flood Insurance Rate Maps (FIRM Nos. 04019C2880L and 04019C2900L) for the project area indicates that the project area is not within a 100-year floodplain. No riparian areas, wetlands, lakes, rivers, or perennial streams exist within the project area.

The U.S. Army Corps of Engineers (USACE) regulates activities involving dredged and fill material within potentially jurisdictional Waters of the U.S. under Section 404 of the federal Clean Water Act (CWA). A preliminary jurisdictional determination has been conducted and approved by the USACE for the proposed project (SPL-2013-00397-MWL). The nearest known reach of navigable-in-fact of the Santa Cruz River is located approximately 14 miles northwest and downstream of the project area. Any future operation or maintenance activities that have the potential to impact a Water of the U.S. would need to comply with the conditions of Sections 401 and 404 of the CWA, based on the potential for impacts to tributaries of navigable Waters of the U.S.

The areas in and around these potentially jurisdictional Waters of the U.S. have the potential to support species protected by the ESA. No Pima pineapple cacti were documented as occurring within 50 feet of any potentially jurisdictional Waters of the U.S. No Sonoran desert tortoises were documented as occurring within the project area. However, tortoises may occur within potentially jurisdictional Waters of the U.S. Lesser long-nosed bats may use xeroriparian areas associated with potentially jurisdictional Waters of the U.S. as movement corridors. One saguaro, a forage plant for lesser long-nosed bats, was documented as occurring within 50 feet of a potentially jurisdictional Water of the U.S. However, this saguaro is too small to flower/fruit and hence provide forage for this bat species.

3.8.3 Groundwater

According to the ADEQ Water Quality Division, the analysis area is located in the Upper Santa Cruz Active Management Area. Several monitoring wells are located on the TUS, USAF, and Pima County properties, with groundwater depths ranging from 109 to 150 feet (ADWR 2013).

3.9 Light Emissions and Visual Impacts

Existing light emissions include lighting from TUS, industrial buildings adjacent to TUS such as Raytheon, roadway lighting along South Nogales Highway and at intersections, and from the residential area 0.5 mile to the south. These emissions are consistent with light emissions from an urban environment.

The existing visual or aesthetic resources of the project range from disturbed lands consistent with adjacent industrial development, the airport, and aggregate mining to undisturbed lands composed of natural desert.

3.10 Natural Resources and Energy Supply

3.10.1 Natural Resources

Hughes Sand and Gravel is currently operating a sand and gravel mining pit that is located adjacent to the east side of South Alvernon Way. A closed materials mining pit is located approximately 2,500 feet south of the existing East Hughes Access Road.

Water supply in the general area is provided by Tucson Water. **Section 3.8** includes additional information about water resources.

3.10.2 Energy Supply

The project area is not located near areas where energy supplies are extracted. Tucson Electric Power provides electricity to the general area, including TUS.

4 Environmental Consequences and Mitigation Measures

4.1 Introduction

The potential for environmental effects resulting from implementation of the Proposed Action and No Action alternatives is presented in this chapter. These alternatives are summarized below and discussed in **Chapter 2, Alternatives**, of this EA.

No Action Alternative – under this alternative the East Hughes Access Road would not be relocated or closed. The roadway would continue to be located within the safety arc used by USAF Plant 44. No land would be sold at fair market value from TAA to Pima County for the proposed road relocation project.

Proposed Action Alternative – The TAA would sell ROW and easements at TUS at fair market value to Pima County for the purpose of relocating the East Hughes Access Road 2,500 feet south of its existing location between the South Nogales Highway and South Alvernon Way.

The analysis of potential effects on environmental resources includes a description of analysis methodology, thresholds of significance, and potential construction and operational impacts.

Potential impacts are discussed in relation to the study area, as defined in **Chapter 3, Affected Environment.** Potential Cumulative Impacts resulting from the incremental effects of the alternatives, when added to the effects of past, present and reasonably foreseeable future actions, are also analyzed. Where necessary, mitigation measures are discussed that would reduce or eliminate anticipated environmental impacts for each of the alternatives. In accordance with guidance provided in FAA Orders 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* (U.S. Department of Transportation 2006a), and 1050.1E, *Environmental Impacts: Policies and Procedures* (U.S. Department of Transportation 2006b), environmental resources not present in the study area would not be affected by the alternatives, and therefore are not discussed within this chapter. The environmental resources not affected by the alternatives include the following: Coastal Resources, Department of Transportation Act, Section 4(f), Farmlands, Floodplains, Noise, Wetlands and Wild and Scenic Rivers.

4.2 Air Quality

4.2.1 No Action Alternative

4.2.1.1 Clean Air Act and National Ambient Air Quality Standards

Traffic on East Hughes Access Road would continue to generate vehicle emissions, and no changes to air quality would occur under the No Action Alternative.

4.2.1.2 Greenhouse Gas Emissions and Climate Change

The No Action Alternative would not increase GHG emissions and would not contribute to climate change.

4.2.2 Proposed Action

4.2.2.1 Clean Air Act and National Ambient Air Quality Standards

The Proposed Action would not affect the number of aircraft operations or passenger enplanements at TUS. Therefore, this section of the EA does not include an analysis of aircraft-related pollutant emissions. The Proposed Action would have temporary, adverse impacts to air quality by emitting criteria pollutants from combustion engines on vehicles and equipment and particulate matter emissions as fugitive dust from ground-disturbing and construction-related activities. Emissions of all criteria

pollutants would result from constructing the relocated road, including combustion of fuels from on-road haul trucks, transporting materials, and employee commuter emissions. Fugitive dust emissions would be greatest during initial site preparation activities and would vary from day to day, depending on the type of activity and prevailing weather conditions. Because the road relocation is not designed to increase traffic capacity of the existing East Hughes Access Road or change airport operations at TUS, emissions from traffic on the relocated road and airport operations at TUS would not increase over current levels.

Pima County commissioned an Air Quality Construction Emissions Inventory analysis to determine whether temporary emissions from construction activities could be significant for any criteria pollutant. The emission inventory analysis is provided in **Appendix C**. The analysis calculated expected criteria pollutant emissions from the types of vehicles and construction equipment that would be used during construction, the types of activities that would occur during an 8-hour workday, and wind conditions that would occur during an 11-month construction period. The calculations used the methodologies outlined in the EPA's *Motor Vehicle Emission Simulator (MOVES2014)* (EPA 2014) and *NONROAD2008 (nonroad, engines, equipment and vehicles) Emission Inventory Model* (EPA 2009b). While the project is anticipated to be completed in 6 months, an 11-month period was used as a conservative approach for the emissions inventory analysis. A significant impact would occur if the construction-related emissions of criteria pollutants would equal or exceed the federal thresholds found in 40 CFR 93.153 or local county significance thresholds found in Pima County Code 17.04.340A.212. The results of the emissions inventory analysis are shown in **Table 4-1** with the applicable federal and Pima County significance thresholds.

Table 4-1. Construction Emissions Inventory Summary

Source	Pollutant Emissions (tons per year)					
	CO	VOC (O_3)	NO_x	SO_x	PM_{10}	$PM_{2.5}$
On-Road Equipment	1.054	0.165	1.185	0.003	0.045	0.049
Non-Road Equipment	0.793	0.164	1.723	0.068	0.182	0.182
Land Development-Earth Moving	0	0	0	0	2.448	1.181
Land Development-Wind Erosion	0	0	0	0	5.422	1.835
Asphalt Paving	0	0.765	0	0	0	0
Total	**1.847**	**1.094**	**2.908**	**0.071**	**8.097**	**3.247**
Pima County Significance Threshold (Pima County Code 17)	100	40	40	40	15	10
Federal Significance Threshold (40 CFR 93.153)	100	50	100	100	100	100
Threshold Exceeded	No	No	No	No	No	No

As shown by the emissions inventory calculations, the proposed construction activities would not exceed Pima County's significance thresholds for NAAQS criteria pollutant emissions and would not require a conformity determination for the SIP. Therefore, the Proposed Action's temporary adverse impacts to air quality would not be significant.

4.2.2.2 Greenhouse Gas Emissions and Climate Change

Emission of GHGs over current levels on the existing alignment of East Hughes Access Road would increase during construction through the use of construction vehicles and equipment. Because the relocation design would not increase traffic capacity from current traffic levels on the existing roadway, GHGs emissions from vehicle traffic on the relocated East Hughes Access Road would not increase over

existing levels. Based on the short-term relatively low-level increase of GHGs during construction, the Proposed Action would not be a significant contributor to climate change.

4.3 Compatible Land Use

4.3.1 No Action Alternative

Under the No Action Alternative, no change in land ownership would occur.

The No Action Alternative would not relocate East Hughes Access Road. Under this alternative, the safety arc at USAF Plant 44 would still overlap the existing East Hughes Access Road. Raytheon, the tenant using USAF Plant 44, must obtain waivers from the USAF to continue to conduct its operations at this facility.

The No Action Alternative would have adverse effects on future land use plans because the alignment of East Hughes Access Road would not be compatible with future land use and economic development plans, including the *2012 TUS Master Plan Update*, the *Pima County Economic Development Plan, 2012 to 2014,* and Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*. These plans specifically identify the need to relocate East Hughes Access Road to meet land use and economic development goals for TAA parcels and the importance of supporting existing industries and promoting aerospace and defense industry development for the Tucson metropolitan region. If East Hughes Access Road were not relocated, other road projects would be needed to provide connectivity to this vacant land. Finally, because of the proximity to Raytheon facilities and traffic volumes on East Hughes Access Road exceeding allowable limits for USAF/Raytheon activities within the safety arc, Raytheon is operating under multiple waivers issued by the DoD. However, if the existing roadway is not relocated outside the safety arc and the waivers expire and are not renewed, these Raytheon operations at USAF Plant 44 may be terminated. Therefore, the No Action Alternative would have significant adverse impacts on future land use.

4.3.2 Proposed Action

The road relocation would require Pima County to dedicate 23.96 acres of County land as ROW, and to acquire, through fee simple acquisitions at fair market value, 51.12 acres of ROW from the TAA and 4.49 acres of ROW from the COT, for a total of 79.57 acres. In addition, approximately 7.55 acres of drainage easements would be required to construct the Proposed Action: 1.51 acres from Pima County and 6.04 acres from the TAA. After East Hughes Access Road is relocated, portions of the existing road that are no longer needed would be abandoned or exchanged for like value, and the rights would be restored to original grantors (TAA, USAF, and COT). Land held by the COT is subject to the TAA master lease and would not be removed from the TUS ALP (2014). No change in land jurisdiction would occur on adjacent lands as a result of the Proposed Action. **Figures 1-4** and **1-5** show the locations where new fee simple ROW acquisitions and drainage easements would be required. **Figure 1-5** also shows the locations where easements would be abandoned. **Table 4-2** summarizes the acreages of ground disturbance, including the fee simple ROW acquisitions and the drainage easements, that would be required.

Table 4.2. Summary of ROW and Drainage Easements Required

Source	Fee Simple ROW (acres)	Drainage Easement (acres)
Pima County	23.96	1.51
TAA	51.12	6.04
COT	4.49	0.0
Total	**79.57**	**7.55**

The Proposed Action would change the project area from undeveloped land to a two-lane roadway and is estimated to permanently impact 106 acres, of which up to approximately 5 acres may be used as material management areas during construction. The proposed project would shift the current traffic from the existing alignment to the new location. In accordance with FAA Order 1050.1E, and 49 U.S.C. 47107(a)(10), a Land Use Assurance Letter has been prepared documenting and supporting TAA's assurance to the FAA that appropriate action, including the adoption of zoning laws, has been or will be taken to the extent reasonable, to promote land use compatibility. A copy of the Land Use Assurance Letter is included in **Appendix D**.

The Proposed Action would have long-term beneficial impacts to existing land use. By relocating East Hughes Access Road, the road would no longer be within the safety arc of the adjacent USAF Plant 44 facilities and would no longer need waivers issued by the DoD to operate within the safety arc. Because waivers would no longer be required, adjacent land use at the USAF Plant 44 facilities would be secure to continue without the threat of the waivers not being issued. The Proposed Action would be consistent with the industrial land uses identified in local land use plans for the TAA, COT, and Pima County.

The Proposed Action would have long-term beneficial impacts to future land use because relocating East Hughes Access Road would meet future land use plans and economic development goals as identified in the *TUS Master Plan Update* and the *Pima County Economic Development Plan, 2012 to 2014*, and Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation*. The *TUS Master Plan Update* identifies the land south of TUS for development of heavy industrial use in order to increase economic development and revenue at the airport. The relocation of East Hughes Access Road would provide better access to the parcels of land identified for heavy industrial use. Economic development objectives for job growth in the *Pima County Economic Development Plan, 2012 to 2014* specifically identify the need to relocate East Hughes Access Road to make the adjacent lands more attractive for future aerospace and defense industry developments. The relocation of East Hughes Access Road would also contribute to economic development by providing Raytheon with the potential to expand their Tucson facilities in the future, should additional space be required. Lastly, Pima County's *Aerospace and Defense Corridor Economic Development Initiative Planning and Implementation* identifies the area south of TUS as the strategic location for the development of aerospace and defense industries and a transportation logistics hub to support these and other regional and international industries. The relocation of East Hughes Access Road would improve access to the parcels identified for future aerospace and defense industry development, making them more attractive to potential developers.

4.4 Fish, Wildlife, and Plants

The project area was investigated in April and November 2013 to ascertain the presence of botanical and vertebrate resources (SWCA 2014a, 2014b). Fish species are not present at the site, as noted in **Section 3.4**, **Fish, Wildlife, and Plants**. Because there are no surface water resources present that could contain fish species that would be affected under either the No Action or Proposed Action alternatives, fish resources were not included in the study.

Native and invasive vegetation and general wildlife species are present in the project area (SWCA 2014a, 2014b). One plant species currently listed as endangered under the ESA was recorded in the project area during surveys. One mammalian species listed as endangered and one reptile listed as a candidate species under the ESA have the potential to occur in the project area. There is no federally designated critical habitat in or adjacent to the project area.

Impacts to wildlife and plants are discussed below.

4.4.1 Vegetation

4.4.1.1 No Action Alternative

No additional impacts over existing conditions would occur to vegetation as a result of the No Action Alternative.

4.4.1.2 Proposed Action

The Proposed Action would result in adverse, direct, short- to long-term impacts to vegetation within the project area because up to approximately 106 acres of vegetation would be cleared to construct the Proposed Action. Protected Arizona Native Plants (Section 3-901 to 3-916 and Article 11) are present within the project area and would be impacted by the project. The Proposed Action, however, includes seeding of approximately 68 acres of disturbed areas with two seed mixes for the first application and approximately 17 acres for the second application, including areas where pavement removal of existing roads would occur. Because protected native plants were found within the project area, Pima County will adhere to the following mitigation measure:

- Protected native plants within the project area will be impacted by this project. Therefore, Pima County will send the notification to ADA at least 60 calendar days prior to the start of construction.

One plant species on the ADA's List of Prohibited, Regulated and Restricted Noxious Weeds (Plant Services Division 2005), buffelgrass, is common within the project area. Therefore, the following mitigation measures are required for this project:

- The contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction consistent with PCDOT's Special Provision 201-3.04, *Noxious and Invasive Vegetation*.
- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity. This would include seeding of approximately 68 acres of disturbed areas with two seed mixes for the first application and approximately 17 acres for the second application,[4] including areas where pavement removal of existing roads would occur.

4.4.2 General Wildlife

4.4.2.1 No Action Alternative

No additional impacts over existing conditions would occur to general wildlife as a result of the No Action Alternative.

4.4.2.2 Proposed Action

General wildlife species were identified during surveys of the project area in April and November 2013 (SWCA 2014a, 2014b). Any wildlife present in the project area could be lost (i.e., crushed, trampled,

[4] Second seeding application will occur close to the end of the project in areas that have not been previously seeded and/or in areas where the first seeding application was not successful.

etc.) or otherwise harmed (i.e., forced to relocate, cut off from other individuals, foraging success decreased, etc.) as a result of the Proposed Action. The adverse impacts to general wildlife from the construction of the Proposed Action and the operation of the relocated roadway would not be significant.

Pima County has incorporated the following mitigation measure into the project design:

- Culverts have been designed consistent with the recommendations to improve wildlife connectivity in the AGFD's study of crossing structure designs that facilitate wildlife movements (AGFD 2011) (see **Appendix A**).

Because general wildlife species were found within the project area, the contractor shall adhere to the following mitigation measure:

- The contractor shall cover trenches, or place escape ramps, at the end of the work day. The contractor shall inspect trenches at beginning of every work day to ensure that no wildlife is trapped within trenches. In the event that wildlife becomes injured or trapped (and cannot be freed), AGFD will be contacted.

4.4.3 Federally Listed Species

4.4.3.1 No Action Alternative

No additional impacts over existing conditions would occur to federally listed species as a result of the No Action Alternative.

4.4.3.2 Proposed Action

The assessment of potential impacts on threatened and endangered species was conducted by identifying species potentially occurring within the project area through biological surveys and identifying potential critical habitat that could potentially be affected by the Proposed Action. One plant species currently listed as endangered under the ESA was recorded in the project area during surveys (SWCA 2014a, 2014b). One mammalian species listed as endangered and one reptile listed as a candidate species under the ESA have the potential to occur in the project area. There is no federally designated critical habitat in or adjacent to the project area.

Under Section 7 of the ESA, as amended, the lead federal agency must consult with the USFWS to ensure that any agency action is not likely to jeopardize the continued existence of any listed endangered or threatened species. Similarly, under the Magnuson-Stevens Act, the lead federal agency must consult with the NMFS regarding any actions that may adversely affect essential fish habitat. FAA Order 1050.1E, Appendix A, Section 8.3 of the Order, also identifies the following threshold for significant impacts on fish, wildlife, and plants: "A significant impact to federally-listed threatened and endangered species would occur when the USFWS or the NMFS determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of federally-designated critical habitat in the affected area."

The Proposed Action will not impact regulated fish species under the jurisdiction of the NMFS because it is on land and does not have any water resources. Therefore, consultation with this agency was not required. The FAA initiated Section 7 ESA Consultation with the USFWS during the preparation of this EA for the lesser long-nosed bat, the Pima pineapple cactus and the Sonoran desert tortoise. The FAA determined that the Proposed Project may affect but is not likely to adversely affect the lesser long-nosed bat, may affect and likely to adversely affect the Pima pineapple cactus, and may impact individual Sonoran desert tortoises but is not likely to result in a trend toward federal listing of loss of viability. Detailed descriptions of the impacts and the determinations for each species is provided below. The FAA's September 5, 2014, Section 7 ESA Consultation letter to the USFWS, and the corresponding biological assessment, is provided in **Appendix E.** The USFWS issued a biological opinion to FAA on November 14, 2014 (see **Appendix E**).

4.4.3.3 Lesser Long-nosed Bat

Measures that would reduce impacts to the lesser long-nosed bat were incorporated into the project design. It is anticipated that the potential material management areas would have minimal impact to saguaros because these areas are disturbed and/or there are very few saguaros growing in these areas. Although these areas have been identified, it is possible that they will not need to be used because the new ROW is expected to be able to accommodate all the necessary equipment and materials. Additionally, the lighting that would be installed at two locations within the project area would use low-voltage, directional lighting. Finally, conservation measures to curb the introduction and spread of buffelgrass, and other invasive plant species, in the project area are proposed.

Construction activities for the road relocation are not likely to result in impacts in the form of mortality or noise impacts to the lesser long-nosed bat because construction activities are most likely to occur during the day, when this species is not present in the project area. Further, impacts to roosts are not anticipated because roosting habitat (i.e., caves, underground mines, crevices, etc.) is not located within the project area or in the project vicinity. Impacts on the lesser long-nosed bat could occur on their habitat as a result of removing forage plants (i.e., approximately 41 saguaros, of which 14 are mature enough to flower/fruit) from the project area to construct the project. The impacts from increased habitat removal, including the removal of wash habitat that provides travel corridors, the addition of lighting, and traffic noise, could result in changes in behavior of lesser long-nosed bats in the project area.

Pima County proposes the following conservation measures to minimize the effects of the proposed project on lesser long-nosed bats:

- Protect in place (including constructing fencing at 11 locations within or along the ROW to minimize or avoid impacts to saguaros), salvage and transplant, or replace all saguaros from the project area to within the adjacent ROW.
    - Salvage or transplant affected saguaros on-site at 1:1 ratio, monitor all transplanted saguaros for 10 years, and if any transplanted saguaros die within the 10-year monitoring period, replace with 4- to 6-foot-tall saguaros at 1:1 ratio.
- Construct temporary fencing at 10 culvert locations where xeroriparian vegetation is associated with potentially jurisdictional Waters of the U.S. to protect and maintain maximum coverage of xeroriparian habitat and reduce impacts to sensitive species such as lesser long-nosed bats.

The FAA has determined the Proposed Action **may affect, is not likely to adversely affect** the lesser long-nosed bat. The USFWS has concurred with FAA's determination in their Biological Opinion, dated November 14, 2014 (see **Appendix E**).

4.4.3.4 Pima Pineapple Cactus

A measure that would reduce impacts to Pima pineapple cacti was incorporated into the project design: the potential material management areas were chosen in soil types that do not provide habitat for Pima pineapple cactus within the project area (or within disturbed areas where no Pima pineapple cactus were found). Although these areas have been identified, it is possible that they will not need to be used because the new ROW is expected to be able to accommodate all the necessary equipment and materials. Finally, conservation measures to curb the introduction and spread of buffelgrass, and other invasive plant species, in the project area are proposed.

Construction activities for the road relocation could result in impacts in the form of mortality of Pima pineapple cacti. Although not a requirement, Pima County will transplant impacted Pima pineapple cacti to the adjacent ROW prior to construction. It is estimated that nine Pima pineapple cacti and approximately 70 acres of Pima pineapple cactus habitat would be impacted. Further, areas of permanent disturbance would remove portions of the seed bank; areas of temporary disturbance could alter the seed

bank; and disturbance of soils would change water infiltration, compact soil, and change local site conditions. Although some areas of temporary disturbance could recover, it may take many years before full recovery is achieved. Recently disturbed areas have an increased potential to be invaded by noxious weeds (e.g., buffelgrass), which can negatively affect Pima pineapple cactus. Finally, any individuals growing in the project area adjacent to the roadway corridor during construction could experience impacts from fugitive dust.

Pima County proposes the following conservation measures to minimize the effects of the proposed project on Pima pineapple cacti:

- Protect in place as many Pima pineapple cacti as possible during construction, including constructing fencing at locations within or along the ROW to minimize or avoid impacts to individuals. Additional fencing will be installed within the ROW and drainage easements to protect additional Pima pineapple cacti, as needed.

Pima County proposes the following conservation measures to compensate for the effects of the proposed project on Pima pineapple cacti:

- Purchase 70 acres of mitigation credits for Pima pineapple cactus at Pima County's Madera Highlands/Elephant Head properties mitigation bank.[5]
- Salvage and transplant all Pima pineapple cacti that cannot be avoided from the project area to within the adjacent ROW and, based on information indicating limited success of transplant efforts on other projects, promote project-specific research into viability of transplanting Pima pineapple cacti.

The FAA has determined the Proposed Action **may affect, is likely to adversely affect** the Pima pineapple cactus. The USFWS has concluded, in their Biological Opinion, dated November 14, 2014, that the Proposed Action, including the conservation measures that were incorporated into the project design, is not likely to jeopardize the continued existence of the Pima pineapple cactus (see **Appendix E**).

4.4.4 Special Status Species

4.4.4.1 No Action Alternative

No additional impacts over existing conditions would occur to special status species as a result of the No Action Alternative.

4.4.4.2 Proposed Action

4.4.4.2.1 Sonoran Desert Tortoise

Based on SWCA's search of the AGFD's HDMS, it was determined that one special status species (also a USFWS candidate species), the Sonoran desert tortoise, has a reasonable potential to occur in the project area (SWCA 2014a, 2014b). Some measures that would reduce impacts to the Sonoran desert tortoise were incorporated into the project design. Drainage improvements will be constructed at 17 locations and have been designed such that they should accommodate movements of tortoises under the new roadway

[5]In March 2006, Pima County Natural Resources, Parks and Recreation completed an agreement with USFWS to establish a new Pima pineapple cacti conservation bank on two properties. These properties are known as Madera Highlands and Elephant Head and total 528.7 acres, of which 494.0 acres were available for future mitigation credits for County-owned projects affecting Pima pineapple cacti. Currently, there are more than 460 one-acre credits available for use, and although the acre credits are not allocated by location, but rather are total credits available for the established bank, the two locations of the two properties are within Pima County. The Madera Highlands site is located 15.5 miles to the south of the unincorporated Three Points area on Highway 286, near milepost 27 at Altar Wash and is approximately 31 miles southwest of the project limits. The Elephant Head site is located 4.5 miles to the east of Interstate 19 near milepost 33 in the unincorporated Canoa Ranch area and is approximately 22 miles south of the project limits.

because they will be of adequate diameter, natural vegetation will be maintained around the culverts, and the slopes and composition of the inlets and outlets are gradual and suitable for tortoises. Finally, conservation measures are proposed to curb the introduction and spread of buffelgrass, and other invasive plant species, in the project area.

Construction activities related to the road relocation could result in impacts to this species, which could alter the behavior of tortoises in the project area or result in injury or death to individual tortoises. Additionally, any individuals present in the project area could experience impacts after the completion of the construction activities because of increased noise associated with the roadway. The removal of habitat, and subsequent construction of roads and power lines or light poles, creates habitat for ravens (*Corvus* spp.), which are known predators of Mojave desert tortoises and possibly Sonoran desert tortoises (USFWS 2010). Further, the roadway corridor, an unvegetated strip, may act as a barrier to movement of individual tortoises. Other known impacts of roads on tortoises include threats of increased litter associated with increased traffic (USFWS 1998; Walde et al. 2007). Fires in the desert are increasing in frequency owing to the invasion of non-native grasses (e.g., buffelgrass) and forbs, which provide levels of fuels not typically found in the desert (Averill-Murray 2000). The relocation of East Hughes Access Road could increase the amount of disturbance in the area and promote the spread of non-native plant species that provide fuels for fire. Fires impact desert tortoises by killing them with lethal heat or low oxygen levels and may indirectly alter their habitat. However, as mentioned above, conservation measures to curb the introduction and spread of buffelgrass, and other invasive plant species, in the project area are proposed.

Pima County proposes the following conservation measures to minimize the effects of the proposed project on Sonoran desert tortoises:

- If any Sonoran desert tortoises are encountered during construction, Pima County shall provide a qualified biological monitor on-site during construction activities to ensure that activities stay within the designated project area, to evaluate the response of individual tortoises that come near the project area, and to ensure implementation of the AGFD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (Revised October 23, 2007).
- The contractor shall cover trenches, or place escape ramps, at the end of the work day. The contractor shall inspect trenches at beginning of every work day to ensure that no tortoises, or other wildlife, are trapped within trenches. In the event that wildlife becomes injured or trapped (and cannot be freed), AGFD will be contacted.
- Prior to the start of construction activities, Pima County shall provide awareness training session to the on-site construction personnel regarding Sonoran desert tortoise.
- If any Sonoran desert tortoises are encountered during construction, the contractor shall contact Pima County environmental staff and adhere to the AGFD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (Revised October 23, 2007).

The FAA has determined the Proposed Action may impact individual Sonoran desert tortoises, but is not likely to result in a trend toward federal listing or loss of viability. The USFWS did not include the Sonoran desert tortoise in their Biological Opinion, dated November 14, 2014 (see **Appendix E**) because this species is a candidate species under the ESA and does not receive regulatory protection under the ESA. However, the USFWS is supportive of any actions the project proponents can take to further the conservation of this species in the project area and recommends complete implementation of the aforementioned conservation measures.

4.4.4.3 State Protected Native Plants

The Proposed Action would result in adverse impacts to vegetation within the project area because vegetation would be cleared to construct the Proposed Action (SWCA 2014a, 2014b). Protected Arizona

Native Plants (Section 3-901 to 3-916 and Article 11) are present within the project area and would be impacted by the project. Therefore, Pima County shall adhere to the following mitigation measure:

- Protected native plants within the project area will be impacted by this project. Therefore, Pima County will send the notification to ADA at least 60 calendar days prior to the start of construction.

With the implementation of this mitigation measure, the Proposed Action's impacts to Protected Arizona Native Plants would not be significant.

4.4.5 Migratory Bird Treaty Act

4.4.5.1 No Action Alternative

No additional impacts over existing conditions would occur to migratory birds as a result of the No Action Alternative.

4.4.5.2 Proposed Action

Because the MBTA of 1918, as amended, provides federal protection to all migratory birds, including nests and eggs, if an active nest is observed during any activities related to the project, measures should be taken to protect the nest from destruction and to avoid a violation of the MBTA. Section 1 of the Interim Empty Nest Policy of the USFWS, Region 2, states that if the nest is completely inactive at the time of destruction or movement, a permit is not required in order to comply with the MBTA. However, unlike the Bald and Golden Eagle Protection Act, there are no specific provisions or permit requirements for non-purposeful take; indeed, the intent of the act is to protect migratory birds from purposeful take and regulate take where warranted.

Bird species protected under the MBTA were identified during surveys of the project area in April and November 2013 (SWCA 2014b). Any bird species protected under the MBTA present in the project area could be forced to relocate as a result of the Proposed Action. With appropriate avoidance measures taken during construction, impacts to bird species protected under the MBTA would not be significant.

4.5 Hazardous Materials, Pollution Prevention, and Solid Waste

4.5.1 No Action Alternative

The No Action Alternative would not have impacts from hazardous materials.

4.5.2 Proposed Action

As stated in **Section 3.5**, the Phase I Environmental Site Assessment that was completed in September 2014 (SWCA 2014d) indicates that no known existing hazardous materials concerns are present within the project area and no lead-based paint was detected on the road striping on East Hughes Access Road. The Phase I Environmental Site Assessment concludes that there is no evidence of RECs in connection with the project area. The illegal trash dump sites with materials that could potentially contain asbestos or lead-based paint are not considered RECs and would be disposed of properly prior to construction.

The construction of the road relocation would require the use of petroleum products and fuels for the construction equipment. These products are stored at contractor maintenance shops and managed in accordance with hazardous materials standard operating procedures. The hazardous and petroleum wastes are recycled or disposed of off-site in accordance with federal, state, and local regulations. All regulatory requirements for handling and storage of fuels, oils, and other hazardous materials (such as the development of spill prevention plans) would be implemented. Wastes generated by the Proposed Action would be properly disposed of off-site. No other hazardous materials would be used at the project site.

Therefore, with the implementation of BMPs, no impacts from hazardous materials would be anticipated as a result of the Proposed Action.

Prior to construction, reasonable efforts should be made to locate, identify, and remove potentially hazardous or contaminated materials and/or solid waste debris, including wildcat dumping within the subject property. Despite these efforts, some of these materials may still be encountered during construction of the project and may include suspected hazardous or contaminated materials and/or solid waste debris buried beneath the surface.

Solid waste created by the project during construction would be properly disposed of offsite at the Los Reales Landfill, approximately 2 miles to northeast of the project area. The amount of solid waste generated by the construction of the relocated road would not be expected to exacerbate the capacity of this landfill. Once constructed and operational, the relocated East Hughes Access Road would not generate additional waste to be disposed of at the Los Reales Landfill.

4.6 Historical, Architectural, Archaeological, and Cultural Resources

4.6.1 No Action Alternative

No historic properties would be affected under the No Action Alternative because no ground-disturbing activities would occur.

4.6.2 Proposed Action

The FAA provided a copy of the documentation, *Cultural Resource Inventory for the Hughes Access Road Relocation Project, Pima County, Arizona* (SWCA 2014c), that it relied on to make its determination of historic properties and finding of effect to the Native American Tribes that requested to be consulting parties on the project and to the SHPO.

The report stated that although there are one archaeological site, two paved roads (South Alvernon Way and East Hughes Access Road), and 12 isolated artifacts or small clusters of artifacts are within the APE, these properties lack attributes that would make them eligible for the NRHP, and thus do not qualify as historic properties as defined in CFR 800.16(l). The FAA determined there are no historic properties listed or eligible for listing in the National Register of Historic Places within the APE. The FAA finds that there are no historic properties affected from the proposed undertaking under 36 CFR § 800.4(d)(1). The Arizona State Historic Preservation Officer concurred with FAA's determination and finding of effect by stamp and signature on FAA's letter on August 29, 2014 (see **Appendix B**).

Concurrently, pursuant to 36 CFR 800.2(c)(2), the FAA invited nine federally recognized Native American groups in Arizona to participate in the Section 106 process: the Ak-Chin Indian Community, Gila River Indian Community, Hopi Tribe, Pascua Yaqui Tribe, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, Tohono O'odham Nation, White Mountain Apache Tribe, and Yavapai-Apache Nation. Three tribes responded to the FAA: the Gila River Indian Community and the Tohono O'odham Nation requested to be consulting parties on the project and the San Carlos Apache Tribe responded that no further consultation on the project was required.

Mitigation Measures:

- If previously unidentified cultural resources are encountered during activity related to the construction of the project, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources. The PCDOT would immediately notify the SHPO, the FAA, the TAA, and the appropriate Native American tribes regarding the finding, its NRHP eligibility, and the effects of the undertaking on the finding.

- If human remains and/or funerary items are found, Arizona Revised Statutes 41-865 and 41-844 require that the Arizona State Museum be notified of the discovery, so that cultural groups who claim cultural or religious affinity to them can make appropriate arrangements for the repatriation and reburial of the remains.

4.7 Socioeconomic Impacts, Environmental Justice, Children's Environmental Health and Safety Risks

4.7.1 No Action Alternative

4.7.1.1 Environmental Justice

No impacts to minority or low-income populations would occur as a result of the No Action Alternative.

4.7.1.2 Employment and Economic Activity

The No Action Alternative would not relocate East Hughes Access Road. Under this alternative, the USAF safety arc used at USAF Plant 44 would still be penetrated by the existing East Hughes Access Road. Raytheon, the tenant using USAF Plant 44, must obtain waivers from the USAF to continue to conduct its operations at this facility. Should the DoD cease issuing waivers for USAF Plant 44's safety arc, Raytheon may terminate operations in Tucson. Because Raytheon is the largest private employer in the Tucson metropolitan area, a significant reduction in current employment levels would result from a Raytheon shutdown. With an average annual salary of $75,000, the economic impact of losing over 10,000 jobs at Raytheon would translate to over a $750,000,000 direct annual loss to the local economy and tax base (Tucson Regional Economic Opportunities 2014). Indirect loss of employment and economic activity would occur to non-Raytheon employees and other businesses that rely on the patronage of Raytheon employees or direct business with Raytheon.

The No Action Alternative would also inhibit future economic activity by restricting the ability of the TAA to develop its land for future aerospace, defense, and logistics industries. Direct effects on TAA revenue would occur as a result of the TAA's inability to effectively develop its land. Indirect effects on TUS revenue would also occur as a result of the opportunity lost of increased use of TUS facilities from adjacent potential aerospace and defense industry development.

The No Action Alternative would constrain Pima County's ability to meet its regional economic development goals of protecting existing jobs at Raytheon, the largest private employer in the Tucson metropolitan area, and improving the potential for new jobs by supporting a possible future expansion of Raytheon and the growth of aerospace and defense industries in this area.

4.7.1.3 Children's Environmental Health and Safety Risks

There are no residential land uses, daycare centers, preschools, or schools within or adjacent to the existing East Hughes Access Road; therefore, the No Action Alternative would not affect children's environmental health and safety risks.

4.7.1.4 Transportation Resources

Under the No Action Alternative, no changes to the existing transportation infrastructure would occur. The DoD would continue to review whether to issue waivers for continued Raytheon operations because East Hughes Access Road would remain within the safety arc of the USAF Plant 44 facilities. TUS operations would not change under the No Action Alternative.

4.7.2 Proposed Action

4.7.2.1 Environmental Justice

No direct or indirect effects to minority or low-income populations would occur as a result of the Proposed Action because the proposed relocation alignment would not occur within or adjacent to any residential areas, and no acquisition or displacement of any residences or businesses would occur. Indirect impacts of the Proposed Action on minority and low-income populations were also considered relative to emissions, water, and surface transportation, which are discussed in separate sections of the EA. The conclusions of the analyses indicate that there would not be any significant impacts on emissions, water, or surface transportation. The closest residential area is approximately 0.5 mile south of the proposed relocation alignment. The proposed relocated East Hughes Access Road will not create disproportionate high and adverse impacts to low income and minority populations.

4.7.2.2 Employment and Economic Activity

The Proposed Action would have significant long-term beneficial impacts to employment and economic activity because the Proposed Action would protect existing employment at Raytheon and would promote job growth by supporting the TAA's and Pima County's economic development goals. The Proposed Action would protect employment at Raytheon by relocating the road outside the safety arc of the adjacent USAF Plant 44 facilities. Because the relocated road would no longer be in conflict with DoD requirements, the existing Raytheon facilities would be secure from being required to shut down operations altogether, should the DoD ever decide to not issue the waivers. Furthermore, relocating the road further away from Raytheon would provide additional space for potential Raytheon expansion.

Regional economic development, in general, increases air traffic, air cargo, and revenue at TUS, and the relocation of East Hughes Access Road would support regional economic development on lands under authorization of the TAA immediately adjacent to the TUS for industries that use TUS facilities. TUS revenue would potentially increase from the lease of TAA-owned lands. The increased use of TAA land and TUS facilities would generate more revenue for the airport to pursue facility improvements and future expansion opportunities.

4.7.2.3 Children's Environmental Health and Safety Risks

There are no residential land uses, daycare centers, preschools, or schools within or adjacent to the existing East Hughes Access Road; therefore, the Proposed Action would not affect children's environmental health and safety risks.

4.7.2.4 Transportation Resources

The Proposed Action would not have an effect on transportation resources because the relocated road would not increase traffic capacity above current levels, and access to adjacent lands would remain open during construction. The DoD would no longer be required to issue waivers for East Hughes Access Road because the road would be closed to public access after the construction of the relocated road is completed. Because the relocated road would not be required to obtain waivers from the DoD, this would be considered a direct, long-term, beneficial impact. The Proposed Action would not have an effect on airport operations at TUS.

4.8 Water Quality

4.8.1 No Action Alternative

The No Action Alternative would not have impacts to the Upper Santa Cruz and Avra Basin sole source aquifer, surface water resources, or groundwater resources.

4.8.2 Proposed Action

4.8.2.1 Sole Source Aquifer

Based on the depth of groundwater in the project area (109 to 150 feet), the limited depth of ground-disturbing activities during construction to relocate the road would not reach groundwater levels. Therefore, no impacts to the Upper Santa Cruz and Avra Basin sole source aquifer would be anticipated.

4.8.2.2 Surface Water

Short-term, direct, adverse impacts would occur to surface waters and Waters of the U.S. from the construction of the Proposed Action, which could cause the deposition of fill materials or increased sedimentation into the washes or drainage features during construction. This impact would occur where the road relocation crosses the four identified washes and requires the installation of drainage crossing structures that help maintain the integrity of the roadways during storm events. However, installation of the drainage structures would be conducted in a manner that has minimal impacts on surface waters to the maximum extent practical. Erosion-control BMPs would be adopted to maintain runoff on-site and would minimize the potential for adverse effects on downstream water quality. With the installation of the drainage structures and the implementation of BMPs, the impacts to surface waters would not be significant.

An estimated total of 0.113 acre of permanent impacts to Waters of the U.S. would be expected due to the installation of four drainage structures at four separate and complete projects/crossings, and an estimated total of 0.019 acre of temporary impacts would be expected due to temporary construction access. Drainage improvements will be constructed at 17 locations: 15 crossings with reinforced concrete pipe culverts (RCPCs) ranging in size from 24 to 36 inches in diameter and 91 to 302 feet long; and two reinforced concrete box culverts (RCBCs) ranging in size from 8 feet by 5 or 6 feet and 95 to 110 feet long. Several drainage structures will also have drop inlets and rip-rap lined outlets. No riparian habitat that would be considered eligible for federal protection occurs within the project area. A Nationwide Permit 14 (linear transportation projects) preconstruction notification was submitted to the USACE on April 22, 2014, requesting either a permit verification letter or a written response that a non-notifying nationwide permit is sufficient for this project and that no additional in-lieu fees are required because there would be no impacts to mature flowering/fruiting saguaros (i.e., lesser long-nosed bat forage plants) or Pima pineapple cactus within 50 feet of jurisdictional waters. On June 13, 2014, the USACE issued a Nationwide Permit Verification letter (File Number: SPL-2013-00397-DB) to the PCDOT stating that the construction of the proposed project complies with Nationwide Permit 14, provided the construction is conducted as described in the permit application (**Appendix F**). Other pertinent federal, state, and local permits would be obtained for any temporary construction activities and the installation of any permanent infrastructure that would occur in jurisdictional drainages.

The areas in and around these potentially jurisdictional Waters of the U.S. have the potential to support species protected by the ESA. Although no Sonoran desert tortoises were documented as occurring within the project area, they may occur within potentially jurisdictional Waters of the U.S. Pima County is proposing species-specific conservation measures for the tortoise (see **Section 4.4, Fish, Wildlife, and Plants,** for details) and has designed culverts for this project that are consistent with the recommendations to improve wildlife connectivity in the AGFD's study of crossing structure designs that facility wildlife movements (AGFD 2011) (see SWCA 2014a for details). Lesser long-nosed bats may use xeroriparian areas associated with potentially jurisdictional Waters of the U.S. as movement corridors. However, fencing will be constructed at 10 culvert locations to protect xeroriparian vegetation associated with potentially jurisdictional Waters of the U.S. to maintain maximum coverage of xeroriparian habitat and reduce impacts to sensitive species such as lesser long-nosed bats, which may use potentially jurisdictional Waters of the U.S. One saguaro, a forage plant for lesser long-nosed bats, was documented

as occurring within 50 feet of a potentially jurisdictional Waters of the U.S. However, this saguaro was too small to flower/fruit and hence provide forage for this bat species.

The Proposed Action would be designed in accordance with proven design standards for roadway drainages. Implementation of BMPs to maintain runoff on-site and minimize erosion during construction activities would minimize the potential for adverse effects on downstream water quality. These BMPs would be identified in a SWPPP that would be prepared and implemented in order for the project to comply with the current Arizona Pollutant Discharge Elimination System Stormwater Construction General Permit (AZG2013-001). The SWPPP would implement construction of permanent and temporary stormwater pollution prevention measures, source control, preservation of natural drainage patterns, runoff treatment, flow control, protection to Waters of the U.S., and details on operation and maintenance of these control measures for associated conveyance. Stages of implementation of the SWPPP would be:

- conduct initial staking and marking to identify the areas for construction;
- fence protected/sensitive areas;
- remove incipient vegetation and install temporary erosion controls;
- clear and grub deleterious materials;
- install structural erosion control measures;
- conduct on-site earthwork;[6]
- stabilize, compact, and/or distribute earth and install any temporary erosion control measures;
- install utilities and cross drainage and any associated post construction erosion control measures;
- complete final grading and install permanent seeding and plantings;
- complete final paving; and
- remove any remaining temporary erosion control measures.

Mitigation Measures

- Contractor shall follow Section 401 general conditions and Section 404 Nationwide Permit 14 permit, general, and regional conditions.
- Prepare and implement a SWPPP prior to applicable activities. Implement BMPs described in the SWPPP to reduce erosion. Consider areas with highly erodible soils when planning the activities and incorporate measures such as waddles, aggregate materials, and wetting compounds in the erosion-control BMPs.
- All contractors and personnel will review the PCDOT-approved spill protection plan and implement it during project activities.
- Cease work during heavy rains and do not resume work until conditions are suitable for the movement of equipment and materials.
- Rip-rap should be placed on a layer of geotextile fabric to prevent underlying sediment from being washed out through the openings of the rip-rap.
- Rip-rap should be keyed into the wash/streambed to ensure its stability and effectiveness.

[6] Including, but not exclusively limited to, rough grading, excavation, placement of embankments for roads, channels, bridges, and driveways to match horizontal and vertical elevations.

4.8.2.3 Groundwater

Based on the groundwater level at 109 to 180 feet below ground surface in the project area and the Proposed Action's maximum depth of ground disturbance of 9 feet, groundwater resources would not be impacted by the Proposed Action. No wells would be impacted by the Proposed Action.

4.9 Lighting Emissions and Visual Impacts

4.9.1 No Action Alternative

Under the No Action Alternative, no increases in lighting emissions or visual impacts would occur.

4.9.2 Proposed Action

Alternative 1 – Proposed Action would include the use of low voltage overhead roadway lighting at the intersections of East Hughes Access Road with South Hughes Access Road and South Alvernon Way. The overhead roadway lighting would use shielding to direct light downward toward the road and minimize light going toward the sky. The addition of the overhead roadway lighting would be consistent with the surrounding areas and would not contribute to a significant increase of light emissions. Potential light emission impacts on biological resources are discussed in **Section 4.4**.

The construction of Alternative 1 – Proposed Action would change undeveloped desert land into a two-lane road. In the context of the surrounding visual landscape of TUS and associated industrial facilities, retired and operating materials mining pits, and other roads such as South Nogales Highway and South Alvernon Way, the new road would not be considered a significant change from existing visual and aesthetic conditions.

4.10 Natural Resources and Energy Supply

4.10.1 Overview

Under the No Action Alternative, existing utilities would not be relocated, and there would be no disruption to any services on or off airport property. In addition, there would be no differences in the effects on energy supply or natural resources because no construction activity would occur. Therefore, there would be no adverse effects on natural resources or energy supply under the No Action Alternative.

The commitment of resources for the Proposed Action includes significant labor, which is generally non-renewable and irretrievable. The construction of, and travel to and from, the proposed project site would require the consumption of petroleum products and petroleum-based electrical generation provided by the local power company. The Proposed Action Alternative would not increase the amount of nighttime lighting within the study area because the low-voltage down-facing lights would be over the intersections and not along the length of the relocated East Hughes Access Road. There would be no significant light emissions impacts as a result of the Proposed Action.

Under the Proposed Action, the construction of the relocated East Hughes Access Road would necessitate the usage of electricity, water, and other natural resources. However, because the relocated road would not require the continued use of energy and natural resources after its construction beyond the lighted intersections, there would be no long-term operational impacts on natural resources or energy supply. This long-term situation would be similar to the No Action Alternative.

4.10.2 Thresholds of Significance.

FAA Order 1050.1E, Section 13.2b, does not identify specific impact thresholds for energy and natural resources. For this EA, impacts on energy supply and natural resources would be considered significant if the implementation of the Proposed Action would:

- Require or result in construction of new electrical power or transmission facilities or expansion of existing facilities, which would cause significant environmental effects;
- Result in a statistically significant increase in fuel consumption caused by changes in aircraft or ground vehicle use;
- Encourage activities that result in the use of large amounts of fuel, water, or energy in a wasteful manner;
- Result in a substantial use of natural resources that are in short supply; or
- Not include facility improvements that promote renewable energy or consumption, where feasible.

4.10.3 Comparison of the No Action and Proposed Action Alternatives

4.10.3.1 No Action Alternative

Under the No Action Alternative, relocation of the East Hughes Access Road would not occur. Therefore, the No Action Alternative would not use or impact natural resources and minerals that are unusual in nature or are in short supply.

4.10.3.2 Proposed Action

The Proposed Action would require the consumption of natural resources and energy to construct and operate. Energy in the form of electricity, gasoline, and diesel fuel would be consumed during construction of the Proposed Action. In addition, Pima County would use water, sand, and gravel in the construction process. However, sufficient supply exists to meet the construction demands, and thus use of natural resources that are in short supply is not anticipated.

Construction of the Proposed Action would involve grading and asphalt pavement to achieve the appropriate gradient and surface treatment for the relocated East Hughes Access Road. Upon completion of the Proposed Action, the only natural resources that would be consumed are electricity for the intersection street lighting, and gasoline and diesel for the vehicles that use the road. Lighting demand is expected to be minimal, and the existing electrical supplier would be able to meet the demand.

The Proposed Action would require the consumption of natural resources and energy supply during construction and operation. However, sufficient supply exist to meet the project demands, and the use of natural resources in short supply is not anticipated. Therefore, the Proposed Action Alternative would not have a significant impact on natural resources or energy supply.

4.11 Secondary (Induced) Impacts

Proposed projects often involve the potential for induced or secondary impacts on surrounding communities. Examples of induced or secondary impacts include shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity.

4.11.1 No Action Alternative

No immediate shifts in patterns of population movement and growth and public service demands would occur under the No Action Alternative because lands adjacent to the relocated East Hughes Access Road

would remain undeveloped. As stated in **Section 4.7** above, there would be significant changes in business and economic activity under the No Action Alternative because of potential employment loss at Raytheon, indirect business and employment loss at businesses that rely on Raytheon and its employees, and the inability to fully develop aerospace and defense industries on TUS properties. If the DoD stopped issuing waivers for East Hughes Access Road and Raytheon closed, a shift in populations would potentially occur as the 10,000 employees and other indirectly unemployed workers either relocate to other Raytheon facilities out of state or search for employment opportunities elsewhere.

4.11.2 Proposed Action

The Proposed Action would not cause an immediate shift in patterns or population and growth and public service demands because no specific development plans are proposed for lands adjacent to the road relocation. As stated in **Section 4.7** above, there would be significant changes in employment and economic activity under the Proposed Action because of the security the project would bring to the continued presence of Raytheon and its employees and the potential for the relocated road to make the adjacent parcels more conducive to development by aerospace and defense industry businesses. Should the road relocation project contribute to development of the TUS properties and expansion of Raytheon in the future, the Proposed Action would contribute to a potential increase in population growth and changes in business and economic activity. Increased economic activity caused by new and/or expanded aerospace and defense industry businesses on adjacent lands would lead to the creation of more jobs, which, in turn, would lead to more people relocating to the Tucson region. With population growth and increased economic activity, demands for public services such as police and fire response services would also increase. Based on the higher-income salaries typical of aerospace and defense industries, the increase in the tax base from the new businesses and employees would likely more than offset the increased demand for these public services.

4.12 Construction Impacts

4.12.1 No Action Alternative

No construction activities would occur under the No Action Alternative. Therefore, no construction-related impacts would occur as a result of the No Action Alternative.

4.12.2 Proposed Action

The Proposed Action's construction activities would impact air quality, water resources, and transportation resources. These impacts and mitigation measures for these impacts are disclosed in their respective sections.

The Proposed Action would take approximately 6 months to construct and is anticipated to commence in spring 2015. In accordance with Pima County's Noise Ordinance, construction activities are permissible between 5:00 A.M. and 7:00 P.M on weekdays and between 6:00 A.M. and 7:00 P.M. on weekends and holidays. A detailed description of construction activities is provided in **Section 2.6**. Prior to construction activities, the PCDOT would be required to file an FAA form 7460-1, *Notice of Proposed Construction or Alteration*. Construction would not be allowed to begin until the FAA has determined that the proposed roadway relocation and the construction equipment do not conflict with 14 CFR Part 77 Imaginary Surfaces.

Noise would be generated from the operation of heavy construction equipment. However, the project area is not close to any sensitive noise receivers such as residential neighborhoods, schools, or parks. The closest residential area to the project area is ¾ mile south of the proposed relocation. Because construction would occur during the daytime on weekdays and far from sensitive noise receivers, no noise impacts associated with construction activities would occur.

Depth of excavation during construction would not be greater than 9 feet. Due to the topography, the project would be a net borrow operation, meaning that fill material from offsite would be required to construct the relocated road. Borrow sources and waste locations would be determined by the selected construction contractor and must conform to all environmental regulations.

4.13 Cumulative Impacts

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future activities. For foreseeable future actions relative to this EA, consideration was given to cumulative impacts of other TUS activities and known future construction projects for which plans have been submitted to permitting agencies. Projects that occur beyond 1 mile of the project area would not be expected to contribute to a cumulative impact and are generally not evaluated further.

4.13.1 Past Actions

Past actions that have occurred within the past 5 years in the project area have included the TAA's treatment of buffelgrass with herbicide in 2013 and 2014 within TAA parcels. This action has had beneficial, site-specific, direct impacts because it has been removing an invasive plant species. The TAA also proposed a runway extension project at TUS, but the project was terminated in 2010 to permit the TAA to evaluate future needs. There have been no other significant public or private developments within the past 5 years within 1 mile of the Proposed Action.

4.13.2 Present Actions

No other projects are currently occurring in the project area.

4.13.3 Reasonably Foreseeable Future Actions

The TAA has a few reasonably foreseeable future actions planned that are expected to occur in the next 5 years near the project area. The TAA is scheduled to continue to treat buffelgrass with herbicide on TAA and COT parcels in summer 2015. This reasonably foreseeable future action would continue to have beneficial, site-specific, direct impacts because it has been removing an invasive plant species. In addition, TAA actions may include the disposal of non-aeronautical lands to the USAF; the USAF would use this land primarily for safety buffer against existing USAF operations, but the buffer land would not contribute to increased industrial activity at Plant 44. This reasonably foreseeable future action would have no effect because the land would continue to be open space, and future development on that land would be subject to NEPA analysis. The TAA is considering a proposed new runway at TUS and land acquisition project. However, the TAA is still conducting planning efforts for the proposed runway project and it is not yet ready to present to FAA for review. These projects would be the subject of an Environmental Impact Statement prepared by the FAA when the proposals are officially submitted to the FAA. Changes to roadway traffic levels may occur should development occur on adjacent properties. However, any future projects to address roadway capacity would require separate environmental review actions. Any development of adjacent properties on TAA land would also be subject to separate environmental evaluations, if required. Finally, the TAA anticipates actively marketing non-aeronautical land surrounding the project area for industrial development in the next 5 years. The TUS would benefit from this marketing effort and the potential for the airport to receive additional revenue from businesses that would use airport services.

5 Coordination and Public Involvement

Agency and public involvement in the NEPA process promotes open communication between the public and the government and enhances the ability of the FAA to make an informed decision. NEPA and implementing regulations and procedures from the CEQ direct agencies to make their EAs and Environmental Impact Statements available to the public during the decision-making process, before actions are taken. The premise of NEPA is that the quality of federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process.

5.1 Public and Agency Scoping

The public involvement process provides the FAA with the opportunity to cooperate with and consider state and local views in its decision whether to approve the TUS ALP change and the release of land for the sale of ROW on TAA property and its determination of the Proposed Action's effects on the safe and efficient use of airspace. The PCDOT initiated public involvement for this project by notifying relevant federal, state, and local agencies, and private property owners of the Proposed Action in scoping letters that were distributed on October 29, 2013, and followed by a 30-day comment period. The scoping letters provided information regarding the Proposed Action and requested input on environmental or other concerns they might have regarding the Proposed Action. Additionally, a website for the project was created to provide information to the general public.[7] Based on the comments received, no issues were identified beyond those that are analyzed in detail in this EA. A list of adjacent landowners and agencies that received scoping letters, comments received, and PCDOT responses to the comments received are identified in **Table 5-1**.

Table 5-1. October 2013 Public and Agency Scoping

	Date Contacted	Method of Notification	Comment	Response
Agency Scoping				
AGFD	10/29/2013	Letter	11/01/2013 letter (**Appendix G**): Recommended contacting USFWS for details on effects on endangered or threatened species and their habitat.	None required.
USFWS	8/22/2013; 10/29/2013	Meeting (8/22/2013); Letter (10/29/2013)	8/22/2013 email (see **Appendix G**): Requested several items be included in BA.	None required.
Tohono O'odham Nation	10/29/2013	Letter	No response received	None required
Pima County				
Regional Flood Control District	10/29/2013	Letter	No response received	None required
Sheriff's Department, San Xavier District	10/29/2013	Letter	No response received	None required
PCNRPR	10/29/2013	Letter	10/31/2013 email: Department concurs that the trails can be easily integrated into the realignment project.	None required.

[7] Available at: http://webcms.pima.gov/cms/One.aspx?portalId=169&pageId=82079.

Table 5-1. October 2013 Public and Agency Scoping (Continued)

	Date contacted	Method of notification	Comment	Response
Real Property	10/29/2013	Letter	No response received	None required
COT				
Department of Transportation	10/29/2013	Letter	No response received	None required
Police Department	10/29/2013	Letter	No response received	None required
Fire Department	10/29/2013	Letter	No response received	None required
Real Estate Program	10/29/2013	Letter	No response received	None required
Sunnyside School District	10/29/2013	Letter	No response received	None required
SunTran	10/29/2013	Letter	No response received	None required
Rural Metro Fire	10/29/2013	Letter	No response received	None required
University Medical Center-South Campus	10/29/2013	Letter	No response received	None required
USAF	10/29/2013	Letter	11/27/2013 email: Question regarding the timing of the project and accommodating future USAF land use plans with the location of the entrance road to Raytheon.	11/27/2013 PCDOT email response: PCDOT is aware of future USAF land use plans and is coordinating with Raytheon. The project is unable to alter the entrance road to accommodate USAF land use plans at this time, but the project is being designed to minimize the scope of work that will be required to realign the entrance road in the future.
Air National Guard	10/29/2013	Letter	No response received	None required
U.S. Customs and Border Patrol	10/29/2013	Letter	No response received	None required
Public Scoping/Coordination				
Six adjacent businesses contacted	10/29/2013	Letter	11/18/2013 Arizona Recycles phone call: Question regarding whether the project would require ROW acquisition from adjacent private property. 01/13/2014 The Ashton Company, Inc., email: Question regarding whether the project would impacts access to their business.	11/18/2013 PCDOT phone response: The project would not require ROW acquisition from adjacent private property. 01/13/2014 PCDOT phone response: The project would include relocation of driveway on South Alvernon Way for access road to existing businesses southeast of existing driveway location.
One adjacent private landowner contacted	10/29/2013	Letter	No response received	None required

5.2 Draft EA and Notice of Availability

The FAA will continue to coordinate with Pima County and the TAA, and the Draft EA will be available to agencies previously scoped as listed in **Table 5-1**. Public involvement will continue with the publication of this EA and 30-day public comment period which will end December 30, 2014. Comments from the public and federal, state, and local agencies will be incorporated into the Final EA and included in an appendix. The Notice of Availability for the Draft EA will be published in the *Arizona Daily Star* and *The Daily Territorial*. Hard copies of the Draft EA will be available at the following locations:

Joel D. Valdez Main Library,
101 North Stone Avenue
Tucson, Arizona 85701

Tucson International Airport Administrative Offices
7005 South Plumer Avenue
Tucson, Arizona 85756

FAA Phoenix Airports District Office
3800 N Central Avenue, Suite 1025,
Phoenix, Arizona 85012

FAA Western Pacific-Region Office
Office of the Airports Division
15000 Aviation Boulevard
Hawthorne, California 90261

6 List of Preparers

The following is a list of agencies, organizations and persons who contributed in the preparation of this Draft EA for the Proposed East Hughes Access Road Relocation project:

6.1 Tucson International Airport/Tucson Airport Authority

Jordan Feld, AICP
Director of Planning and Economic Development

Responsibilities – Review and coordination with Western-Pacific Region Airports Division

Eric Roudebush, P.E.
Director of Environmental Services

Responsibilities – Review and coordination with Western-Pacific Region Airports Division

6.2 Pima County

Dean Papajohn, P.E.
Civil Engineering Manager, PCDOT

Karla Reeve-Wise
Environmental Compliance Officer, Pima County Department of Environmental Quality

Roger Anyon
Office of Sustainability and Conservation, Cultural Resources and Historic Preservation Division

Ursula Nelson
Director, Pima County Department of Environmental Quality

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Deputy Director, Pima County Department of Environmental Quality

John Moffatt
Director, Strategic Planning Office

6.3 SWCA Environmental Consultants

Angela Barclay, M.S.
Project Manager/Senior Natural Resources Specialist

Jonathan Rigg, M.A.
Environmental Planner

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Geographic Information System Specialist

Chris Query, M.A.
Geographic Information System Specialist

Heidi Orcutt-Gachiri, Ph.D.
Technical Editor

6.4 Principal Federal Aviation Administration Reviewers:

David B. Kessler, AICP
Regional Environmental Protection Specialist, Western-Pacific Region, Airports Division

Qualifications – M.A. Physical Geography, B.A. Physical Geography (Geology minor). Mr. Kessler has 33 years of experience. Principal FAA Planner/Environmental Protection Specialist responsible for detailed FAA evaluation of Environmental Assessments and Environmental Impact Statements as well as coordination of comments from federal and state agencies in the FAA's Western-Pacific Region.

Responsibilities – Detailed evaluation and review of document for compliance with NEPA

Peter F. Ciesla
Regional Environmental Protection Specialist, Western-Pacific Region, Airports Division.

Qualifications – M.B.A Finance, B.S. Accounting. Mr. Ciesla has over 20 years of environmental compliance experience.

Responsibilities – NEPA review and regulatory agency consultations.

7 List of Abbreviations and Acronyms

Note: All abbreviations cited in this document are listed in alphabetical order.

ACCRI	Aviation Climate Change Research Initiative
ADA	Arizona Department of Agriculture
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AFMAN	Air Force Manual
AGFD	Arizona Game and Fish Department
ALP	Airport Layout Plan
APE	area of potential effects
AZHGIS	Arizona Heritage Geographic Information System
BMPs	best management practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
COT	City of Tucson
CWA	Clean Water Act
DoD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EOs	executive orders
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FR	Federal Register
GAO	Government Accountability Office

GHG	greenhouse gas
HDMS	Heritage Data Management System
ICAO	International Civil Aviation Organization
LMP	Limited Maintenance Plan
MBTA	Migratory Bird Treaty Act of 1918, as amended
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NO_2	nitrogen dioxide
NRHP	National Register of Historic Places
O_3	ozone
PARTNER	Partnership for AiR Transportation Noise & Emissions Reduction
Pb	lead
PCDOT	Pima County Department of Transportation
PCNRPR	Pima County Natural Resources, Parks and Recreation
$PM_{2.5}$	particulate matter, less than 2.5 microns
PM_{10}	particulate matter, less than 10 microns
RECs	recognized environmental conditions
RCBCs	reinforced concrete box culverts
RCPCs	reinforced concrete pipe culverts
ROW	right-of-way
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SWCA	SWCA Environmental Consultants

SWPPP	Stormwater Pollution Prevention Plan
TAA	Tucson Airport Authority
TUS	Tucson International Airport
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
Western	Western Area Power Administration

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APPENDIX A

Drainage Improvements

E. HUGHES ACCESS ROAD
DRAINAGE STRUCTURES
Legend
Proposed Roadway
Riprap Channel
Drainage Features
Jurisdictional Delineation
N
1"=1000'
S. Nogales Highway
S. Access Rd.
S. Alvernon Way
UPRR
Existing E. Hughes Access Rd.
Proposed Hughes Access Rd.
S. Country Club Rd.
Culvert #1
1-36" RCP
Culvert #2
4-24" RCP
Culvert #3
3-36" RCP
Culvert #4
2-24" RCP
Culvert #5
2-24" RCP
Culvert #6
1-24" RCP
Culvert #7
1-24" RCP
Culvert #8
2-30" RCP
Culvert #9
2-8'x6' RCBC
Culvert #10
2-8'x5' RCBC
Culvert #11
3-36" RCP
Culvert #12
6-36" RCP
Culvert #13
2-36" RCP
Culvert #14
2-36" RCP
Culvert #15
1-24" RCP
Culvert #22
6-36" RCP
Culvert #23
4-36" RCP

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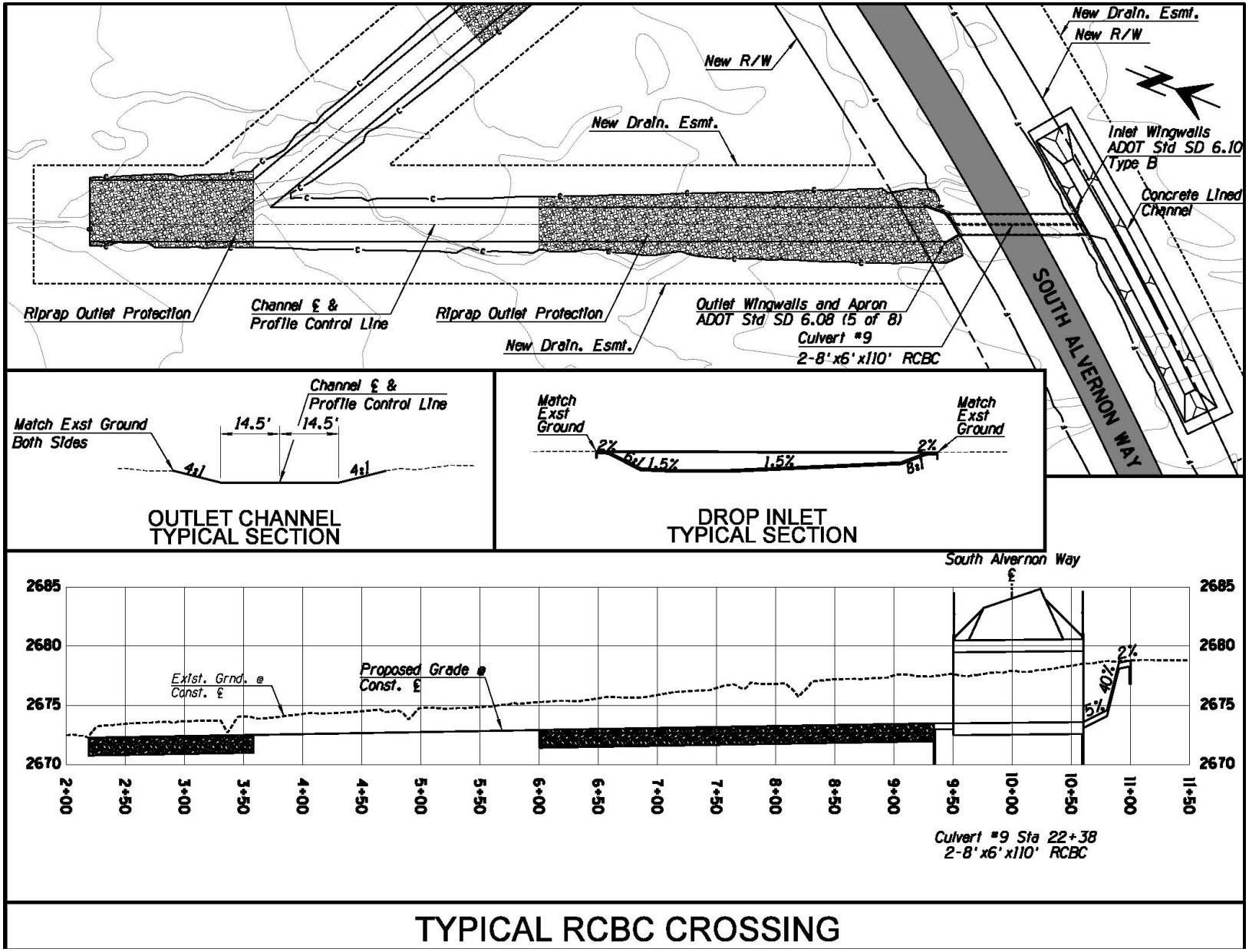
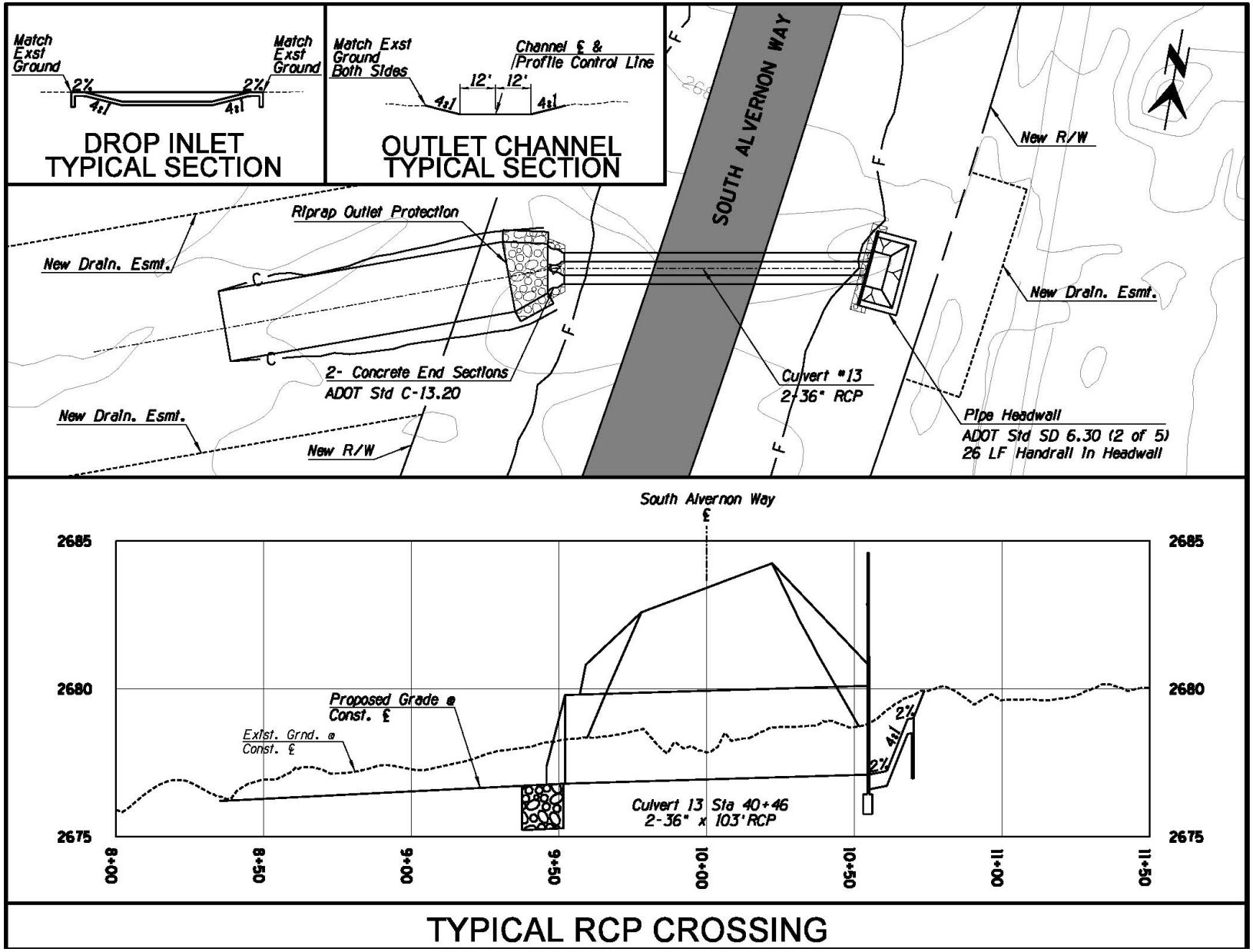


TYPICAL RCBC CROSSING



TYPICAL RCP CROSSING

APPENDIX B

Section 106 Consultation

2014-0416 (119324)

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

RECEIVED
APR 21 2014
ARIZONA STATE HISTORIC
PRESERVATION OFFICE

April 17, 2014

Mr. James Garrison
State of California
Arizona State Parks
1300 W. Washington Street
Phoenix, Arizona 85007

Attention: Mr. David Jacobs

Dear Mr. Garrison:

**Proposed Hughes Access Road Relocation,
Tucson International Airport
Tucson, Pima County, Arizona
Section 106 Coordination**

The Tucson Airport Authority (TAA) and the Federal Aviation Administration (FAA) are preparing federal environmental documentation under the National Environmental Policy Act (NEPA) of 1969 as amended, for the proposed release of TAA land to Pima County, to be used to relocate a segment of Hughes Access Road as shown in the enclosed project location map, Figure 1. Pima County is proposing to relocate the existing paved two-lane, undivided section of Hughes Access Road immediately south of Tucson International Airport from just east of South Old Nogales Highway to South Alveron Way. The proposed project would construct a new two-lane section of Hughes Access Road, approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor. The Federal Action for this project is the release of right-of-way for the segment of the project on TAA land, which is an approximate three mile portion of the roadway as shown in Figure 2.

Background and Area of Potential Effect

Although the undertaking, the segment of the roadway subject to FAA approval is approximately 3 miles of the total 3.9 mile relocated roadway, the FAA is evaluating the entire roadway segment in the NEPA Environmental Assessment. The FAA is providing the following information on how FAA determined the boundaries of the Area of Potential Effects (APE) for the entire proposed length of the relocated roadway. FAA has identified the APE for direct effects to cultural resources as: an area of 106 acres comprising the new road right-of-way, areas of existing road right-of- way required for project construction, areas where the abandoned road would be removed, material management (staging) areas, vegetation transplant areas, areas where utilities would be

2

relocated, areas necessary for the construction of new drainage structures, and any other areas of ground disturbance (Figure 2).

FAA determined the APE boundary through consultation with TAA and Pima County on the extent of the proposed right-of-way and area of disturbance. Since the proposed undertaking will not affect the number or type of aircraft using Tucson International Airport, FAA delineated a physical disturbance area only. There would be no change in the indirect effects since there would be no changes to aircraft noise resulting from the proposed undertaking. FAA will include this information in the EA for the proposed project.

Pursuant to Title 36, Code of Federal Regulations, Section 800.4, **the FAA is seeking concurrence with the APE for the proposed undertaking from the Arizona State Historic Preservation Officer.**

If you have any further questions about this matter, please call me at 310/725-3612.

Sincerely,

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosures: Figure 1 Project Location
Figure 2 Survey Area and APE

cc: PHX-600; TAA, Pima County DOT

CONCUR

24APRIL14

Arizona State Historic Preservation Office

I concur with FAA's Area of Potential Effect determination for the proposed undertaking as described above.

_____ _____
Arizona SHPO Date

SHPO- 2014-0416 (121277)

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

August 18, 2014

Mr. James Garrison
Arizona State Historic Preservation Officer
Arizona State Parks
1300 W. Washington Street
Phoenix, Arizona 85007

RECEIVED
AUG 20 2014
ARIZONA STATE HISTORIC PRESERVATION OFFICE

RECEIVED
SEP 08 2014
Federal Aviation Administration
Western-Pacific Region
Airports Division - AWP-600

Attention: Mr. David Jacobs

Dear Mr. Garrison:

Proposed Hughes Access Road Relocation,
Tucson International Airport
Tucson, Pima County, Arizona
Section 106 Coordination

The Tucson Airport Authority (TAA) and the Federal Aviation Administration (FAA) are preparing federal environmental documentation under the National Environmental Policy Act (NEPA) of 1969 as amended, for the proposed release of TAA land to Pima County, to be used to relocate a segment of Hughes Access Road. TAA and the Pima County Department of Transportation (PCDOT) are proposing to relocate the existing paved two-lane, undivided section of Hughes Access Road immediately south of Tucson International Airport from just east of South Old Nogales Highway to South Alveron Way. The proposed project is to construct a new two-lane section of Hughes Access Road, approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor. The Federal Action for this project is the release of right-of-way for the segment of the project on TAA land, which is an approximate three mile portion of the roadway. A Cultural Resources Inventory report for the proposed undertaking is enclosed and shows the project location in Figure 1 and the proposed undertaking in Figure 2.

Background and Area of Potential Effect

The FAA provided a letter to your office dated April 17, 2014, which described the proposed undertaking and how FAA determined the Area of Potential Effect (APE). Your office provided a concurrence with the APE on April 21, 2014. This APE is an area comprising the new road right-of-way, areas of existing road right-of-way required for project construction, areas where the abandoned road would be removed, material management (staging) areas, vegetation transplant areas, areas where utilities would be relocated, areas necessary for the construction of new drainage structures, and any other areas of ground disturbance, and is shown in Figure 2 of the enclosed report.

Native American Consultation

On April 17, 2014, FAA sent consultation initiation letters to nine federally recognized Native American Tribes providing information about the APE and the proposed undertaking in order to determine their interest in the proposed undertaking. FAA sent the letters by U.S. Mail and provided response forms in stamped self-addressed envelopes to the following tribes; the San Carlos Apache Tribe, Tohono O'odham Nation, White Mountain Apache Tribe, Yavapai-Apache Nation, Salt River Pima-Maricopa Indian Community, Pascua Yaqui Tribe, Gila River Indian Community, Hopi Tribe, and the Ak-Chin Indian Community.

The San Carlos Apache Tribe responded that they had no interest in the proposed project and that no further consultation was required. The Tohono O'odham Nation and the Gila River Indian Community requested to be consulting parties on the proposed undertaking. FAA provided copy of the Cultural Resources Inventory report for their review on July 2, 2014, and requested tribal input regarding the proposed undertaking. A response letter from the Gila River Indian Community Tribal Historic Preservation Officer (THPO) on July 15, 2014, indicated they concurred with the FAA determination and finding of effects as indicated in our letter below. In telephone communication between myself and Peter Steere, the Tohono O'odham Nation THPO, on August 14, 2014, Mr. Steere provided verbal concurrence with the project and FAA determination based on the discussion of the project and results of the Cultural Resources Inventory that there were no historic resources within the APE and the FAA finding that the proposed undertaking would not result in any effects to listed or eligible historic properties.

National Register Eligibility Determinations

The enclosed report discusses the proposed undertaking, the APE, efforts to identify historic properties and the information that FAA used to make its finding of effect. The report describes the research and archeological survey conducted within the APE and the surrounding lands. The report identified 17 historical properties within the APE, including one archaeological site, two paved roads, two natural gas pipelines; and 12 Isolated Occurrences (IOs). The archeological site consists of corral, multiple dumps of trash and a rock pile that do not have the potential to yield any significant information. The two roads are not historically significant. The IO's include occurrences of prehistoric sites that have small numbers of artifacts, no features and no evidence of buried deposits, while the historic sites are primarily associated with unauthorized disposal of trash. Based on this information, the FAA has determined that the archaeological site, the two in-use paved roads, and the 12 IO's are not eligible for the National Register of Historic Places (NRHP). The two in-use pipelines are exempt from Section 106 review until they are abandoned, in accordance with the notice provided by the Advisory Council on Historic Preservation (*Federal Register* 67[66]:16364-16365). No other historic properties were identified within the APE. Also no places of traditional cultural significance to Native Americans or other cultural groups are in the APE.

Based on the information in the report, the FAA determined there are no historic properties listed or eligible for listing on the NRHP within the APE for the proposed undertaking. **FAA seeks your concurrence with this determination.**

Assessment of Adverse Effects on Historic Properties

Since the FAA has determined there are no historic properties listed or eligible for listing on the NRHP within the APE, the FAA finds that there are "no historic properties affected" from the proposed undertaking under 36 Code of Federal Regulations, Part 800.4(d)(1). **FAA seeks your concurrence with this finding.**

If you have any further questions about this matter, please contact Mr. David Kessler at 310/725-3615 or by email at dave.kessler@faa.gov.

Sincerely,

Peter F. Ciesla

Peter F. Ciesla
Regional Environmental Protection Specialist

Enclosure

cc: PHX-600; TAA, Pima County DOT

No Historic Properties Affected
29 AUG 14
Arizona State Historic Preservation Office
Arizona State Parks Board

APPENDIX C

Emissions Inventory

Technical Memorandum

URS

333 E Wetmore
Suite 400
Tucson, Arizona 85705
520-887-1800 Tel
520-887-8438 Fax

Action	Info	File
Dean Papajohn-PCDOT	Eric Sibson – URS	24097138

From Chuck Pedri

Date September 25, 2014

Subject **Hughes Access Road Replacement Project**
Air Quality Construction Emissions Inventory

Introduction

This memorandum documents the results of a construction air emissions analysis conducted to support the preparation of an Environmental Assessment (EA) for the proposed Hughes Access Road (4HARDR), which is considered the Proposed Action. While this project is to be accomplished on lands currently owned by Tucson Airport Authority (TAA), the proposed road relocation will not affect the number and frequency of aircraft operations (takeoffs or landings) at Tucson International Airport. Thus, this analysis was conducted to forecast only construction-related emissions inventories for the project as required under the Clean Air Act, as amended.

Construction Emissions

Estimates of construction-related emissions were developed for the 4HARDR using standard industry methodologies and techniques. The methods used to calculate emissions of carbon monoxide (CO), volatile organic compounds (VOCs), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), particulate matter less than 10 microns (PM_{10}), and fine particulate matter less than 2.5 microns ($PM_{2.5}$) are documented in this memo. Construction activities associated with the 4HARDR are anticipated to be completed within an 11-month time period and take place in the year 2015.

Potential sources of construction emissions include construction vehicles and equipment, land development activities, and asphalt paving activities. Asphalt would be batched offsite at batch plant facilities operating under stationary sources permits, as such, emissions were not estimated separately for batch plants.

Construction Vehicles and Equipment

Construction vehicles and equipment emissions are generally estimated using two basic methodologies (on-road and non-road) depending on the type of construction equipment. On-road construction equipment (e.g., semi-trucks for material hauling), can be operated on public roads. Non-road construction equipment (e.g., bulldozers, backhoes, front end loaders) are generally operated off road and on the construction site. Emissions for on-road and non-road construction equipment were estimated separately following standard industry practices.

Construction emissions were estimated for each proposed major construction task in support of the 4HARDR. These activities include, but not be limited to, clearing and grubbing, demolition, excavation, providing borrow, paving, constructing box culverts, installing signing, pavement marking, signals & lighting, seeding, concrete work, and channel lining. Construction data (equipment types, horsepower ratings, and operating hours) required to conduct the emissions estimates for these activities were based on best engineering judgment.

On-Road Construction Equipment

Emissions from on-road construction vehicles/equipment were calculated using the methodologies outlined in U.S. EPA AP-42, *Compilation of Air Pollutant Emission Factors Fifth Edition, Volume II: Mobile Sources.* On-road construction vehicle trips include construction employee vehicle trips to and from the job site, material delivery trips and off-site hauling trips. Total vehicle miles traveled (VMT) for each type of on-road construction activity during the construction year, 2015 were estimated by multiplying the number of vehicle trips by the average trip distance.

Employee Vehicle Trips

It was estimated that there would be an average of 23 employees and two PCDOT construction management staff traveling to and from the site per day. It was assumed that each worker would travel to and from the job site once per day, five days per week, for 11 months. The 11-month construction period (based on an 8-hour work day) is a conservative estimation and actual construction may be completed in less time. An average length of 20 miles for each round trip was assumed. Based on an 11-month construction duration, which equates to about 230 working days, there would be a total of 115,000 VMT from employee trips generated by the 4HARDR.

Material Delivery/Off-Site Hauling Vehicle Trips

Deliveries to the site would include construction materials (borrow, concrete, steel, asphalt, aggregate base, and riprap), office supplies, mail, equipment replacement parts, and test samples. Off-site hauling trips would be for disposal of any waste from clearing and grubbing and demolition activities, as well as any unsuitable earth material. It was estimated that there would be an average of 35 delivery/off-site haul round trips to/from the site each day. An average length of 16 miles for each round trip was assumed.

Over the 11-month (230 days) project duration there would be about 130,000 VMT from delivery and haul trips generated by the 4HARDR.

Emission Factors

Emission factors for on-road construction equipment were developed using the latest version of the Motor Vehicle Emission Simulator (MOVES2014) developed by the U.S. Environmental Protection Agency (EPA). For the employee vehicle trips, the model was run using the national vehicle fleet and fuel mix. For the material delivery and off-site haul vehicle trips, a mix of gasoline trucks, diesel short haul trucks, and diesel combination short haul trucks was assumed.

Table 1 presents the MOVES2014 emission factors use to calculate emissions for on-road construction equipment related to the 4HARDR for the year 2015.

Table 1 On-Road Construction Equipment Emission Factors (2015)

	Emission Factors (grams/per vehicle-mile)					
Source	**CO**	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Employee Vehicle Trips	5.260	0.562	0.677	0.009	0.010	0.009
Material Delivery/ Off-Site Haul Trips	2.710	0.655	7.677	0.016	0.308	0.335

On-Road Construction Emissions

Potential on-road construction emissions are estimated by multiplying the VMT data by the appropriate emission factors and the necessary conversion factors to present the emissions in tons per year. Table 2 presents the potential emission estimates for on-road construction equipment for the Proposed Action.

Table 2 On-Road Construction Equipment Emissions (2015)

		Emissions (tons per year)					
Source	**VMT**	**CO**	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Employee Vehicle Trips	115,000	0.666	0.071	0.086	0.001	0.001	0.001
Material Delivery/ Off-Site Haul Trips	130,000	0.388	0.094	1.099	0.002	0.044	0.048
Total		**1.054**	**0.165**	**1.185**	**0.003**	**0.045**	**0.049**

Non-road Construction Equipment

Non-road construction equipment includes bulldozers, loaders, scrapers, excavators, and other heavy-duty construction equipment that does not travel on roadways. Emissions for non-road vehicles equipped with diesel-powered engines are regulated under 40 CFR Part 89.112, *Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards.* Emission factors associated with diesel engines vary by equipment type and horsepower.

Non-road construction equipment emissions in 2015 under the Proposed Action were calculated based on the number of operating hours of equipment use and the emission factors. The methodology shown in the following equation was used for calculating emissions from non-road construction equipment.

M = (HRS) (EF)

where:

M = mass of emissions of each pollutant during the inventory period;
HRS = number of operating hours;
EF = average emissions of each pollutant per unit of use (grams per operating hour).

The annual hours of use of each type of equipment for the 4HARDR project was estimated by URS personnel based on best engineering judgment (See Table A-1 in the Appendix). The horsepower and load factors used were the default values used by the California Air Resources Board's NONROAD model. Emission factors for non-road construction equipment were developed using the 2008 version of the NONROADS model developed by the U.S. Environmental Protection Agency (EPA).

Table 3 presents the NONROADS 2008 emission factors use to calculate emissions for non-road construction equipment related to the 4HARDR for the year 2015.

Non-Road Construction Emissions

Potential non-road construction emissions are estimated by using the U.S. EPA equation and multiplying the estimated number of operating hours of each type of equipment by the load factor data and by the appropriate emission factors and the necessary conversion factors to present the emissions in tons per year.

Table 3 Non-Road Construction Equipment Emission Factors (2015)

			Emission Factors (grams per operating hour)					
Source	**Fuel Type**	**Horse-power**	**CO**	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Pavers	Diesel	126	73.03	16.05	177.27	8.08	21.78	21.78
Rollers	Diesel	81	129.62	12.84	141.05	5.7	20.02	20.02
Paving Equipment	Diesel	131	83.96	18.63	212.91	8.1	22.24	22.24
Surfacing Equipment	Diesel	254	126.78	31.76	385.52	14.18	31.62	31.62
Bore/Drill Rigs	Diesel	206	116.52	34.18	440.6	10.89	27.15	27.15
Cranes	Diesel	226	50.16	19.48	232.13	10.15	16.47	16.47
Tractors/Loaders /Backhoes	Diesel	98	104.35	17.24	85.04	2.55	16.23	16.23
Dumpster/Tenders	Diesel	16	34.59	8.33	30.19	0.74	5.01	5.01
Other Construction Equipment	Diesel	172	89.89	19.93	229.64	8.52	23.57	23.57
Scrapers	Diesel	362	255.53	42.91	642.37	25.5	51	51
Excavators	Diesel	163	64.67	14.3	148.07	7.99	21.14	21.14
Graders	Diesel	175	71.32	15.39	165.29	8.32	22.39	22.39
Off Highway Trucks	Diesel	400	157.52	36.91	403.14	23.48	45.09	45.09

Table 4 presents the potential emission estimates for non-road construction equipment for the Proposed Action.

Table 4 Non-Road Construction Equipment Emissions (2015)

					Emissions (tons/year)					
Source	**Fuel Type**	**Horse-power**	**Load Factor**	**Operating hours**	**CO**	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Pavers	Diesel	126	0.42	320	0.026	0.006	0.062	0.003	0.008	0.008
Rollers	Diesel	81	0.38	320	0.046	0.005	0.050	0.002	0.007	0.007
Paving Equipment	Diesel	131	0.36	320	0.030	0.007	0.075	0.003	0.008	0.008
Surfacing Equipment	Diesel	254	0.30	320	0.045	0.011	0.136	0.005	0.011	0.011
Bore/Drill Rigs	Diesel	206	0.50	280	0.036	0.011	0.136	0.003	0.008	0.008
Cranes	Diesel	226	0.29	160	0.009	0.003	0.041	0.002	0.003	0.003
Tractors/ Loaders /Backhoes	Diesel	98	0.37	1280	0.147	0.024	0.120	0.004	0.023	0.023
Dumpster/ Tenders	Diesel	16	0.38	720	0.027	0.007	0.024	0.001	0.004	0.004
Other Construction Equipment	Diesel	172	0.42	2280	0.226	0.050	0.577	0.021	0.059	0.059
Scrapers	Diesel	362	0.48	320	0.090	0.015	0.226	0.009	0.018	0.018
Excavators	Diesel	163	0.38	160	0.011	0.003	0.026	0.001	0.004	0.004
Graders	Diesel	175	0.41	400	0.031	0.007	0.073	0.004	0.010	0.010
Off Highway Trucks	Diesel	400	0.38	400	0.069	0.016	0.178	0.010	0.020	0.020
				Total	**0.793**	**0.164**	**1.723**	**0.068**	**0.182**	**0.182**

Land Development

Earth moving activities during construction and wind erosion are sources of fugitive dust emissions. PM_{10} and $PM_{2.5}$ emissions caused by earth moving and wind erosion were calculated using methodologies outlined in Section 13.2.3 "Heavy Construction Operations" of AP-42. Fifth Edition, Volume 1.

Earth Moving Fugitive Dust Emissions

Fugitive dust from non-road vehicles includes entrained road dust as well as particulates resulting from scraping, grading, loading and unloading, and general travel activities. PM_{10} and $PM_{2.5}$ emissions caused by earth moving were calculated using methodologies outlined in Section 13.2.3 of AP-42. It was assumed that PM_{10} emissions are about 31 percent of the TSP emissions and $PM_{2.5}$ emissions are about 10.5 percent of the total suspended particulates (TSP) emissions. It was also assumed that water would be applied to the construction site soil approximately 3 to 4 times per day (every 3 hours) to reduce PM_{10} and $PM_{2.5}$ emissions caused by construction operations. According to the mitigation measures discussed in Table XI-A of the South Coast Air Quality Management District's Fugitive Dust Mitigation Measure Tables, this control method would result in a control efficiency of 61 percent for PM_{10} emissions. For purposes of this analysis, it was assumed that this same control efficiency would be appropriate for $PM_{2.5}$ emissions as well. Tables 5a and 5b present the results of the analysis of the PM_{10} and $PM_{2.5}$ fugitive dust emissions from earth moving activities for the year 2015 under the Proposed Action. Refer to tables A-2 and A-3 in the Appendix for the calculations for PM_{10} and $PM_{2.5}$ emissions, respectively.

Table 5a Earth Moving Fugitive Dust PM_{10} Emissions (2015)

			Emission Factor		Unit	Quantity	Control Efficiency	PM_{10} Emissions (lbs/year)	PM_{10} Emissions (tons/year)
	Activity		**TSP**	**PM10**					
Demolition and Debris Removal	Drilling		1.3	0.403	holes	134	0.61	21,061	0.011
	Scrapers removing topsoil		0.058	0.018	tons	11475	0.61	80,465	0.040
	Scraper unloading of topsoil		0.04	0.012	tons	11475	0.61	55,493	0.028
	Loading/Unloading of topsoil into Trucks		0.002	0.002	tons	11475	0.61	6,779	0.003
	Truck Transport of topsoil onsite		12.390	12.390	miles	34	0.61	166,350	0.08
Site Preparation	Scrapers removing onsite soil		0.058	0.018	tons	28509	0.61	199,911	0.100
	Scraper unloading of earthwork		0.040	0.012	tons	28509	0.61	137,870	0.069
	Scrapers removing borrow		0.058	0.018	tons	83726	0.61	587,103	0.294
	Scraper unloading of material		0.040	0.012	tons	83726	0.61	404,899	0.202
	Loading/Unloading of borrow into Trucks		0.002	0.002	tons	83726	0.61	49,460	0.025
	Truck Transport of borrow onsite		12.390	12.390	miles	251	0.61	1213,754	0.607
	Truck Dumping of Fill Material (AB)		0.002	0.002	tons	62205	0.61	42,927	0.021
	Motor Grading		0.765	0.237	acres-hr	8430	0.61	779,655	0.390
		Subtotal							**1.873**
General Construction	**Equipment Travel**	**HP**	**WT (lbs)**	**PM10 Emission Factor**	**Unit**	**Quantity**		**PM_{10} Emissions (lbs/year)**	**PM_{10} Emissions (tons/year)**
	Pavers	126	39000	8.111	miles	16	0.61	50,611	0.025
	Rollers	81	18000	5.727	miles	16	0.61	35,739	0.018
	Paving Equipment	131	35000	7.725	miles	16	0.61	48,206	0.024
	Surfacing Equipment	254	45000	8.650	miles	8	0.61	26,989	0.013
	Bore/Drill Rigs	206	N/A	0.000	miles	N/A	N/A	N/A	N/A
	Cranes	226	N/A	0.000	miles	N/A	N/A	N/A	N/A
	Tractors/Loaders /Backhoes	98	15000	5.276	miles	100	0.61	205,774	0.103
	Dumpster/Tenders	16	10000	4.396	miles	50	0.61	85,727	0.043
	Other Construction Equipment	172	40000	8.204	miles	200	0.61	639,891	0.320
	Scrapers	362	110000	12.933	miles	N/A	N/A	N/A	N/A
	Excavators	163	58000	9.697	miles	15	0.61	56,726	0.028
	Graders	175	44000	8.563	miles	N/A	N/A	N/A	N/A
	Off Highway Trucks	400	100000	12.390	miles	N/A	N/A	N/A	N/A
		Subtotal							**0.575**
		TOTAL							**2.448**

Table 5b Earth Moving Fugitive Dust $PM_{2.5}$ Emissions (2015)

			Emission Factor			Unit	Quantity	Control Efficiency	$PM_{2.5}$ Emissions (lbs/year)	$PM_{2.5}$ Emissions (tons/year)
	Activity		**TSP**	**$PM_{2.5}$**						
Demolition and Debris Removal	Drilling		1.3	0.137	lb/hole	holes	134	0.61	7.133	0.004
	Scrapers removing topsoil		0.058	0.006	lb/ton	tons	11475	0.61	27.254	0.014
	Scraper unloading of topsoil		0.04	0.004	lb/ton	tons	11475	0.61	18.796	0.009
	Loading/Unloading of topsoil into Trucks		0.002	0.002	lb/ton	tons	11475	0.61	6.779	0.003
	Truck Transport of topsoil onsite		12.390	12.390	lb/VMT	miles	34	0.61	166.350	0.08
Site Preparation	Scrapers removing onsite soil		0.058	0.006	lb/ton	tons	28509	0.61	67.712	0.034
	Scraper unloading of earthwork		0.040	0.004	lb/ton	tons	28509	0.61	46.698	0.023
	Scrapers removing borrow		0.058	0.006	lb/ton	tons	83726	0.61	198.858	0.099
	Scraper unloading of material		0.040	0.004	lb/ton	tons	83726	0.61	137.143	0.069
	Loading/Unloading of borrow into Trucks		0.002	0.002	lb/ton	tons	83726	0.61	49.460	0.025
	Truck Transport of borrow onsite		12.390	12.390	lb/VMT	miles	251	0.61	1213.754	0.607
	Truck Dumping of Fill Material (AB)		0.002	0.002	lb/tons	tons	62205	0.61	42.927	0.021
	Motor Grading		0.765	0.080	lb/acre-hr	acres-hr	8430	0.61	264.077	0.132
		Subtotal								**1.123**
General Construction	**Equipment Travel**	**HP**	**WT (lbs)**	**$PM_{2.5}$ Emission Factor**		**Unit**	**Quantity**		**$PM_{2.5}$ Emissions (lbs/year)**	**$PM_{2.5}$ Emissions (tons/year)**
	Pavers	126	39000	0.811	lb/VMT	miles	16	0.61	5.061	0.003
	Rollers	81	18000	0.573	lb/VMT	miles	16	0.61	3.574	0.002
	Paving Equipment	131	35000	0.773	lb/VMT	miles	16	0.61	4.821	0.002
	Surfacing Equipment	254	45000	0.865	lb/VMT	miles	8	0.61	2.699	0.001
	Bore/Drill Rigs	206	N/A	0.000	lb/VMT	miles	N/A	N/A	N/A	N/A
	Cranes	226	N/A	0.000	lb/VMT	miles	N/A	N/A	N/A	N/A
	Tractors/Loaders /Backhoes	98	15000	0.528	lb/VMT	miles	100	0.61	20.577	0.010
	Dumpster/Tenders	16	10000	0.440	lb/VMT	miles	50	0.61	8.573	0.004
	Other Construction Equipment	172	40000	0.820	lb/VMT	miles	200	0.61	63.989	0.032
	Scrapers	362	110000	1.293	lb/VMT	miles	N/A	N/A	N/A	N/A
	Excavators	163	58000	0.970	lb/VMT	miles	15	0.61	5.673	0.003
	Graders	175	44000	0.856	lb/VMT	miles	N/A	N/A	N/A	N/A
	Off Highway Trucks	400	100000	1.239	lb/VMT	miles	N/A	N/A	N/A	N/A
		Subtotal								**0.057**
		TOTAL								**1.181**

Wind Erosion Emissions

Dirt piles, areas of bare soils, and newly paved portions of a construction site can be sources of wind blow PM10. Emission factors for wind erosion were derived from Section 11.9, "Western Surface Coad Mining," of AP-42. Fifth Edition, Volume 1. Coal mining emissions factors were used in the analysis where AP-42 dust factors were not provided. PM_{10} emissions associated with wind erosion were calculated: (a) for the period of time when the area of disturbance would have exposed soil and (b) for the period of time after the area of disturbance would be paved.

Wind erosion emissions are calculated by determining the acreage affected by land development activities and multiplying the acreage amount by the appropriate emissions factor and control efficiency factor. The methodology used to calculated wind erosion emissions is presented in the following equation:

$M = (A)\ (YR)\ (1\text{-}CE)\ (EF)\ (PM_{10}$ or $PM_{2.5}$ fraction$)$

Where:

M = mass of emissions of each pollutant during inventory period;
A = area of land affected (acres);
YR = percentage of year that operations are occurring;
CE = control efficiency of mitigation measures taken (watering, etc.);
EF = average emission factor of total suspended particulates (TSP) per unit of use (tons per acre per year).
PM_x fraction = percentage of TSP that is either PM_{10} or $PM_{2.5}$

For purposes of the wind erosion analysis, it was assumed that adequate watering would occur at the construction site before paving. It was assumed that water would be applied to the construction site soil approximately 3 to 4 times per day (every 3 hours) to reduce PM_{10} and $PM_{2.5}$ emissions caused by wind erosion. This control method should result in a control efficiency of about 50 percent. As discussed previously, it is assumed that PM_{10} emissions are about 31 percent of the TSP emissions and $PM_{2.5}$ emissions are about 10.5 percent of the TSP emissions. Table 6 presents the results of the wind erosion emissions analysis for the year 2015 under the Proposed Action.

Table 6 Wind Erosion Emissions (2015)

Emission Type	Total Area Affected (acres)	TSP Emission Factor (tons/acre/year)	PM_x Fraction	Percentage of Year with Operations	Control Efficiency	PM Emissions (tons/yr)
PM_{10}	100	0.38	0.31	92%	50%	5.422
$PM_{2.5}$	100	0.38	0.105	92%	50%	1.835

Asphalt Paving

Asphalt surfaces and pavements are composed of compacted aggregate and an asphalt binder. Aggregate materials are produced from rock quarries as manufactured stone or are obtained from natural gravel or soil deposits. Asphalt binders take the form of asphalt cement (the residue of the distillation of crude oils) and liquefied asphalts. Asphalt cement, which is semi-solid, must be heated prior to mixing with aggregate.

Asphalt paving operations can be a source of VOC emissions. VOC emissions are created by the evaporation of the petroleum distillate solvent, or diluent, used to liquefy asphalt cement. Emissions from asphalt paving activities were calculated for the Proposed Action using the methodologies presented in Section 4.5, "Asphalt Paving Operations" of AP-42, Fifth Edition, Volume 1. The formula used to calculate VOC emissions caused by asphalt paving operations is presented in the following equation:

M = (A) (AR) (VD) (EF) (D)

Where:

M = mass of emissions of each type pollutant during inventory period;
A = area of land affected (square meters);
AR = application rate of liquefied asphalt over area (liters per square meter);
VD = percent, by volume, of diluent in liquefied asphalt (percentage);
EF = percent of diluent (mass) that evaporates and becomes VOC;
D = density of solvent used (pounds per liter).

The following assumptions were used to estimate VOC emissions associated with asphalt paving operations:

- The asphalt would be put down in two lifts (layers). The asphalt paving process would include one tack coat between lifts. There would be no prime coat paving.

- Asphalt paving operations were assumed to include liquefied asphalts as the asphalt binder. Liquefied asphalts would include emulsified asphalts. No cutback asphalts would be used for the project. Emulsified asphalts were assumed to be 3 percent VOC by volume.

- The application rate for the tack coat would be 0.06 gallons of emulsified asphalt per square yard of paving.

Table 7 presents a summary of VOC emissions associated with asphalt paving activities for the Proposed Action.

Table 7 Asphalt Paving Emissions (2015)

Asphalt Application	Paved Area (sy)	Solvent Density (lbs/gal)	Application Rate (gal/sy)	Percent VOC Emitted	Total VOC Emissions (tons/yr)
Tack Coat	102,000	8.33	0.06	3%	0.765

Summary of Construction Emissions Analysis

A summary of the total construction related emissions for the Proposed Action in the year 2015 is presented in Table 8. Potentially applicable Federal and Pima County emissions standards have been included for comparison. The total forecasted emissions for each pollutant included in this analysis for the Proposed Action are well below applicable significance thresholds established for air pollution emissions during any given calendar year by the following:

- Pima County Code Title 17

- Federal (40 CFR 93.153)

This project also meets the goal of transportation conformity since it does not generate any new motor vehicle activity nor affects the number and frequency of aircraft operations (takeoffs or landings) at Tucson International Airport.

Table 8 Construction Emissions Summary (2015)

	Pollutant Emissions (tons per year)					
Source	**CO**	**VOC**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
On-Road Equipment	1.054	0.165	1.185	0.003	0.045	0.049
Non-Road Equipment	0.793	0.164	1.723	0.068	0.182	0.182
Land Development-Earth Moving	0	0	0	0	2.448	1.181
Land Development-Wind Erosion	0	0	0	0	5.422	1.835
Asphalt Paving	0	0.765	0	0	0	0
Total	**1.847**	**1.094**	**2.908**	**0.071**	**8.097**	**3.247**
Significance Threshold (Pima County Code Title 17)	**100**	**40**	**40**	**40**	**15**	**10**
Significance Threshold (Federal-40 CFR 93.153)	**100**	**50**	**100**	**100**	**100**	**100**
Thresholds Exceeded	**No**	**No**	**No**	**No**	**No**	**No**

APPENDIX

Table A-1
Hughes Access Road Replacement Project
Estimated Total Operating Hours Per Equipment Type

Type of Equipment	Fuel Type	hp	Load Factor	Clear & Grubb	Removals	Excavation	Borrow	Paving	Drainage	Box Culvert	Signing	Pvmt Marking	Signals & Lighting	Seeding	Concrete Work	Channel Lining	Total
Pavers	Diesel	126	0.42					320									320
Rollers	Diesel	81	0.38					320									320
Paving Equipment	Diesel	131	0.36					320									320
Surfacing Equipment	Diesel	254	0.3					320									320
Bore/Drill Rigs	Diesel	206	0.5								120						120
Cranes	Diesel	226	0.29										160				160
Tractors/Loaders/Backhoes	Diesel	98	0.37	80	80	160	160		400	240						160	1,280
Dumpster/Tenders	Diesel	16	0.38					320	400								720
Other Construction Equipment	Diesel	172	0.42	80	80	160	160	320	400	240	120	80	160	160	160	160	2,280
Scrapers	Diesel	362	0.48			160	160										320
Excavators	Diesel	163	0.38			160											160
Graders	Diesel	175	0.41	80				320									400
Off Highway Trucks	Diesel	400	0.38		80	160	160										400

Table A-2

HUGHES ACCESS ROAD REPLACEMENT PROJECT

PM10 FUGITIVE DUST EMISSIONS

			Emission Factor				Unit	Quantity	Control Efficiency	PM_{10} Emissions (lbs/year)	PM_{10} Emissions (tons/year)
	Activity		**TSP**	**PM_{10}**		**AP-42 Reference**					
Demolition and Debris Removal	Drilling		1.3	0.403	lb/hole	(Table 11.9.4)	holes	134	0.61	21.061	0.011
	Scrapers removing topsoil		0.058	0.018	lb/ton	(Table 11.9.4)	tons	11475	0.61	80.465	0.040
	Scraper unloading of topsoil		0.04	0.012	lb/ton	(Table 11.9.4)	tons	11475	0.61	55.493	0.028
	Loading/Unloading of topsoil into Trucks		0.002	0.002	lb/ton	(Equation 1 in 13.2.4.3)	tons	11475	0.61	6.779	0.003
	Truck Transport of topsoil onsite		12.390	12.390	lb/VMT	(Equation 1a in 13.2.2.2)	miles	34	0.61	166.350	0.08
Site Preparation	Scrapers removing onsite soil		0.058	0.018	lb/ton	(Table 11.9.4)	tons	28509	0.61	199.911	0.100
	Scraper unloading of earthwork		0.040	0.012	lb/ton	(Table 11.9.4)	tons	28509	0.61	137.870	0.069
	Scrapers removing borrow		0.058	0.018	lb/ton	(Table 11.9.4)	tons	83726	0.61	587.103	0.294
	Scraper unloading of material		0.040	0.012	lb/ton	(Table 11.9.4)	tons	83726	0.61	404.899	0.202
	Loading/Unloading of borrow into Trucks		0.002	0.002	lb/ton	(Equation 1 in 13.2.4.3)	tons	83726	0.61	49.460	0.025
	Truck Transport of borrow onsite		12.390	12.390	lb/VMT	(Equation 1a in 13.2.2.2)	miles	251	0.61	1213.754	0.607
	Truck Dumping of Fill Material (AB)		0.002	0.002	lb/tons	(Equation 1 in 13.2.4.3)	tons	62205	0.61	42.927	0.021
	Motor Grading		0.765	0.237	lb/acre-hr	(Table 11.9.4)	acres-hr	8430	0.61	779.655	0.390
		Subtotal			**Subtotal**						**1.873**
General Construction	**Equipment Travel**	**HP**	**WT (lbs)**	**PM_{10} Emission Factor**			**Unit**	**Quantity**		**PM_{10} Emissions (lbs/year)**	**PM_{10} Emissions (tons/year)**
	Pavers	126	39000	8.111	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	50.611	0.025
	Rollers	81	18000	5.727	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	35.739	0.018
	Paving Equipment	131	35000	7.725	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	48.206	0.024
	Surfacing Equipment	254	45000	8.650	lb/VMT	(Equation 1a in 13.2.2.2)	miles	8	0.61	26.989	0.013
	Bore/Drill Rigs	206	N/A	0.000	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Cranes	226	N/A	0.000	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Tractors/Loaders /Backhoes	98	15000	5.276	lb/VMT	(Equation 1a in 13.2.2.2)	miles	100	0.61	205.774	0.103
	Dumpster/Tenders	16	10000	4.396	lb/VMT	(Equation 1a in 13.2.2.2)	miles	50	0.61	85.727	0.043
	Other Construction Equipment	172	40000	8.204	lb/VMT	(Equation 1a in 13.2.2.2)	miles	200	0.61	639.891	0.320
	Scrapers	362	110000	12.933	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Excavators	163	58000	9.697	lb/VMT	(Equation 1a in 13.2.2.2)	miles	15	0.61	56.726	0.028
	Graders	175	44000	8.563	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Off Highway Trucks	400	100000	12.390	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
		Subtotal			**Subtotal**						**0.575**
		TOTAL			**Total**						**2.448**

Table A-2 (continued)

HUGHES ACCESS ROAD REPLACEMENT PROJECT

PM10 FUGITIVE DUST EMISSION FACTOR CALCULATIONS

General Land Clearing PM10 Emissions (tons/year)

Loading/Unloading of Debris by Trucks (Equation 1 in 13.2.4.3)

EF= 2 x k x 0.0032 x((U/5)^1.3/((M/2)^1.4)

k = particle size multiplier (dimensionless) = 0.35 for <10 um

U = mean wind speed (mph) = 11 based on average wind speeds for Tucson

M = moisture content (%) = 5.5% based on average of moisture content of soil samples from geotech investigation

EF= 0.001515 lbs/ton

Truck transport of Debris (Unpaved road) (Equation 1a in 13.2.2.2)

EF= k x (s/12)^a x (W/3)^b

k= constant = 1.5 1b/VMT)

s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation

W = mean vehicle weight = 50 tons for 400 hp dump truck (half time empty and half time fully loaded)

a = constant = 0.9

b = constant = 0.45

EF= 12.39038 lb/VMT

Site Preparation

Loading/Unloading of Borrow by Trucks (Equation 1 in 13.2.4.3) PM10 Emissions (tons/year)

EF= 2 x k x 0.0032 x((U/5)^1.3/((M/2)^1.4)

k = particle size multiplier (dimensionless) = 0.35 for <10 um

U = mean wind speed (mph) = 11 based on average wind speeds for Tucson

M = moisture content (%) = 5.5% based on average of moisture content of soil samples from geotech investigation

EF= 0.001515 lbs/ton

Truck transport of borrow (Unpaved road) (Equation 1a in 13.2.2.2)

EF= k x (s/12)^a x (W/3)^b

k= constant = 1.5 1b/VMT)

s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation

W = mean vehicle weight = 50 tons for 400 hp dump truck (half time empty and half time fully loaded)

a = constant = 0.9

b = constant = 0.45

EF= 12.39038 lb/VMT

Table A-2 (continued)
HUGHES ACCESS ROAD REPLACEMENT PROJECT
FUGITIVE DUST EMISSION FACTOR CALCULATIONS (continued)

Truck Dumping of Fill Material (AB) (Equation 1 in 13.2.4.3)

EF= k x 0.0032 x((U/5)^1.3/((M/2)^1.4)
k = particle size multiplier (dimensionless) = 0.35 for <10 um
U = mean wind speed (mph) = 11 based on average wind speeds for Tucson
M = moisture content (%) = 3% based on average of moisture content of soil samples from geotech investigation
EF= 0.001769 lbs/ton

Motor Grading

EF= 0.60 x 0.051 (S^2.0)
S = mean vehicle speed (mph) = 5
EF= 0.765 1b/acre-hr

Relationship between TSP and PM10

for TSP EF= 5.7 (s)^1.2/M^1.3
s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation
M = moisture content (%) = 5.5% based on average of moisture content of soil samples from geotech investigation
EF= 37.84159 lbs/hour

for <10um EF= 0.75 x 1.0 (s)^1.5/M^1.4
s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation
M = moisture content (%) = 5.5% based on average of moisture content of soil samples from geotech investigation
EF= 11.729 lbs/hour

Ratio of PM10/TSP= 0.30995

Table A-3

HUGHES ACCESS ROAD REPLACEMENT PROJECT

PM2.5 FUGITIVE DUST EMISSIONS

			Emission Factor				Unit	Quantity	Control Efficiency	$PM_{2.5}$ Emissions (lbs/year)	$PM_{2.5}$ Emissions (tons/year)
Activity			TSP	$PM_{2.5}$		AP-42 Reference					
Demolition and Debris Removal	Drilling		1.3	0.137	lb/hole	(Table 11.9.4)	holes	134	0.61	7.133	0.004
	Scrapers removing topsoil		0.058	0.006	lb/ton	(Table 11.9.4)	tons	11475	0.61	27.254	0.014
	Scraper unloading of topsoil		0.04	0.004	lb/ton	(Table 11.9.4)	tons	11475	0.61	18.796	0.009
	Loading/Unloading of topsoil into Trucks		0.002	0.002	lb/ton	(Equation 1 in 13.2.4.3)	tons	11475	0.61	6.779	0.003
	Truck Transport of topsoil onsite		12.390	12.390	lb/VMT	(Equation 1a in 13.2.2.2)	miles	34	0.61	166.350	0.08
Site Preparation	Scrapers removing onsite soil		0.058	0.006	lb/ton	(Table 11.9.4)	tons	28509	0.61	67.712	0.034
	Scraper unloading of earthwork		0.040	0.004	lb/ton	(Table 11.9.4)	tons	28509	0.61	46.698	0.023
	Scrapers removing borrow		0.058	0.006	lb/ton	(Table 11.9.4)	tons	83726	0.61	198.858	0.099
	Scraper unloading of material		0.040	0.004	lb/ton	(Table 11.9.4)	tons	83726	0.61	137.143	0.069
	Loading/Unloading of borrow into Trucks		0.002	0.002	lb/ton	(Equation 1 in 13.2.4.3)	tons	83726	0.61	49.460	0.025
	Truck Transport of borrow onsite		12.390	12.390	lb/VMT	(Equation 1a in 13.2.2.2)	miles	251	0.61	1213.754	0.607
	Truck Dumping of Fill Material (AB)		0.002	0.002	lb/tons	(Equation 1 in 13.2.4.3)	tons	62205	0.61	42.927	0.021
	Motor Grading		0.765	0.080	lb/acre-hr	(Table 11.9.1)	acres-hr	8430	0.61	264.077	0.132
		Subtotal			**Subtotal**						**1.123**
General Construction	**Equipment Travel**	**HP**	**WT (lbs)**	**$PM_{2.5}$ Emission Factor**			**Unit**	**Quantity**		**$PM_{2.5}$ Emissions (lbs/year)**	**$PM_{2.5}$ Emissions (tons/year)**
	Pavers	126	39000	0.811	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	5.061	0.003
	Rollers	81	18000	0.573	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	3.574	0.002
	Paving Equipment	131	35000	0.773	lb/VMT	(Equation 1a in 13.2.2.2)	miles	16	0.61	4.821	0.002
	Surfacing Equipment	254	45000	0.865	lb/VMT	(Equation 1a in 13.2.2.2)	miles	8	0.61	2.699	0.001
	Bore/Drill Rigs	206	N/A	0.000	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Cranes	226	N/A	0.000	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Tractors/Loaders /Backhoes	98	15000	0.528	lb/VMT	(Equation 1a in 13.2.2.2)	miles	100	0.61	20.577	0.010
	Dumpster/Tenders	16	10000	0.440	lb/VMT	(Equation 1a in 13.2.2.2)	miles	50	0.61	8.573	0.004
	Other Construction Equipment	172	40000	0.820	lb/VMT	(Equation 1a in 13.2.2.2)	miles	200	0.61	63.989	0.032
	Scrapers	362	110000	1.293	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Excavators	163	58000	0.970	lb/VMT	(Equation 1a in 13.2.2.2)	miles	15	0.61	5.673	0.003
	Graders	175	44000	0.856	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
	Off Highway Trucks	400	100000	1.239	lb/VMT	(Equation 1a in 13.2.2.2)	miles	N/A	N/A	N/A	N/A
		Subtotal			**Subtotal**						**0.057**
		TOTAL			**Total**						**1.181**

Table A-3 (continued)
HUGHES ACCESS ROAD REPLACEMENT PROJECT
PM2.5 FUGITIVE DUST EMISSION FACTOR CALCULATIONS

General Land Clearing PM10 Emissions (tons/year)

Loading/Unloading of Debris by Trucks (Equation 1 in 13.2.4.3)

EF= 2 x k x 0.0032 x((U/5)^1.3/((M/2)^1.4)
k = particle size multiplier (dimensionless) = 0.35 for <10 um
U = mean wind speed (mph) = 11 based on average wind speeds for Tucson
M = moisture content (%) = 5.5% based on average of moisture content of soil samples from geotech investigation
EF= 0.001515 lbs/ton

Truck transport of Debris (Unpaved road) (Equation 1a in 13.2.2.2)

EF= k x (s/12)^a x (W/3)^b
k= constant = 1.5 1b/VMT)
s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation
W = mean vehicle weight = 50 tons for 400 hp dump truck (half time empty and half time fully loaded)
a = constant = 0.9
b = constant = 0.45
EF= 12.39038 lb/VMT

Site Preparation

Loading/Unloading of Borrow by Trucks (Equation 1 in 13.2.4.3) PM10 Emissions (tons/year)

EF= 2 x k x 0.0032 x((U/5)^1.3/((M/2)^1.4)
k = particle size multiplier (dimensionless) = 0.35 for <10 um
U = mean wind speed (mph) = 11 based on average wind speeds for Tucson
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EF= 0.001515 lbs/ton

Truck transport of borrow (Unpaved road) (Equation 1a in 13.2.2.2)

EF= k x (s/12)^a x (W/3)^b
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s = silt content (%) = 30.7% based on average of silt content of soil samples from geotech investigation
W = mean vehicle weight = 50 tons for 400 hp dump truck (half time empty and half time fully loaded)
a = constant = 0.9
b = constant = 0.45
EF= 12.39038 lb/VMT

Table A-3 (continued)

HUGHES ACCESS ROAD REPLACEMENT PROJECT

PM2.5 FUGITIVE DUST EMISSION FACTOR CALCULATIONS (continued)

Truck Dumping of Fill Material (AB) (Equation 1 in 13.2.4.3)

EF= k x 0.0032 x((U/5)^1.3/((M/2)^1.4)

k = particle size multiplier (dimensionless) = 0.35 for <10 um

U = mean wind speed (mph) = 11 based on average wind speeds for Tucson

M = moisture content (%) = 3% based on average of moisture content of soil samples from geotech investigation

EF= 0.001769 lbs/ton

Motor Grading

EF= 0.60 x 0.051 (S^2.0)

S = mean vehicle speed (mph) = 5

EF= 0.765 1b/acre-hr

Relationship between TSP and PM10

Ratio of PM2.5/TSP= 0.105

APPLICABLE PIMA COUNTY AIR QUALITY CODES

- *Pima County Code 17.16.050*; *Visibility limiting standard*. Restricts visible fugitive dust emissions to leave property boundary lines without taking reasonable dust control measures commensurate with the size and scope of the emission source. Dust emissions shall not reach 20 percent opacity from nonpoint sources when wind speeds are less than 25 miles per hour.
- *Pima County Code 17.16.060*; *Fugitive dust producing activities*. Restricts fugitive dust emissions from land stripping, earthmoving, blasting, trenching, road construction, and other operations and activities. Areas where these operations or activities occur must employ adequate dust suppressant measures until the area becomes permanently stabilized by paving, landscaping, or otherwise. No operations or activities shall leave land in such a state that fugitive dust emissions would violate visibility standards identified in Pima County Code 17.16.050.
- *Pima County Code 17.16.080*; *Vacant lots and open spaces.* Restricts fugitive dust emissions from open areas, including driveways, parking areas, vacant lots, dry washes, and riverbeds. Good modern practices for earthmoving/excavating activities would be implemented. These include using approved dust suppressants or adhesive soil stabilizers, paving, covering, landscaping, continuous wetting, detouring maintenance and repair areas, barring access to maintenance and repair areas, or other acceptable means of reducing significant amounts of airborne dust.
- *Pima County Code17.16.090; Roads and streets*. Restricts fugitive dust emissions from roadways and alleys, including the transportation of materials over those roadways or alleys. Dust and other particulates shall be kept to a minimum by employing the following techniques: temporary paving, dust suppressants, wetting down of roadways, detouring through-traffic, or by other reasonable means.
- *Pima County Code 17.16.100; Particulate materials.* Restricts fugitive dust emissions from nonpoint sources associated with operations such as material crushing, screening, handling, transporting, or conveying. No crushing, screening, handling, transporting or conveying of materials or other operations likely to result in significant amounts of airborne dust would occur without taking reasonable precautions (such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods to cover maintenance and repair areas) to prevent excessive amounts of particulate matter from becoming airborne.
- *Pima County Code 17.16.110; Storage Piles*. Restricts fugitive dust emissions from material stacking, piling, or similar storage methods. Organic or inorganic dust producing material would not be stacked, piled, or otherwise stored without taking reasonable precautions to reduce excessive amounts of particulate matter from becoming airborne, such as chemical stabilization, wetting, or covering. Stacking and reclaiming machinery used near storage piles would be operated at all times to prevent excessive amounts of particulate matter from becoming airborne.
- *Pima County Code 17.12.470; Fugitive Dust Activity Permits.* No person shall conduct, cause, or allow land stripping, earthmoving, blasting, trenching, or road construction without first obtaining an activity permit from the Control Officer.

APPENDIX D

TAA Land Assurance Letter

TUCSON
AIRPORT AUTHORITY
TUCSON INTERNATIONAL AIRPORT • RYAN AIRFIELD

August 8, 2014

Mike Williams
Manager, Phoenix Field Office
Federal Aviation Administration Airports Division
3800 N. Central Avenue
Suite 1025, 10th floor
Phoenix, AZ 85012

RE: Hughes Access Road Relocation Project
Land Use Assurance

Dear Mr. Williams:

In accordance with 49 US Code 47107(a)(10), the Tucson Airport Authority (TAA), as the sponsor for the Tucson International Airport, is hereby providing written assurance that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. This assurance applies to both existing and planned land uses.

This assurance also applies to all land use activities associated with the Hughes Access Road Relocation Project. Although TAA does not have zoning authority, TAA will work closely with other jurisdictions within the City of Tucson and Pima County to ensure appropriate land use regulations are adopted and enforced.

Please contact me if you have questions or need additional information.

Sincerely,

Bonnie A. Allin

Bonnie A. Allin, A.A.E.
President/CEO
Tucson Airport Authority

CC: Peter Ciesla, FAA
Dean Papajohn, PC
Eric Roudebush, TAA
File

7005 South Plumer Avenue, Tucson, Arizona 85756 TEL 520-573-8100 FAX 520-573-8008 www.flytucsonairport.com

APPENDIX E

Section 7 Consultation

U.S Department
of Transportation
**Federal Aviation
Administration**

Western-Pacific Region
Airports Division

Federal Aviation Administration
P.O. Box 92007
Los Angeles, CA 90009-2007

September 5, 2014

Mr. Steven L. Spangle
Field Supervisor
U.S. Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021-4951

Dear Mr. Spangle:

Proposed East Hughes Access Road Relocation Project
Tucson International Airport
Tucson, Pima County, Arizona
Request for Formal Section 7 Consultation

The Tucson Airport Authority (TAA) and the Federal Aviation Administration (FAA) are preparing a federal Environmental Assessment (EA) for the proposed relocation of East Hughes Access Road which will require use of land at Tucson International Airport (TUS). The TAA and the Pima County Department of Transportation (PCDOT) propose to relocate the existing paved, two-lane, undivided section of East Hughes Access Road to the south by approximately 2,500 feet. The proposed new roadway would be approximately 3.9 miles long and require approximately 3 miles of right-of-way through TAA owned land while the remaining portion would be on unincorporated Pima County land.

The purpose of this letter is to initiate formal consultation with U.S. Fish and Wildlife (Service) under Section 7 of the Endangered Species Act (ESA) for the proposed relocation of East Hughes Access Road. We are enclosing a Biological Assessment (BA) prepared by SWCA Environmental Consultants from their Tucson, Arizona office, for the proposed road relocation project that provides a detailed description of the action being considered and addresses potential impacts of the project on federally-listed species and designated critical habitat. Although the segment of the roadway subject to FAA approval is only the portion on TAA land, the BA evaluates the entire roadway alignment.

Project Background

The existing East Hughes Access Road is a two-lane road which supports vehicular traffic in the area south of TUS and the U.S. Air Force property leased to Raytheon Missile Systems. TUS serves 3.6 million passengers annually, with commercial flights from six airlines, and plays an important role in air cargo operations for regional and

international trade in southern Arizona. This area with its access to aviation, two interstate highways, and two rail lines, has been identified through several statewide studies as a primary location for an industrial and logistics location for the region. The existing roadway is also not in compliance with the existing land use at the adjacent Raytheon Missile System facilities. The Raytheon facilities require buffer zones from adjacent public uses, for public safety and security. These buffer zones or safety arcs were designated based on traffic volumes on East Hughes Access Road of 5,000 trips per day. Traffic on the roadway has increased and the existing safety arcs are no longer compliant, requiring the facility to operate under waivers issued by the Department of Defense. To meet the needs of future land use plans and regional economic objectives, and resolve the conflict in land use for the Raytheon facility, the TAA and PCDOT propose to relocate the existing East Hughes Access Road.

Project Description

The existing two-lane East Hughes Access Road is proposed to be relocated approximately 2,500 south and parallel to the existing alignment, between South Nogales Highway and South Alveron Way. The relocated road would remain a two-lane road and be located outside of the buffer zones for the Raytheon facilities and would be compatible with future TAA and Pima County land use plans in the area. The total length of the relocated roadway would be approximately 3.9 miles along a 150 to 170 foot wide corridor. The proposed roadway corridor is estimated to have a direct disturbance area of approximately 106 acres. Since most of the land required for the right-of-way for the relocated road is on TAA property, the FAA will consider actions to approve a release of Federal obligations on airport land for a roadway and approval of an Airport Layout Plan update showing the changes.

The proposed project also includes drainage improvements at 15 locations with reinforced concrete pipe culverts and at 2 locations with reinforced concrete box culverts, which requires a permit from the U.S. Army Corps of Engineers (USACE), due to potential impacts to Waters of the U.S. PCDOT submitted a preconstruction notification of the intent to use a Nationwide Permit 14 (Linear Transportation Projects) of Section 404/401 of the Clean Water Act to the USACE on April 22, 2014. The USACE issued a Nationwide Permit Verification letter dated June 13, 2014, to PCDOT stating that construction of the proposed complies with Nationwide Permit 14 (Linear Transportation Projects), provided the construction is conducted as described in the permit application. The drainage improvements have been designed to balance effective drainage and minimize impacts to vegetation and sensitive species, and facilitate wildlife movement in the project area.

Effects on Federally-listed Species and designated Critical Habitat

The proposed project has been reviewed for its effects on federally listed threatened and endangered species, and designated critical habitat. Based on the analysis contained in the attached BA, FAA has determined that two Federally listed species have a reasonable potential to occur in the project and action areas and are evaluated in the BA: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) and Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*). There is no proposed or designated critical

habitat for either of these species. Although the Sonoran desert tortoise (*Gopherus morafkai*) is a candidate for listing and does not currently receive protection under the ESA, it is included in this BA because a determination regarding the listing of this species is scheduled to be initiated in 2014, with a potential publication date in 2015.

Species-specific avoidance, minimization and compensation measures have been incorporated into the proposed project to address effects on listed species. Project planning and design would limit disturbances to within the project area.

As discussed in the BA, the primary threats to the lesser long-nosed bat are roost site loss or disturbance and impacts to forage availability. No direct effects are anticipated because roosting habitat (i.e., caves, mine, crevices, etc.) is not located within the project or action area. Indirect effects on the lesser long-nosed bat could occur as a result of removing forage plants (i.e., approximately 41 saguaros, of which 14 are mature enough to flower/fruit) from the project area. These direct and indirect effects within the project and action areas are likely to be insignificant as there are an additional 213 saguaros in the 350 acre survey area that surrounds the project area and roosting habitat is not likely to be located within the project area. Saguaros will be protected in place or salvaged and transplanted and mitigated at a 1:1 ratio, including monitoring of all transplanted saguaros for 10 years, and if any transplanted saguaros die within 10-year monitoring period, replacement with 4- to 6-foot-tall saguaros at 1:1 ratio.

After reviewing the current status of these species, the effects of the proposed project, and proposed measures to avoid, minimize and compensate for effects to listed species, and designated critical habitat, the FAA has determined that the project: ***may affect, not likely to adversely affect,*** the lesser long-nosed bat.

The BA evaluates whether the proposed project could affect the Pima pineapple cactus. Based on surveys of the project area, it is estimated that nine Pima pineapple cacti and approximately 70 acres of habitat would be directly affected. Pima County would protect in place as many Pima pineapple cacti and habitat as possible during construction. As compensation for the effects, Pima County would purchase 70 acres of mitigation credits for Pima pineapple cacti at the County's Madera Highlands/Elephant Head properties mitigation bank. Although transplanted individuals have low levels of survival, all of the Pima pineapple cacti that cannot be salvaged would be transplanted and used to promote project-specific research into the viability of transplanting Pima pineapple cacti.

After reviewing the current status of these species, the effects of the proposed project, and proposed measures to avoid, minimize and compensate for effects to listed species, and designated critical habitat, the FAA has determined that the project: ***may affect, likely to adversely affect,*** the Pima pineapple cacti.

The BA also evaluates the effects of the proposed project on the Sonoran desert tortoise. It is possible that individuals of this species could breed, forage, and disperse within the project area because it occurs in the elevational and species' range of the desert tortoise, and the soils and vegetation in the project area may provide habitat for this species. However, there are no reported occurrences of this species within 3 miles of the project area, and no desert tortoise individuals, tracks, or scat were noted during surveys for this

species or during other site visits within the project area. The FAA has determined that the relocation of East Hughes Access Road may impact individuals of the Sonoran desert tortoise but is not likely to result in a trend toward federal listing or loss of viability. This determination is based on the species-specific conservation measures and the conservation measures that have been incorporated into the project design.

FAA seeks the Service's concurrence with our determinations made pursuant to Title 50, Code of Federal Regulations (CFR) Part 402, for the proposed East Hughes Access Road project.

Please call me at (310) 725-3615 or by email at dave.kessler@faa.gov, if you have any questions or need additional information concerning this matter.

Sincerely,

David B. Kessler, AICP
Regional Environmental Protection Specialist

Enclosure: Biological Assessment

cc: PHX-600, TAA, PCDOT

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Biological Assessment for the East Hughes Access Road Relocation Project in Pima County, Arizona

Prepared for

Pima County Department of Transportation

Tucson Airport Authority

Federal Aviation Administration

Prepared by

SWCA Environmental Consultants

September 2014

BIOLOGICAL ASSESSMENT FOR THE EAST HUGHES ACCESS ROAD RELOCATION PROJECT IN PIMA COUNTY, ARIZONA

Prepared for

Pima County Department of Transportation
Public Works Building
201 North Stone Avenue
Tucson, Arizona 85701

Tucson Airport Authority
7005 South Plumer Avenue
Tucson, Arizona 85756

Federal Aviation Administration
Western-Pacific Region, Airports Division
Phoenix Field Office
2800 North 44th Street, Suite 510
Phoenix, Arizona 85008

Prepared by

SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701
(520) 325-9194
www.swca.com

SWCA Project No. 25149

PCDOT Job No. 4HARDR

September 2014

ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game and Fish Department
AIDTT	Arizona Interagency Desert Tortoise Team
ALP	Airport Layout Plan
AZHGIS	Arizona Heritage Geographic Information System
BA	Biological Assessment
COT	City of Tucson
CWA	Clean Water Act
EA	environmental assessment
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HDMS	Heritage Data Management System
NEPA	National Environmental Policy Act
PCDOT	Pima County Department of Transportation
ROW	right-of-way
SWCA	SWCA Environmental Consultants
SWPPP	Stormwater Pollution Prevention Plan
TAA	Tucson Airport Authority
TUS	Tucson International Airport
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Service
WUS	Waters of the United States

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B. Arizona Game and Fish Department's Heritage Data Management System On-line Environmental Review Tool
C. Department of the Army Nationwide Permit Verification Letter (File Number: SPL-2013-00397-DB)
D. Drainage Improvement Locations, Typical Cross Section, Plan and Profile, and Detail Graphics for Culverts
E. U.S. Fish and Wildlife Service's Technical Assistance Letter
F. Saguaro Maps with Locations
G. Pima Pineapple Cactus Data and Maps with Locations
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Figure 4. Typical roadway section. 9

EXECUTIVE SUMMARY

The Tucson Airport Authority (TAA) and the Pima County Department of Transportation (PCDOT) are planning to relocate the existing two-lane section of East Hughes Access Road immediately south of Tucson International Airport (TUS) along and south of the existing East Hughes Access Road between South Old Nogales Highway and South Alvernon Way within the city of Tucson and unincorporated Pima County. The lands within and adjacent to the project area are owned by the TAA, the City of Tucson (COT), the U.S. Air Force (USAF), and Pima County. The majority of the land needed for the proposed Hughes Access Road Relocation Project (proposed project) is owned by the TAA, in accordance with the *2012 TUS Master Plan Update* (TAA 2013). To relocate the roadway, right-of-way and drainage easements would be acquired from the TAA and the COT. The land sought from the TAA for acquisition by PCDOT is federally obligated because it was acquired by the TAA using Federal Aviation Administration (FAA) grants and is shown on the FAA approved Airport Layout Plan (ALP). Therefore, the FAA action on the release and the TUS ALP (2014) amendment constitute a federal action subject to the Endangered Species Act of 1973 (ESA), as amended. In addition, a small portion of the proposed action would occur on a Pima County roadway easement on lands owned by the TAA, the USAF, and the COT. Small portions of these easements would remain.

The purpose of this document is to review and analyze the proposed project in sufficient detail to determine the extent to which the proposed project may affect federally threatened and endangered species and designated or proposed critical habitats protected under the ESA. The most recent U.S. Fish and Wildlife Service (USFWS) species list for Pima County (Appendix A) was reviewed, and on the basis of this review, a search of the Heritage Data Management System (Appendix B), and pertinent literature, it was determined that two threatened or endangered species have a reasonable potential to occur in the project and action areas and thus are included in the biological assessment (BA): lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) and Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*). There is no designated or proposed critical habitat for either of these species. In addition, although the Sonoran desert tortoise (*Gopherus morafkai*) is a candidate for listing and does not currently receive protection under the ESA, it is included in this BA because a determination regarding the listing of this species is scheduled to be initiated in 2014, with a potential publication date in 2015.

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INTRODUCTION

This section describes the proposed project, general location, setting, and consultation history. This biological assessment (BA) was prepared under Title 50 Code of Federal Regulations (CFR) Part 402. The most recent U.S. Fish and Wildlife Service (USFWS) species list for Pima County was reviewed (Appendix A) (USFWS 2014a). On the basis of this review, a search of the Heritage Data Management System (HDMS) (Appendix B) (HDMS 2013), and pertinent literature, it was determined that two threatened or endangered species and one candidate species have a reasonable potential to occur in the action area and thus are included in the BA: lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), and Sonoran desert tortoise (*Gopherus morafkai*). None of these species have designated or proposed critical habitat. For the remaining species listed as threatened or endangered by USFWS for Pima County, the action area is either clearly beyond the known geographic or elevational range of these species and/or it does not contain vegetation or landscape features known to support these species (see SWCA Environmental Consultants [SWCA] 2014:Table 2).

This BA addresses the proposed action, and is prepared in accordance with the legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA). Section 7 of the ESA requires that, through consultation (or conferencing for proposed species) with the USFWS, the proposed action not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat. This BA evaluates the potential effects of the proposed Hughes Access Road Relocation Project (proposed project) on species and critical habitat that are federally listed under the ESA. Specific project design elements are identified that avoid or minimize adverse effects of the proposed project on listed species.

Airport lands within and adjacent to the project area[1] are owned by the Tucson Airport Authority (TAA), the City of Tucson (COT), the U.S. Air Force (USAF) property leased to Raytheon, and Pima County (Figures 1 and 2). The Tucson International Airport (TUS) resides on land that the TAA leases from the COT. Approximately 3.0 miles of the 3.9-mile length needed for the new roadway is owned by the TAA. To relocate the roadway, right-of-way (ROW) and drainage easements would be acquired from the TAA and the COT. The land sought from the TAA for acquisition by the Pima County Department of Transportation (PCDOT) is federally obligated because it was acquired by the TAA using Federal Aviation Administration (FAA) Airport Improvement Program grants and is depicted on the FAA approved Airport Layout Plan (ALP). The FAA's federal actions include approval of a release of federal obligations for the land to be used for the relocated road and a change to the ALP. The FAA, as the lead federal agency for the proposed action, is required to assess the effects of the proposed action on species listed or proposed for listing under the ESA, as well as on proposed and designated critical habitat. An environmental assessment (EA) is also being prepared to evaluate the potential effects for the entire roadway as part of the National Environmental Policy Act (NEPA) process.

Additionally, in order to construct the proposed project, Pima County would require a permit from the U.S. Army Corps of Engineers (USACE). The purpose of the Regulatory Program of the USACE is to protect and maintain the navigable capacity of the nation's waters. The USACE Regulatory Program is committed to protecting the nation's aquatic resources while allowing reasonable development through fair, flexible, and balanced permit decisions. It is the USACE's responsibility to evaluate the Clean Water Act (CWA) Section 404 permit application for impacts to jurisdictional waters of the United States (WUS), including wetlands, and to determine whether to issue a permit for the proposed project.

[1] Throughout this EA, the term "project area" refers to the approximately 106 acres representing the construction footprint (i.e., area of disturbance) and is discussed in more detail in Chapter 2.

Figure 1. State location map.

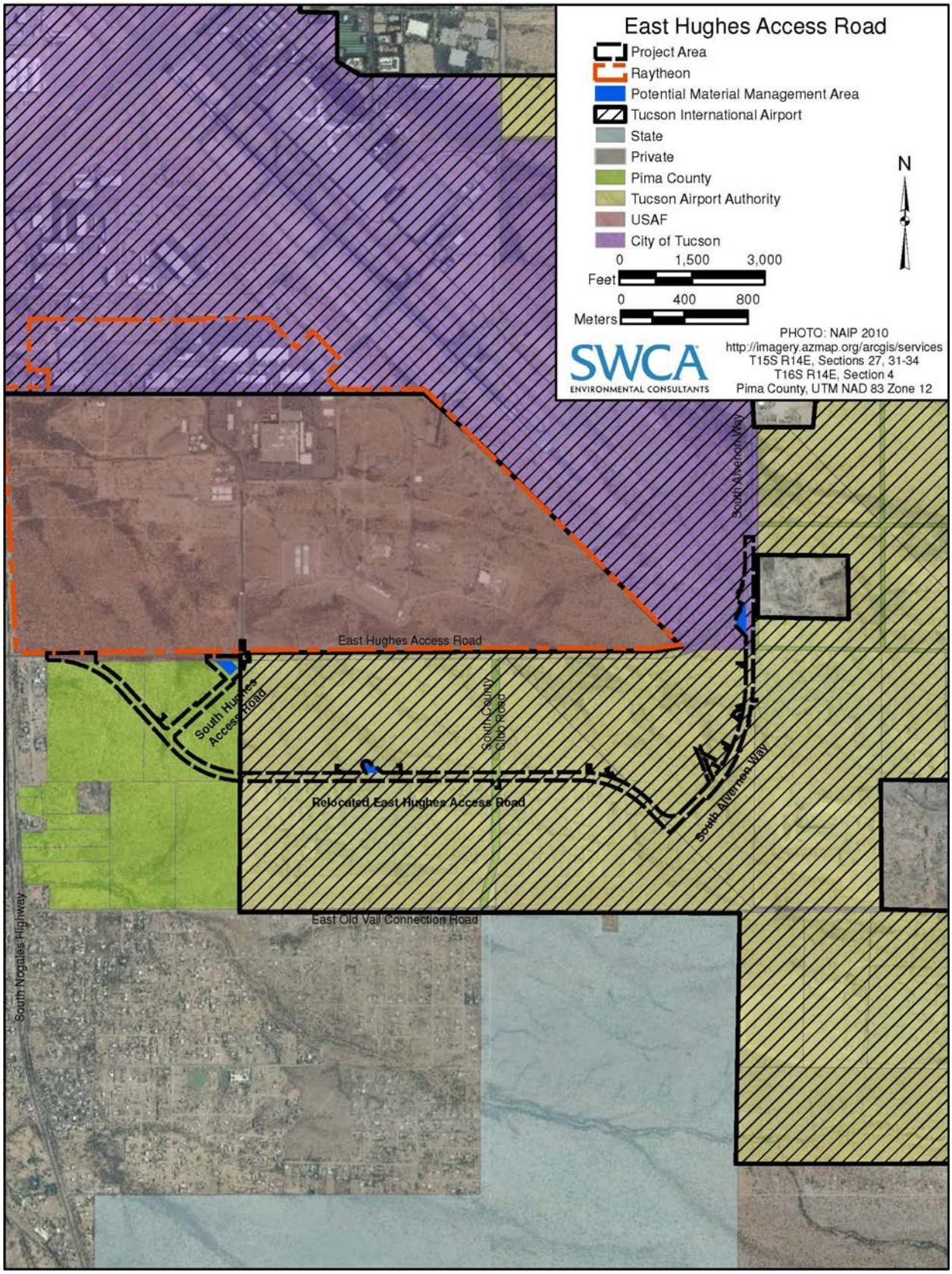

Figure 2. Project area map.

A pre-construction notification of the intent to use a Nationwide Permit 14 (Linear Transportation Projects) of Section 404/401 of the CWA was transmitted to the USACE on April 22, 2014. On June 13, 2014, the USACE issued a Nationwide Permit Verification letter (File Number: SPL-2013-00397-DB) to the PCDOT stating that the construction of the proposed project complies with Nationwide Permit 14, provided the construction is conducted as described in the permit application (Appendix C).

Proposed Action

The TAA and the PCDOT are proposing to relocate the existing paved, two-lane, undivided section of East Hughes Access Road immediately south of TUS from just east of South Old Nogales Highway to South Alvernon Way (see Figures 1 and 2). The proposed project would construct a new two-lane section of East Hughes Access Road approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor. The proposed project is estimated to permanently impact 106 acres. The project would shift current traffic[2] from the existing two-lane alignment to the new location with two lanes. Traffic volumes are not anticipated to significantly increase on the relocated roadway, so Pima County has determined that maintaining the relocated roadway with two lanes is adequate to handle traffic volumes. The project would change the project area from undeveloped land to a two-lane roadway (one lane in each direction).

The TAA's and PCDOT's purpose of the project is to relocate the existing East Hughes Access Road to implement the part of the TUS ALP (2014) that calls for the relocation of East Hughes Access Road, to support local land use plans and regional economic growth objectives by supporting the development of aerospace and defense industry businesses, and to resolve conflicts between current road operations and adjacent land uses. The TAA's and PCDOT's need for the project is for the road to be compatible with TAA's and Pima County's future land use plans and economic growth objectives, to improve revenue and revenue diversity at the TUS, and to comply with existing land uses at the adjacent Raytheon facilities. The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States. The FAA must ensure that the Proposed Action does not impair the safety of aircraft and airport operations at the TUS. The Proposed Action would improve transportation access to and at TUS and would support the safe and efficient use of navigable airspace in the United States.

Acquisition of ROW and drainage easements for land not currently owned by Pima County would be required from the TAA (this land is obligated under FAA grant assurances and subject to a land release and ALP update approval) and the COT. The existing alignment of East Hughes Access Road is located on a series of ROW easements or leases granted by the TAA, the USAF leased property to Raytheon, and the COT. After East Hughes Access Road is relocated, portions of the existing road that are no longer needed would be abandoned or exchanged for like value, and the rights would be restored to original grantors (TAA, USAF, and COT). Land held by the COT is subject to the TAA master lease and would not be removed from the TUS ALP (2014). A small portion of the proposed action is within the existing Pima County roadway easement on lands owned by the USAF and the COT, and portions of these easements would remain.

The project's preliminary estimated cost is $12.7 million. The project would be completely funded by Pima County. This project is included in the *Pima County Economic Development Plan – 2012 to 2014* (Pima County Board of Supervisors 2012). Project construction is anticipated to commence in December 2014, and construction will last approximately 235 days.

[2] Average daily traffic is currently estimated at 14,622 vehicles per day.

Project Description

The proposed project also includes the following construction activities (bulleted items below correspond to numbered call-outs in Figure 3):

1. relocation of existing two-lane undivided roadway and tie-back into East Hughes Access Road and the extension of South Alvernon Way;
2. two 11-foot lanes with 10-foot shoulders on either side of the roadway (6 feet paved and 4 feet graded) (Figure 4);
3. construction of an approximately 0.4-mile-long entry road to Raytheon (i.e., South Hughes Access Road);
4. tie-back of new South Hughes Access Road into existing South Hughes Access Road (i.e., entry road to Raytheon);
5. stripe obliteration and restriping of South Hughes Access Road on USAF property (i.e., entry road to Raytheon);
6. removal of pavement at tie-backs on the west and east ends to prevent access from the relocated East Hughes Access Road to the existing East Hughes Access Road;
7. construction of turn lanes at the intersections of the relocated East Hughes Access Road with South Hughes Access Road, South Country Club Road, and South Alvernon Way;
8. new traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Hughes Access Road;
9. new flashing traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Alvernon Way;
10. relocation of the T-intersection of East Hughes Access Road and South Country Club Road 2,500 feet south of the existing location;
11. relocation of the driveway on South Alvernon Way for the access road to material source pits 160 feet east of the existing location;
12. construction of drainage improvements at 17 locations (Appendix D includes locations of drainage improvements, typical cross section, plan and profile, and detail graphic);
13. removal of 4.1 acres of pavement—0.9 acre of existing East Hughes Access Road and South Alvernon Way and 3.2 acres of existing wildcat roads;
14. potential use of approximately 5 acres for material management areas outside new ROW that the contractor may use for the storage of equipment and materials during construction;[3] and
15. relocation of overhead utilities (i.e., Tucson Electric Power, CenturyLink, and Comcast).

[3] Material management areas are ones that the contractor may use for the storage of equipment during construction. The three material management areas each have different land ownership: Pima County, the TAA, and the COT. The material management areas were chosen in soil types that do not provide habitat for Pima pineapple cactus within the project area (or within disturbed areas where no Pima pineapple cactus were found) and would have minimal impact to saguaros. Although these areas have been identified, it is possible that they will not need to be used because the new ROW is expected to be able to accommodate all the necessary equipment and materials.

Construction Activities

Project planning would restrict disturbances to within the project area (see Figure 2). Impacts to existing vegetation would be minimized in the following ways: project plans would clearly depict project limits, and special provisions would note that contractor must stay within the project limits; initial staking and marking during pre-construction survey to clearly define project limits (i.e., ROW and easement boundaries) in the field and installation of strategically placed preservation fencing around sensitive vegetation (e.g., saguaros, Pima pineapple cactus, and xeroriparian habitat in and near ephemeral drainages) prior to commencing construction activities would distinguish areas for construction from areas for preservation; and maintenance of existing traffic would be limited to the east and west connection points of the project, so the contractor would have more flexible use of the ROW since it does not have to be shared with traffic.

To minimize erosion and sedimentation, and hence stormwater pollution, during and after construction activities, a stormwater pollution prevention plan (SWPPP) would be prepared and implemented (see "Conservation Measures Incorporated into the Project Design" below). Stages of implementation of the SWPPP would be as follows:

- conduct initial staking and marking to identify the areas for construction;
- fence protected/sensitive areas;
- remove incipient vegetation and install temporary erosion controls;
- clear and grub deleterious materials;
- install structural erosion control measures;
- conduct on-site earthwork;[4]
- stabilize, compact, and/or distribute earth and install any temporary erosion-control measures;
- install utilities and cross drainage and any associated post-construction erosion-control measures;
- complete final grading and install permanent seeding and plantings;
- complete final paving; and
- remove any remaining temporary erosion-control measures.

Access to the project area would be from the existing East Hughes Access Road or South Alvernon Way. No detours are anticipated because the new road alignment does not currently carry traffic, and at least one lane on existing roadways will remain open during construction. Access to all adjacent properties would be maintained during construction, and construction activities would be scheduled to avoid disrupting activities at the adjacent properties.

[4] Including but not exclusively limited to rough grading, excavation, and placement of embankments for roads, channels, bridges, and driveways to match horizontal and vertical elevations.

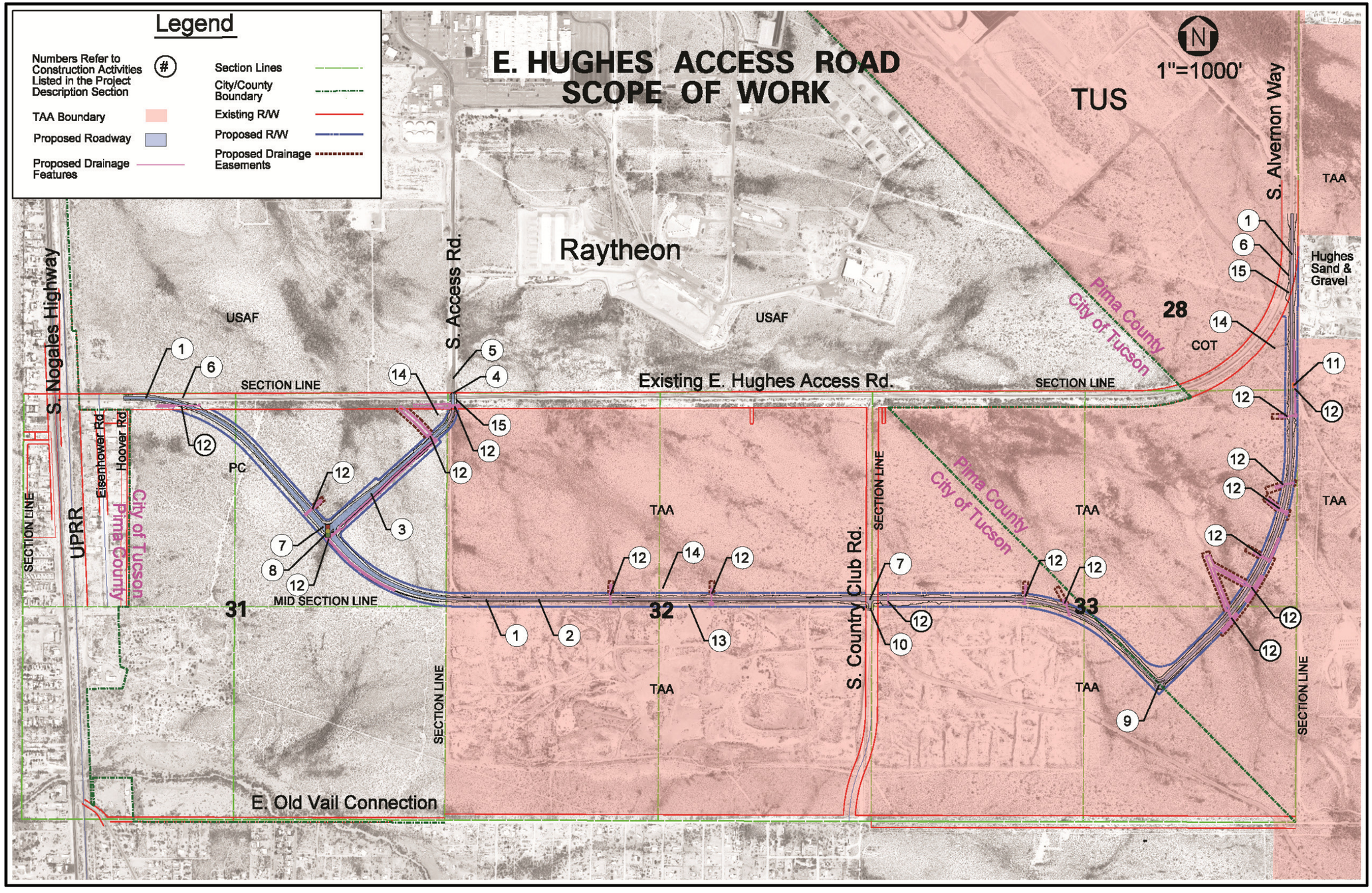

Figure 3. Scope of work.

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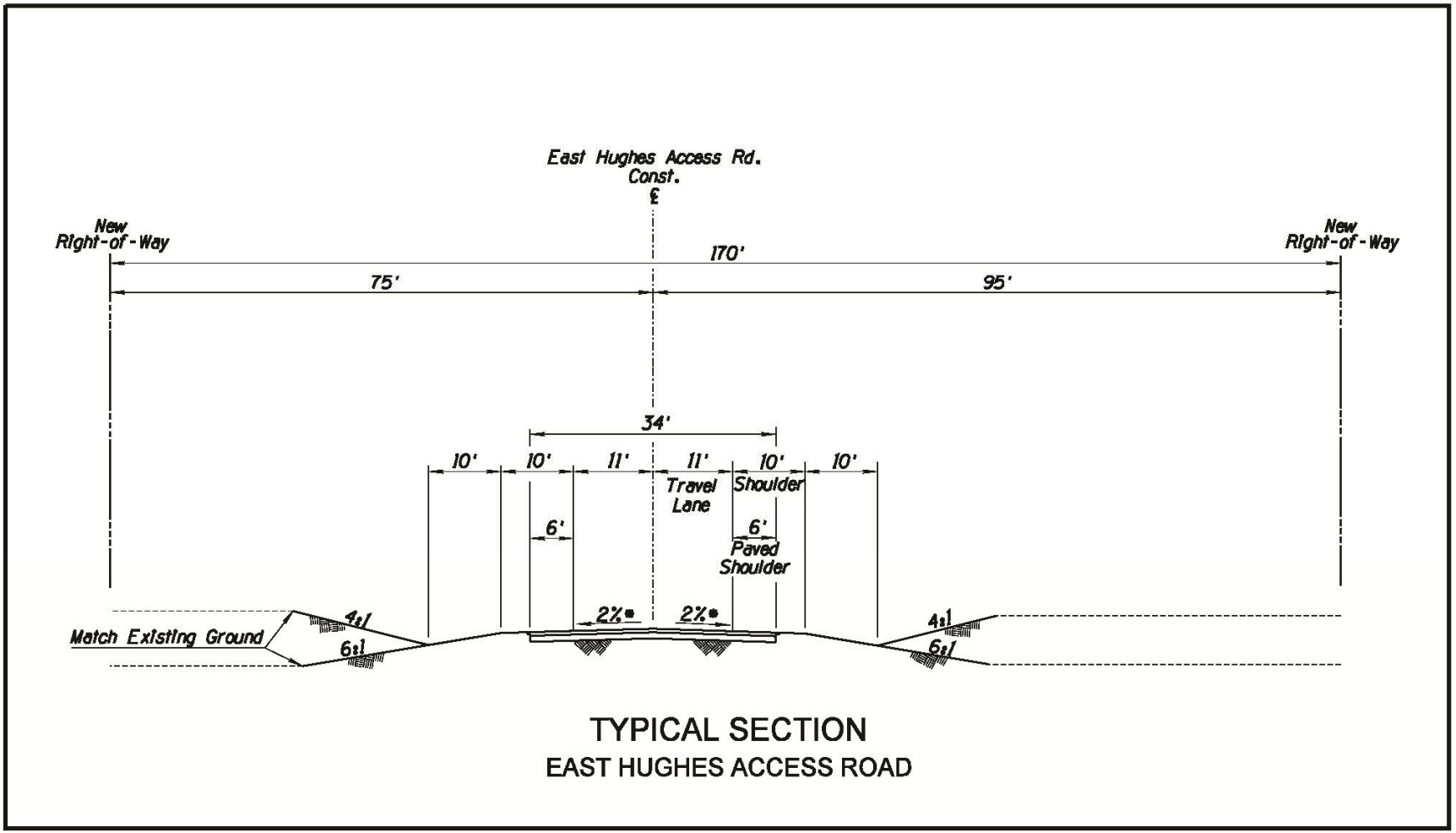

Figure 4. Typical roadway section.

Conservation Measures Incorporated into the Project Design

The following non-species-specific conservation measures have been incorporated into the project design.

Pima County Responsibilities

- Protected native plants within the project will be impacted by this project; therefore, Pima County will send the notification to the Arizona Department of Agriculture at least 60 calendar days prior to the start of construction.
- Pima County shall prepare a SWPPP that meets the requirements of the current Arizona Pollutant Discharge Elimination System general permit for Discharge from Construction Activities to WUS.

Pima County Design Responsibilities

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.
- The new lighting that will be installed at the new East Hughes Access Road and South Alvernon Way intersection and the new East Hughes Access Road and South Hughes Access Road will be low-voltage, directional lighting.
- Culverts have been designed consistent with the recommendations to improve wildlife connectivity in the Arizona Game and Fish Department's (AGFD's) study of crossing structure designs that facilitate wildlife movements (AGFD 2011) (see Appendix D).

Contractor Responsibilities

- The contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction consistent with PCDOT's Special Provision 201-3.04, *Noxious and Invasive Vegetation*.
- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity. This will include seeding of approximately 68 acres of disturbed areas with two seed mixes for the first application and approximately 17 acres for the second application,[5] including areas where pavement removal of existing roads would occur.
- The contractor shall follow the PCDOT's standard specifications for dust suppression during construction (Section 207) and shall obtain an air quality permit for dust from the Pima County Department of Environmental Quality.
- The contractor shall certify that the SWPPP prepared by Pima County meets the requirements of the currently Arizona Pollutant Discharge Elimination System general permit for Discharge from Construction Activities to WUS.

[5] Second seeding application will occur close to the conclusion of the project in areas that have not been previously seeded and/or in areas where the first seeding application was not successful.

Project Area and Setting

The *project area* is defined as all areas in which any ground disturbance would take place as a result of the proposed project, including the new ROW, drainage easements, material management areas, areas where existing pavement will be removed, and areas for utility relocations, etc., associated with the project (see bulleted list in the "Project Description" section for more details). The project area acreage, expected to result in direct impacts owing to project activities, is 106 acres. The proposed project is located along and south of the existing East Hughes Access Road between South Old Nogales Highway and South Alvernon Way within the city of Tucson and unincorporated Pima County (see Figures 1 and 2). The proposed project is located in Sections 28 and 31–33, Township 15 South, Range 14 East, Gila and Salt River Baseline and Meridian, on the 1984 Tucson Southwest, Pima County, Arizona, U.S. Geological Survey 7.5-minute topographic series map within the city of Tucson and unincorporated Pima County. The lands within and adjacent to the project area are owned by the TAA, the COT, the USAF, and Pima County.

Action Area

The *action area* is defined as the project area plus a larger, surrounding area that may experience direct or indirect temporal and spatial impacts from the project. The action area for this analysis is based on 1) the project area as described above; and 2) areas outside the project area that may be affected by noise, dust, light pollution, and other construction and post-construction activities. The action areas for the lesser long-nosed bat, Pima pineapple cactus, and Sonoran desert tortoise are defined by a 1-mile buffer around the project area based on the anticipated effects of the proposed project and discussions with the USFWS (personal communication, Scott Richardson, USFWS, 2014). Temporally, the potential on-site and off-site impacts resulting from the proposed project encompass all the activities associated with construction and post-construction seeding, and the temporal analysis period includes 12 months of project construction.

USFWS Coordination

A meeting between Pima County and USFWS was held on August 21, 2013, to discuss the proposed project. The USFWS agreed that two threatened or endangered species (lesser long-nosed bat and Pima pineapple cactus) occur or have a reasonable potential to occur in the action area. On November 27, 2013, Pima County submitted a draft biological evaluation to and requested technical assistance from USFWS related to the proposed action and the potential effects on federally listed species associated with the proposed project. In response to Pima County's request, on January 16, 2014, USFWS provided a technical assistance letter with information on the lesser long-nosed bat, Pima pineapple cactus, and Sonoran desert tortoise (Appendix E) (USFWS 2014b).

ENVIRONMENTAL SETTING

Existing Land Uses

The project area is currently undeveloped but is zoned as general industrial (in Pima County) and as park and heavy industrial (in Tucson). However, there are several urban uses surrounding the project area. The lands to the north of the project area are developed and include USAF property under use by Raytheon (defense and aerospace systems) and the Tucson International Airport. The area south was previously under use as a sand and gravel mine, and the property to the northeast is still used for sand and gravel operations. The existing East Hughes Access Road has no existing street corridor lighting, but there are overhead utilities within the existing street corridor.

Biophysical Features, Geology and Soils

The project area is located in the Santa Cruz River valley, which is bounded by the Santa Catalina and Tortolita Mountains on the northeast and by the Silverbell Mountains on the southwest, near Tucson. The project area elevation ranges between 2,610 and 2,680 feet above mean sea level (amsl). The topography is relatively flat (0% to 8%) and gently slopes downward from southeast to northwest. Drainages in the area are ephemeral, and stormwater flows in a general northwest direction from Hughes Wash and other unnamed washes into the Santa Cruz River (approximately 3.5 miles northwest of the project area). The project area contains numerous soil types, including various combinations of Cave, Hantz, Sahuarita, Stagecoach, and Yaqui soils. In general, these soil types are fine to very gravelly sand loams and are characterized as having a mixed-alluvium parent material on fan terraces, alluvial fans, swales, or floodplains (U.S. Department of Agriculture 2014).

Vegetation Communities

The project area is located within the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). Xeroriparian vegetation along and within the ephemeral washes is dominated by velvet mesquite (*Prosopis velutina*) and yellow palo verde (*Parkinsonia microphylla*) in the overstory and whitethorn acacia (*Acacia constricta*), wolfberry (*Lycium* sp.), and graythorn (*Ziziphus obtusifolia*) in the midstory. Vegetation associated with upland areas is relatively undisturbed and is dominated by creosote bush (*Larrea tridentata* var. *tridentata*). Other plant species that occur include saguaro (*Carnegiea gigantea*), ocotillo (*Fouquieria splendens*), cholla (*Cylindropuntia* spp.), barrel cactus (*Ferocactus wislizeni*), desert zinnia (*Zinnia acerosa*), desert marigold (*Baileya multiradiata*), paper flower (*Psilostrophe cooperi*), globemallow (*Sphaeralcea* sp.), galleta grass (*Pleuraphis* sp.), bush muhly (*Muhlenbergia porteri*), deergrass (*M. rigens*), and buffelgrass[6] (*Pennisetum ciliare*). No aquatic habitats (e.g., wetlands, springs, stock tanks, etc.) or broadleaf deciduous riparian vegetation communities occur in the project area.

[6] This invasive grass species is especially concentrated in the southern portion of TAA property in the vicinity of the proposed project. TAA's buffelgrass eradication plan includes recent surveys (2012 and 2013) and treatments (2013) with herbicide. TAA is scheduled to treat buffelgrass on TAA property (including the areas of the existing and proposed East Hughes Access Roads) in summer 2014 and 2015 (personal communication from E. Roudebush, TAA, to D. Papajohn, PCDOT, February 2014).

FEDERALLY LISTED SPECIES AND DESIGNATED OR PROPOSED CRITICAL HABITAT

This section identifies federally listed species (under the ESA) that may occur or are known to occur in the project area. As previously mentioned, a meeting between Pima County and USFWS was held in August 2013 to discuss the proposed project, and it was determined that two threatened or endangered species occur or have a reasonable potential to occur in the project area. In addition, USFWS provided technical assistance and agreed that the Sonoran desert tortoise, a candidate species, has reasonable potential to occur in the project area.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuenae*)

Listing Status

The lesser long-nosed bat was listed as endangered in 1988 without critical habitat (USFWS 1988), and a recovery plan was completed in 1997 (USFWS 1997). The USFWS recently (September 9, 2013) published a 90-day finding in response to a petition that warranted consideration to downlist the species to "threatened" based on the analysis and recommendations contained in a 5-year review of the lesser long-nosed bat, which indicates that the species may be more abundant than was known at the time of listing (USFWS 2013). USFWS is currently initiating a review of the status of this species to determine whether the respective actions of delisting and reclassifying are warranted.

Recovery Plan

No recovery units or management areas were developed as part of the 1997 recovery plan; however, the plan states that the lesser long-nosed bat will be considered for downlisting to threatened once three major maternity roosts and two post-maternity roosts in the United States and three maternity roosts in Mexico have remained stable or increased in size for at least 5 years, following the approval of the Recovery Team (USFWS 1997). Following a 5-year review of the status of lesser long-nosed bat, USFWS determined that although lesser long-nosed bat populations do not currently meet the definition of "endangered," the protection afforded by the ESA is warranted because of the continued vulnerabilities of key roost sites (USFWS 2007b).

Taxonomy

The lesser long-nosed bat was originally listed as *Leptonycteris sanborni*, Sanborn's long-nosed bat (USFWS 1988). Wilkinson and Fleming (1996) support the classification of this bat as *Leptonycteris curasoae*. They further define two subspecies, *L. c. curasoae* (found in the southern portion of the range) and *L. c. yerbabuenae* (found in the northern portion of the range). Some researchers support the raising of *L. c. yerbabuenae* to specific status as *Leptonycteris yerbabuenae* (Cole and Wilson 2006). However, USFWS currently classifies the listed entity as *Leptonycteris c. yerbabuenae*. Information gathered during the 5-year status review indicates that additional investigation into the taxonomy of the lesser long-nosed bat is warranted (USFWS 2007b).

Threats and Limiting Factors

The primary threats to the lesser long-nosed bat are roost site loss or disturbance and impacts to forage availability (USFWS 2007b). Other threats that have contributed to the current endangered status of the species include roost disturbance and deterioration, border activities, recreation, vandalism, fire, vampire bat (*Desmodus rotundus*) control, mine closures, forage availability, and the effects of climate change (i.e., decreased precipitation and water resources and changes in flowering phenology of forage plants).

Habitat

In the United States, suitable lesser long-nosed bat habitat includes desert grasslands and shrublands up to the oak transition zone; plant communities typically occupied by the species are paloverde-saguaro, semidesert grassland, and oak woodland (USFWS 1997). A suitable day roost, typically a cave or mine, is probably the most important habitat requirement. However, potentially suitable roosts must be within reasonable foraging distances of sufficient amounts of required foods (the nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by columnar cacti). In Arizona, four species of paniculate agaves [Palmer's agave (*Agave palmeri*), Parry's agave (*A. parryi*), desert agave (*A. deserti*), and amole (*A. schotti*)] and two columnar cacti [saguaro cactus and organ pipe cactus (*Stenocereus thurberi*)] provide the main food sources for this nectivorous bat. The columnar cacti occur in lower-elevation areas of the Sonoran Desert region while the paniculate agaves are found primarily in higher-elevation areas, such as desert grasslands, shrublands, and montane habitats. Concentrations of food resources for this species are patchily distributed and available seasonally; cactus flowers and fruits are available during the spring and early summer, whereas blooming agaves are primarily available during mid- to late summer (typically from July through early October).

Foraging areas experiencing regular, ongoing use, based on nectar and pollen production, may be of particular importance to the lesser long-nosed bat, as they appear to select areas with evidence of high resource abundance in previous years (old floral stalks), suggesting site fidelity to particular agave stands (USFWS 2007b). A reduction in, or further fragmentation of, agave populations could have serious effects on bat behavior, forcing individual lesser long-nosed bats to travel farther, to roost in suboptimal situations, or to compete with one another for food at remaining plants. These effects likely would be especially evident during years of low flower production, when energy expended by bats is appreciably higher.
The lesser long-nosed bat is known to fly long distances from occupied roost sites to foraging sites; night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at distances of up to 15 miles, and in Mexico up to 38 miles. Lesser long-nosed bats have been documented using hummingbird feeders many miles away from the closest potential roost site, including during the winter in Tucson (Lowery et al. 2009). Lesser long-nosed bat visitation rates to individual agave plants appear to increase as the number of flowering umbels per plant increase and where blooming progresses to mid-inflorescence, and foraging rates appear to decrease as blooming moves to the top of plants (USFWS 2007b).

Lesser long-nosed bats roost in caves and abandoned mines and tunnels (USFWS 1988). Lesser long-nosed bats are known to "roost-switch," possibly in response to forage availability, which makes the small number of known roosts potentially significant to the population (USFWS 2007b). A colony of bats may move among several roost sites, and they may require multiple roost sites to meet their foraging and reproductive needs (Cole and Wilson 2006). The lack of, or presence of few, lesser long-nosed bats at a roost at one time does not indicate that bat numbers have declined or mean that the roost site is insignificant (USFWS 2007b). The number of known roosts is limited; therefore, the loss of even one or two key roost sites could threaten the population.

Reproductive Biology

In Arizona, lesser long-nosed bat roosts are typically occupied from April to as late as early November (Slauson 2000), although the species has been recorded at hummingbird feeders in Tucson during the winter (Lowery et al. 2009). During spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in the southwestern portion of the state at low elevations near concentrations of flowering columnar cacti (USFWS 2007b). Maternity roosts are generally located in natural caves or abandoned mines. Maternity colonies disband in July and August after the young are volant, and adult males arrive to join females and young at the time when there is a decline in food resources around maternity roosts. A coincidental increase in blooming agaves results in most females and young moving north and east to late summer roosts, with some moving to higher elevations (up to more than 6,000 feet amsl), primarily in southeastern Arizona near high concentrations of blooming paniculate agaves, where they feed on the nectar and pollen of agave flowers. Results of a recent study indicate that bats may be more abundant in the Tucson Basin in late summer and fall than in spring and early summer (Lowery et al. 2009). However, dates of these seasonal movements appear to vary from one year to the next (USFWS 1997).

Rangewide Distribution and Abundance

The lesser long-nosed bat is found from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador (USFWS 1997). There were 17 known major lesser long-nosed bat roost sites in Arizona and Mexico in the early 1990s, and 12 major maternity roost sites. Based on surveys conducted in 1992 and 1993, it was estimated that more than 200,000 bats occupied 16 of the 17 sites and that the maternity roosts were occupied by more than 150,000 bats. Current population numbers of lesser long-nosed bats exceed the levels known and recorded at the time of listing in 1988 (USFWS 2007b). Numbers of lesser long-nosed bats at most of the roost sites in both the United States and Mexico are stable or increasing. However, the number of known roost sites has not increased significantly.

Arizona Distribution and Abundance

In southern Arizona, lesser long-nosed bat roosts have been found from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County), southeast to the Chiricahua Mountains (Cochise County), and south to the international boundary (USFWS 2008a). Individuals have also been observed near the Pinaleño Mountains (Graham County) and as far north as Phoenix and Glendale (Maricopa County) and from far southwestern New Mexico in the Animas and Peloncillo Mountains (Hidalgo County) (USFWS 1997). There are three known lesser long-nosed bat maternity roosts (Copper Mountain, Bluebird, and Old Mammon) and approximately 40 total lesser long-nosed bat roosts in Arizona (USFWS 2007b). Population estimates at Arizona roosts (maternity and post-maternity) were identified in the *Lesser Long-nosed Bat Recovery Plan* (USFWS 1997).

According to USFWS (2007b), numbers provided do not accurately represent the total number of lesser long-nosed bats in Arizona for the following reasons: 1) counts include a combination of maternity roosts and late-summer roosts; 2) only those roosts identified in the *Lesser Long-nosed Bat Recovery Plan* are monitored; 3) multiple counts at each roost each year are not conducted; and 4) roost-monitoring experience indicates that developing a definitive population estimate for this species is difficult. Bats found in maternity roosts early in the year could occupy late-summer roosts, resulting in double counting of some individuals. Furthermore, the number of lesser long-nosed bats at any given roost fluctuates considerably each year and among years.

In addition, researchers have found increasing, stable populations at roost sites not identified for monitoring in the *Lesser Long-nosed Bat Recovery Plan*, including steady increases in numbers of lesser long-nosed bats at roost sites on Fort Huachuca in the Huachuca Mountains, based on monitoring over the past 10 years (USFWS 2007b). Known lesser long-nosed bat maternity roosts are all more than 75 miles from the proposed project footprint. However, known major post-maternity roosts, including Patagonia Bat Cave and State of Texas, are within about 40 miles of the proposed project footprint, and several small post-maternity roosts are closer.

Status and Distribution in the Project Area

SURVEY HISTORY

No species-specific surveys have been conducted for the purposes of this project. However, surveys for saguaros, a forage plant for this species, were conducted within a 350-acre survey area (hereafter referred to as the "survey area") surrounding the project area in April and November 2013 (300 acres were surveyed in April, and an additional 50 acres were surveyed in November) (see Appendix F for maps).

HABITAT EVALUATION AND SUITABILITY

The project area occurs in the elevational and geographical range of the lesser long-nosed bat; however, there are no reported occurrences of this species within 3 miles of the project area (Arizona Heritage Geographic Information System [AZHGIS] 2013), and the project area is not likely to contain any potential roosts. There are no known lesser long-nosed bat maternity roost sites in this portion of the Santa Cruz River valley: the closest known active maternity roost is the Old Mammon Mine (Krebbs and Petryszyn 2002), located in the Slate Mountains more than 60 miles northwest of the project area. The nearest known postmaternity roost is located approximately 20 miles southeast of the project area in the Santa Rita Mountains (Buecher et al. 2012; Buecher et al. 2010, 2011; WestLand Resources, Inc. 2009), and there are others in the Santa Catalina and Rincon Mountains (see Appendix E) (USFWS 2014b). The project area is in the Arizona Upland subdivision of the Sonoran Desert scrub biotic community and includes vegetation typically found in lesser long-nosed bat habitat. Although there are no agaves in the project area, 254 saguaros of varying sizes were inventoried in the survey area. Of these saguaros, approximately 85 (33%) are at least 8 feet tall and thus are likely to flower/fruit; these may provide forage resources for lesser long-nosed bats within the project area. Forty-one saguaros were inventoried within the 106-acre project area, of which 14 (34%) are ≥ 8 feet tall (see Appendix F for maps).

Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*)

Listing Status

Pima pineapple cactus was listed as an endangered species on September 23, 1993 (USFWS 1993), without critical habitat. A 5-year review, completed in 2007, recommended no change to the Pima pineapple cactus classification as an endangered species (USFWS 2007a).

Taxonomy

Three subspecies are currently recognized within *C. robustispina* (USFWS 2007a). The three Pima pineapple cactus subspecies are found in the following general areas: *C. robustispina* ssp. *robustispina* (= *C. scheeri* var. *robustispina*) is found in south-central Arizona (Pima and Santa Cruz Counties) and

northern Sonora, Mexico; *C. robustispina* ssp. *uncinata* is found in Cochise County, Arizona, to Doña Ana County, New Mexico, El Paso County, Texas, and northern Chihuahua, Mexico; and *C. robustispina* ssp. *scheeri* is located in Eddy County, New Mexico, south-central Texas, and into Chihuahua and Coahuila, Mexico. Baker (2004) found distinct geographical gaps between Pima pineapple cactus and the other subspecies, which occur in southeastern Arizona, New Mexico, and Texas, and that the subspecies are morphologically coherent within their respective taxa. The geographical and morphological work completed by Baker supports the idea that the subspecific groups within *C. robustispina* are discrete and merit separate taxonomic status as subspecies (USFWS 2007a).

Threats and Limiting Factors

Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographical distribution and species rareness, illegal collection, and difficulties in protecting areas large enough to maintain functioning populations (USFWS 1993). Residential and commercial developments are the greatest threats to Pima pineapple cactus and its habitat; other threats include habitat loss and fragmentation, competition with nonnative species, loss of the existing seed bank, grazing, illegal plant collection, prescribed fire, mining, and inadequate regulatory mechanisms (USFWS 1993, 2007a, 2008b). Habitat in the southern portion of the Altar Valley is now dominated by Lehmann lovegrass (*Eragrostis lehmanniana*), and it is hypothesized that fire-induced mortality of Pima pineapple cactus increases with Lehmann lovegrass density (USFWS 2007a). Buffelgrass, a nonnative grass, is now common in vacant areas in the city of Tucson and along roadsides, notably in the ROWs along Interstate 10 and State Route 86, and may also pose a threat to Pima pineapple cactus.

Recent studies have demonstrated that transplanted individuals have low levels of survival, and past efforts have had only limited success. Therefore, transplanting Pima pineapple cactus may not contribute significantly to the overall population and is not considered a viable conservation measure. Landownership patterns within the range of this species in Arizona complicate the protection of habitat for and individuals of this species: approximately 10% of potential habitat is on federal land (most of which is either at the edge of the plant's range or in scattered parcels), and the remaining 90% is on tribal, state, and private lands (USFWS 2012a). Finally, the effects of climate change (i.e., decreased precipitation and water resources) may result in changes in flowering phenology of these plants.

Habitat

In general, Pima pineapple cactus is found in vegetation communities characterized as either Sonoran desertscrub (Arizona Upland subdivision) or semidesert grassland, or a combination of the two, and it is often associated with the following shrub species: desert zinnia (*Zinnia* sp.), snakeweed (*Gutierrezia sarothrae*), burroweed (*Isocoma tenuisecta*), and buckwheat (*Eriogonum* spp.) (USFWS 2007a). Within its relatively limited range, Pima pineapple cactus generally grows on slopes less than 10% and along the tops (upland areas) of alluvial bajadas at elevations between 2,360 and 4,000 feet amsl (USFWS 2007a, 2008b). Pima pineapple cactus occurs in shallow to deep, silty to rocky soils, with a preference for silty to gravelly deep alluvial soils, which are primarily composed of granitic parent materials and contain little rock or clay components (Ecosphere Environmental Services, Inc. 1992; Mills 1991; Phillips et al. 1981).

Reproductive Biology

Little is known about the reproductive biology of Pima pineapple cactus (USFWS 2007a). Recruitment may be triggered by the quality and timing of precipitation and possibly temperature. However, there is little evidence to support this claim. A recent study of pollination concluded that the major pollinator is *Diadasia rinconis*, a ground-nesting, solitary, native bee, and that Pima pineapple cactus is an obligate out-crosser (not self-pollinating), so plants need to be within approximately 2,000 feet of each other in order to facilitate effective pollination (USFWS 2007a) or 300 to 3,000 feet of each other to facilitate effective pollination (McDonald 2005; McDonald and McPherson 2005). The sole presence of Pima

pineapple cactus may not be enough to attract pollinators; pollination appears to be more effective when other species of native cacti are near areas supporting Pima pineapple cactus, as *Diadasia rinconis* also pollinate other species of native cacti such as cholla, prickly pear (*Opuntia* spp.), barrel cactus, hedgehog (*Echinocereus* spp.), saguaro, and beehive (other *Coryphantha* spp.).

The fruit is green, ellipsoid, succulent, sweet, and indehiscent, and is eaten and dispersed by a variety of small to medium animals (e.g., rabbits, rodents, birds, and insects). However, it is unknown how successful they are at dispersing the seeds of this cactus (Ecosphere Environmental Services, Inc. 1992; McDonald 2005; Roller 1996). Potential distances of Pima pineapple cactus seed dispersal are unknown. Therefore, the amount of genetic information exchanged between physically distant Pima pineapple cactus subpopulations is also unknown.

Rangewide Distribution and Abundance

Pima pineapple cactus occurs in southeast Arizona and northern Sonora, Mexico. However, no significant populations have been documented in Sonora or elsewhere in Mexico, and it is difficult to measure abundance and population trends for this species (USFWS 2007a). A recent Pima pineapple cactus population estimate of 100,000 to 150,000 was submitted to the USFWS as part of the 5-year review effort for the species (WestLand Resources, Inc. 2004). However, this estimate was not considered reliable because of numerous issues (USFWS 2007a). There are distinct geographic gaps between the distribution of this subspecies and that of the nearest subspecies in New Mexico.

Arizona Distribution and Abundance

In Arizona, Pima pineapple cactus is found south of Tucson, in Pima and Santa Cruz Counties, distributed at very low densities throughout the Altar and Santa Cruz Valleys between the Baboquivari Mountains to the west and the Santa Rita Mountains to the east (USFWS 2007a). The USFWS does not know how many acres of suitable Pima pineapple cactus habitat are currently available, or how many acres existed historically, or why numerous acres of apparently suitable habitat within Pima and Santa Cruz Counties are currently unoccupied by this species (USFWS 2007a, 2009). Conservation banks have been established for this species: in the Altar Valley and south of Green Valley, 530 acres are under conservation easement by Pima County; and there are 131.6 acres in the Palo Alto Ranch Conservation Bank on a private ranch in the Altar Valley. Additionally, there are other blocks of land that have been set aside or that are under conservation easements and are managed specifically for this species (USFWS 2010a).

Status and Distribution in the Project Area

SURVEY HISTORY

In April and November 2013, SWCA conducted a pedestrian survey for Pima pineapple cactus within the 350-acre survey area surrounding (and including) the project area (300 acres were surveyed in April, and an additional 50 acres were surveyed in November) in accordance with the survey protocol recommended by USFWS. Survey coverage was accomplished using a modification of the Pima pineapple cactus survey techniques in which surveyors spaced approximately 6 m apart made one pass over suitable areas within the survey area surrounding the project area. Thirty Pima pineapple cacti were detected during these surveys (and while conducting other surveys in the project area [i.e., native plant and Sonoran desert tortoise]), of which nine are within the project area (see Appendix G for data and maps).

HABITAT EVALUATION AND SUITABILITY

The project area lies within the current distribution (USFWS 2008b) and elevational range of Pima pineapple cactus (USFWS 2005), there are reported occurrences of this species within 3 miles of the project area (AZHGIS 2013), and individuals were detected during the survey of the project area. Further, the project area contains the following plant species associated with Pima pineapple cactus: mesquite, creosote bush, cholla, and barrel cactus. Finally, the soils and slopes in the project are typical of those found in Pima pineapple cactus habitat, and the project area is in the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). Within the project area, Pima pineapple cactus is found growing in two soil types: Sahuarita soils, Mohave Soils, and urban land with 1% to 5% slopes; and Stagecoach-Sahuarita Association with 1% to 8% slopes. There are approximately 250 acres of these soils types (i.e., Pima pineapple cactus habitat) within the survey area that was surveyed for this species and approximately 70 acres of Pima pineapple cactus habitat within the 106-acre project area (see Appendix G for maps).

Sonoran Desert Tortoise (*Gopherus morafkai*)

Listing Status

The Mojave population (west and north of the Colorado River) was listed as threatened under the ESA on April 2, 1990 (USFWS 1990). In 1991, the USFWS ruled that listing the Sonoran population (also *G. agassizii* at the time) (south and east of the Colorado River) was not warranted (USFWS 1991). After an extensive status review of the Sonoran desert tortoise, the USFWS determined in December 2010 that the population warrants protection under the ESA but is precluded by the need to address other higher priorities, so the species was added to the list of candidates for ESA protection (USFWS 2010b). A determination regarding the listing of this species is scheduled to be initiated in 2014, with a potential publication date in 2015 (see Appendix E) (USFWS 2014b).

Taxonomy

A recent study of DNA evidence and biological and geographical distinctions has determined that the desert tortoise (*G. agassizii*), which was thought to be one species for the past 150 years, now includes two separate and distinct species (Murphy et al. 2011): tortoises west and east of the Colorado River are two separate species. The newly recognized species has been named Morafka's desert tortoise (also referred to as Sonoran desert tortoise) (*G. morafkai*) and represents populations naturally found east and south of the Colorado River, from Arizona extending into Mexico, where as the originally recognized species, the Agassiz's desert tortoise (also referred to Mohave desert tortoise) (*G. agassizii*) is found west and north of the Colorado River in Utah, Nevada, northern Arizona, and California.

Threats and Limiting Factors

In the early 1980s, an upper respiratory tract disease began to cause a notable population decline of the desert tortoise in Arizona, California, and Nevada (Arizona Interagency Desert Tortoise Team [AIDTT] 2000). Additional threats to the 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" (USFWS 2012b); and climate change (i.e., decreased precipitation and water resources and increased evapotranspiration) (Lenart 2007).

Habitat

The Sonoran desert tortoise occurs primarily on rocky slopes and bajadas, at elevations below 7,800 feet amsl (HDMS 2013; USFWS 2014a). The species is most often found in paloverde-mixed cacti associations, and it may occur, but is less likely to occur, in desert grassland, juniper woodland, and interior chaparral habitats, and even pine communities (Averill-Murray and Klug 2000). Desert tortoises have flattened front limbs adapted for digging underground burrows to escape the heat in the summer and the cold in the winter (AIDTT 2000): adequate shelter is one of the most important habitat features of tortoises in the Sonoran Desert (HDMS 2013). Tortoises require loose soil to excavate (usually shallow) burrows below rocks and boulders, but they may also use rock crevices. Occasionally, they burrow under vegetation; less often, they dig soil burrows on more or less open slopes. They also use caliche caves in incised wash banks. They will also rest directly under live or dead vegetation without constructing a burrow. Washes and valley bottoms may be used for dispersal in some areas (USFWS 2013). Sonoran desert tortoises eat a variety of annual and perennial grasses, forbs, and succulents, including dicot annuals, grasses, herbaceous perennials, trees and shrubs, subshrubs/woody vines, and succulents (HDMS 2013).

Reproductive Biology

The desert tortoise is a land-dwelling, herbivorous turtle with a brown shell (carapace) ranging from 8 to 15 inches long (HDMS 2013; USFWS 2014). They reach sexual maturity at 10 to 20 years of age and mate during the summer monsoon season; females usually lay one clutch containing 3 to 12 (usually 6) eggs (HDMS 2013). Females lay their eggs inside burrows that have adequate soil development and usually remain at the nest to defend the eggs against predators. More females reproduce in years with more recent rainfall and vegetation available for forage.

Rangewide Distribution and Abundance

The Sonoran desert tortoise is found east and south of the Colorado River, from Arizona extending into Mexico (Murphy et al. 2011).

Arizona Distribution and Abundance

Historically, this species was found in suitable habitat south and east of the Colorado River in Arizona in every county except for Navajo, Apache, Coconino, and Greenlee (USFWS 2012b). The Sonoran desert tortoise has been documented as far northwest as locations near Pearce Ferry in Mojave County, to the south to Mexico, and at many scattered locations in between (AIDTT 2000). The northeasternmost Sonoran desert tortoise records in Arizona are from along the Salt River near Roosevelt Lake in Gila County; the easternmost substantial Sonoran desert tortoise populations have been documented in the middle San Pedro River drainage in Cochise County; and Sonoran desert tortoises have been found as far southwest as the Barry M. Goldwater Range, Yuma Proving Ground, and the Cabeza Prieta National Wildlife Refuge (HDMS 2013).

Status and Distribution in the Project Area

SURVEY HISTORY

In accordance with AGFD (2010) and AIDTT (Averill-Murray 2000) guidance, species-specific surveys were conducted for the purposes of this project within the 106-acre project area in during the cooler morning hours in mid-June 2014. No desert tortoise individuals, tracks, or scat were noted during these

surveys or during other site visits, including during intensive Pima pineapple cactus and saguaro surveys in the survey area in and surrounding the project area in April and November 2013.

HABITAT EVALUATION AND SUITABILITY

The project area is in the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). Vegetation in the project area includes mesquite, palo verde, and saguaro in the overstory; creosote bush, acacia, and *Lycium* sp. in the midstory; and barrel cactus, desert zinnia, desert marigold, paper flower, globemallow, and grasses in the understory. Soils in the project area are fine to very gravelly sand loams on fan terraces, alluvial fans, swales, or floodplains and have slopes of 0% to 8%. It is possible that individuals of this species could breed, forage, and disperse within the project area because it occurs in the elevational and species' range of the desert tortoise, and the soils and vegetation in the project area may provide habitat for this species. However, there are no reported occurrences of this species within 3 miles of the project area (AZHGIS 2013), and no desert tortoise individuals, tracks, or scat were noted during surveys for this species or during other site visits within the project area.

EFFECTS ANALYSIS

The primary purpose of this BA is to determine the character of the effects, if any, on the species present in the action area. As noted in the USFWS Consultation Handbook (USFWS and National Marine Fisheries Service 1998:xvi), "no effect" determinations are appropriate where the proposed project will not affect a listed species or designated critical habitat. Where species are not present in the action area and no effects are reasonably certain to occur on the species, "no effect" is the appropriate determination for the site. The Consultation Handbook clarifies that a "may affect, not likely to adversely affect" determination is appropriate where effects on listed species are "expected to be discountable, insignificant, or completely beneficial" (USFWS and National Marine Fisheries Service 1998:xv–xvi). The Consultation Handbook further explains that "insignificant effects relate to the size of the impact and should never reach the scale where take occurs" (USFWS and National Marine Fisheries Service 1998:3–12). Conversely, where an effect is not discountable, insignificant, or completely beneficial or anticipated take is likely to occur as a result of the proposed project, the appropriate determination is "may affect, likely to adversely affect" (USFWS and National Marine Fisheries Service 1998:xv–xv).

The standard for determining whether or not an effect should be considered in the effects analysis is whether such effect is "reasonably certain to occur" (see 50 CFR § 402.02, "Interagency Cooperation;" Final Rule, 51 *Federal Register* 19926, 1993–19934 [June 3, 1986]). Only those effects that are reasonably certain to occur are relevant to the effects analysis. That an effect is possible does not meet this standard; it must be shown that such effect is reasonably certain to occur to warrant consideration under ESA Section 7. The effects analysis must address the direct, indirect, interrelated, interdependent, and cumulative effects of an action.

In order to conduct an effects analysis for biological resources, there are many resource impacts to consider, in addition to those within the project area. These include effects of habitat removal, noise, lighting, and air quality that could occur resulting from the proposed project. The temporal analysis period for direct impacts range from long term or permanent for habitat removal, relocated traffic noise, and lighting to short term (i.e., 12 months of construction) for construction noise and air quality impacts. Indirect effects are "those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur," and cumulative effects are "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (USFWS and National Marine Fisheries Service 1998:xiii). Future road maintenance, development, and other various activities in the action area, combined with the expected effects from the proposed project, could cumulatively contribute to impacts such as loss or fragmentation of habitat, noise, air, and light pollution.

The proposed Hughes Access Road Relocation Project would change the project area from undeveloped land to a two-lane roadway and is estimated to permanently impact 106 acres. Of this area, approximately 68 acres will be reseeded with an application of two seed mixes and approximately 17 acres will receive a second application of seed,[7] including the approximately 4 acres where pavement removal of existing roads will occur upon completion of construction of the project. Included in the estimated 106 acres of permanent impacts, up to approximately 5 acres may be used as material management areas. Protected Arizona Native Plants (Section 3-901 to 3-916 and Article 11) are present within the project area and will be impacted by the project; saguaros and Pima pineapple cacti will be transplanted on-site, and other protected plants will be available for salvage. The proposed project would

[7] Second seeding application will occur close to the conclusion of the project in areas that have not been previously seeded and/or in areas where the first seeding application was not successful.

shift current traffic[8] from the existing alignment to the new location. The relocated roadway is not designed to accommodate increased traffic capacity. Thus, traffic volumes are not anticipated to increase on the relocated roadway. Future land development on the TAA land that may increase traffic in the area would be subject to separate environmental review actions.

There are potentially jurisdictional WUS in the project area, and a pre-construction notification of the intent to use a Nationwide Permit 14 (Linear Transportation Projects) of Section 404/401 of the CWA was transmitted to the USACE on April 22, 2014. On June 13, 2014, the USACE issued a Nationwide Permit Verification letter (File Number: SPL-2013-00397-DB) stating that the construction of the proposed project complies with Nationwide Permit 14 to the PCDOT, provided the construction is conducted as described in the permit application (Appendix C). Drainage improvements will be constructed at 17 locations will consist of 15 crossings with reinforced concrete pipe culverts (RCPCs) ranging in size from 24 to 36 inches in diameter and 91 to 302 feet long and two reinforced concrete box culverts (RCBCs) ranging in size from 8 feet by 5 or 6 feet and 95 to 110 feet long (see Appendix D). Several drainage structures will also have drop inlets and rip-rap lined outlets. The project is expected to impact four WUS, and permanent impacts will be attributable to four separate and complete projects/crossings. Total impacts (temporary and permanent) are currently estimated at 0.051 acre, 0.025 acre, 0.027 acre, and 0.029 acre. These culverts have been designed to balance effective drainage and minimal impacts to vegetation and sensitive species within the project area. The need for access to drainages to construct improvements will result in minimal impacts that will be restricted to the ROW or the drainage easements because of the flat topography and the narrow, shallow washes.

The areas in and around these potentially jurisdictional WUS have the potential to support species protected by the ESA. No Pima pineapple cacti were documented as occurring within 50 feet of any potentially jurisdictional WUS. No Sonoran desert tortoises were documented as occurring within the project area; however, they may pass through the project area within potentially jurisdictional WUS. Pima County is proposing species-specific conservation measures for the tortoise (see Sonoran desert tortoise section for details) and has designed culverts for this project that are consistent with the recommendations to improve wildlife connectivity in the AGFD's study of crossing structure designs that facility wildlife movements (AGFD 2011). Specifically, according to the AGFD's recommendations:

- two-lane roadways are more conducive to facilitating wildlife crossing than four-lane roadways (this project will be a two-lane roadway);
- culverts should have a 36-inch minimum diameter pipes or box culverts (this project would include eight RCPC crossings [more than half of the 15 RCPC crossings] with 36-inch-diameters and two RCBCs that are 8 feet by 5 or 6 feet);
- natural vegetation should be maintained around either side of culverts (see discussion in above paragraph);
- drop inlets should have ramp entrances (the steepest drop inlets for the RCBCs are 2% top, 2.5:1 to 3.3:1 ramps, and 5% bottom, and the 15 RCPCs have 2% top, 4:1 ramps, and 2% bottom, all of which are moderate slopes and should be negotiable by tortoises [see Appendix D for culvert locations, typical cross section, plan and profile, and detail graphics for RCPCs and RCBCs]); and
- outlets should not have deadfall zones due to head cutting (for this project, rock rip-rap would be placed on the outlets; tortoises should be able to maneuver on this surface because they are used to rocky slopes, and the grade on the culverts is 0.10 % to 0.30%).

[8] Average daily traffic is currently estimated at 14,622 vehicles per day.

Lesser long-nosed bats may use riparian areas associated with potentially jurisdictional WUS as movement corridors. Fencing will be constructed at 10 culvert locations to protect xeroriparian vegetation associated with potentially jurisdictional WUS to maintain maximum coverage of xeroriparian habitat and reduce impacts to sensitive species such as lesser long-nosed bats that may use potentially jurisdictional WUS. One saguaro, a forage plant for lesser long-nosed bats, was documented as occurring within 50 feet of a potentially jurisdictional WUS. However, this saguaro was too small to flower/fruit and hence provide forage for this bat species.

One or more acres of soil will be disturbed to construct this project; therefore, a CWA Section 402 permit (National Pollutant Discharge Elimination System) will be applied for through the Arizona Department of Environmental Quality's (ADEQ's) General Construction Permit, and a SWPPP will be created and implemented. In order to minimize impacts to threatened and endangered species as well as on the natural hydrologic cycle from the construction of impervious surfaces, such as reductions in infiltration and increases in surface runoff, amplified volumes and velocity of runoff, and increased likelihood of flash floods and erosion, this project has included stormwater planning in its design. The SWPPP will comply with ADEQ's Arizona Pollutant Discharge Elimination System Stormwater Construction General Permit (AZG2013-001) and will implement construction of permanent and temporary stormwater pollution prevention measures, source control, preservation of natural drainage patterns, runoff treatment, flow control, protection to WUS, and details on operations and maintenance of these control measures for associated conveyances.

Species

In addition to the conservation measures incorporated into the project design as identified above, species-specific conservation measures that will benefit listed species are summarized below by species.

Lesser Long-nosed Bat

SPECIES-SPECIFIC CONSERVATION MEASURES

Pima County proposes the following conservation measures to minimize the effects of the proposed project on lesser long-nosed bats:

- Protect in place (including constructing fencing at 11 locations within or along the ROW to minimize or avoid impacts to saguaros), salvage and transplant, or replace all saguaros from the project area to within the adjacent ROW.
    - Salvage or transplant affected saguaros on-site at 1:1 ratio, monitor all transplanted saguaros for 10 years, and if any transplanted saguaros die within the 10-year monitoring period, replace with 4- to 6-foot-tall saguaros at 1:1 ratio.
- Construct temporary fencing at 10 culvert locations where xeroriparian vegetation is associated with potentially jurisdictional WUS to protect and maintain maximum coverage of xeroriparian habitat and reduce impacts to sensitive species such as lesser long-nosed bats.

DIRECT AND INDIRECT EFFECTS

Direct effects are caused by the action and occur at the same time and in the same place as the action. Construction activities for the road relocation are not likely to result in direct effects in the form of mortality or noise impacts to the lesser long-nosed bat in the project area because construction activities are most likely to occur during the day when this species is not likely to be present in the project area. Further, direct effects are not anticipated because roosting habitat (i.e., caves, mine, crevices, etc.) is not

likely to be located within the project area. Direct impacts to lesser long-nosed bats within the action area but outside the project area are also not likely to occur.

Indirect effects are caused by the action and are later in time but are reasonably certain to occur. Indirect effects on the lesser long-nosed bat could occur on their habitat as a result of removing forage plants (i.e., approximately 41 saguaros, of which 14 are mature enough to flower/fruit) from the project area to construct the project. The indirect effects from increased habitat removal, including the removal of wash habitat that provides travel corridors, the addition of lighting, and traffic noise could result in changes in behavior of lesser long-nosed bats in the project area such as habitat use, timing of activity patterns, inter- and intra-specific communication, foraging efficiency and success, reproductive success, and predator-prey relationships (Gordon and Uetz 2012; Grubb and King 1991; Herrera-Montes and Aide 2011; Pater et al. 2009; Slabbekoorn and Ripmeester 2008; USFWS 2012c; Weisenberger et al. 1996).

These direct and indirect effects within the project and action areas are likely to be insignificant (i.e., only 41 saguaros occur within the project area, and there are an additional 213 saguaros in the survey area surrounding the project area) and discountable (roosting habitat is not likely to be located within the project area) for the following reasons: the distance from the proposed project area to the nearest known maternity roost; there are no agaves in the project area; saguaros will be protected in place or salvaged and transplanted and mitigated at a 1:1 ratio (in accordance with the Environmentally Sensitive Roadway Design Guidelines, PCDOT Roadway Design Manual [PCDOT 2013]) (including monitoring of all transplanted saguaros for 10 years, and if any transplanted saguaros die within 10-year monitoring period, replacement with 4- to 6-foot-tall saguaros at 1:1 ratio); temporary fencing (4-feet tall) would be constructed at 10 culvert locations to maintain maximum coverage of xeroriparian habitat and reduce impacts to this species (although there are a total of 17 culvert locations, only 10 culvert locations are called out for protective fencing based on vegetation densities at those locations); new street lighting will only be installed at two locations and will use low-voltage, directional lighting. Thus, the measures to retain only essential lighting on the relocated roadway was made to avoid and minimize any potential effects from roadway lighting; and traffic volumes on the relocated roadway are not anticipated to increase from the volumes on the existing alignment.

INTERRELATED AND INTERDEPENDENT ACTIONS

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. There are no interrelated actions that are expected to affect the lesser long-nosed bat as a result of this project. Interdependent actions are those that have no significant independent utility apart from the action under consideration. An interdependent action of the construction of this project is the maintenance (e.g., weed removal and eradication, and other maintenance activities) of the ROW within the project area. Maintenance of the relocated roadway's ROW is not likely to negatively affect the lesser long-nosed bat because maintenance activities would occur during daytime hours when this species is not likely to be present, and weed removal (e.g., buffelgrass) is likely to benefit lesser long-nosed bat habitat and forage species (i.e., saguaros) in the project area. As previously mentioned, the contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction. Further, to prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site, and to prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site. Additionally, the TUS is scheduled to treat buffelgrass on TUS-operated property, including the areas of the existing and proposed East Hughes Access Roads, in summer 2014 and 2015.[9]

[9] These activities are not included in the proposed project (i.e., Hughes Access Road Relocation Project).

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area. Federal actions that are unrelated to the proposed project are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. Federal lands adjacent to the project area include those owned by the USAF (leased by Raytheon) and TAA-owned lands that are obligated to the FAA. Cumulative effects include changes in land use and development patterns. The proposed project is a roadway relocation project that may alter land uses and development patterns of adjacent properties to aerospace uses by providing better access to these properties and could result in cumulative effects on the lesser long-nosed bat similar to the indirect effects described above. Changes to roadway traffic levels may result should development occur on adjacent properties; however, any future projects to address roadway capacity would require separate environmental review actions. Any development of adjacent properties on TAA land would also be subject to separate environmental evaluations and Section 7 consultation, if required. The relocation of East Hughes Access Road would allow the USAF and Raytheon to continue the current operations at Plant #44 without needing a waiver for proximity to the roadway. Pima County and the TAA are not aware of any additional future developments in the action area.

Pima Pineapple Cactus

SPECIES-SPECIFIC CONSERVATION MEASURES

Pima County proposes the following conservation measures to minimize the effects of the proposed project on Pima pineapple cactus:

- Protect in place as many Pima pineapple cacti and as much habitat as possible during construction, including constructing fencing at locations within or along the ROW to minimize or avoid impacts to individuals. Additional fencing will be installed within the ROW and drainage easements to protect additional Pima pineapple cacti, as needed.

Pima County proposes the following conservation measures to compensate for the effects of the proposed project on Pima pineapple cactus:

- Purchase 70 acres of mitigation credits for Pima pineapple cactus at Pima County's Madera Highlands/Elephant Head properties mitigation bank.[10]
- Salvage and transplant all Pima pineapple cacti that cannot be avoided from the project area to within the adjacent ROW and based on information indicating limited success of transplant efforts on other projects, promote project-specific research into viability of transplanting Pima pineapple cacti.

[10] In March 2006, Pima County Natural Resources, Parks and Recreation completed an agreement with USFWS to establish a new Pima pineapple cacti conservation bank on two properties. These properties are known as Madera Highlands and Elephant Head and total 528.7 acres, of which 494.0 acres were available for future mitigation credits for county-owned projects affecting Pima pineapple cacti. Currently there are over 460 one-acre credits available for use, and although the acre credits are not allocated by location, but rather total credits available for the established bank, the two locations of the two properties are within Pima County. The Madera Highlands site is located 15.5 miles to the south of the unincorporated Three Points area on Highway 286, near milepost 27 at Altar Wash and is approximately 31 miles southwest of the project limits. The Elephant Head site is located 4.5 miles to the east of Interstate 19 near milepost 33 in the unincorporated Canoa Ranch area and is approximately 22 miles south of the project limits.

DIRECT AND INDIRECT EFFECTS

Direct effects are caused by the action and occur at the same time and in the same place as the action. Construction activities for the road relocation could result in direct effects in the form of mortality of individuals because although live Pima pineapple cacti would be transplanted from the project area to within the adjacent ROW prior to construction because transplanted Pima pineapple cacti have low levels of survival. It is estimated that nine Pima pineapple cacti and approximately 70 acres of Pima pineapple cactus habitat would be directly affected. To minimize direct effects of the proposed project on Pima pineapple cactus, Pima County would protect as many Pima pineapple cacti and as much habitat as possible during construction and would salvage and transplant all Pima pineapple cacti that cannot be avoided in the project area to within the adjacent ROW.

Indirect effects are caused by the action and are later in time but are reasonably certain to occur. As previously stated, although individual Pima pineapple cactus would be transplanted on-site, transplantation of this species is not always successful, so some individuals may perish following transplantation. Further, areas of permanent disturbance would remove portions of the seed bank; areas of temporary disturbance could alter the seed bank; and disturbance of soils would change water infiltration, compact soil, and change local site conditions. Although some areas of temporary disturbance could recover, it may take many years before full recovery is achieved. Recently disturbed areas have an increased potential to be invaded by noxious weeds (e.g., buffelgrass), which can negatively affect Pima pineapple cactus. Finally, any individuals growing in the project area adjacent to the roadway corridor during construction could experience impacts from fugitive dust.

To minimize indirect effects of the proposed project on Pima pineapple cactus, the contractor will seed all disturbed soils that will not be landscaped or otherwise permanently stabilized by construction with species native to the project vicinity, implement measures to prevent the introduction of invasive plant species, and identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction.

INTERRELATED AND INTERDEPENDENT ACTIONS

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. There are no interrelated actions that are expected to affect the Pima pineapple cactus as a result of this project. Interdependent actions are those that have no significant independent utility apart from the action under consideration. An interdependent action of the construction of this project is the maintenance (e.g., weed removal and eradication, and other maintenance activities) of the ROW within the project area. Maintenance of the relocated roadway's ROW is not likely to negatively affect Pima pineapple cacti because weed removal (e.g., buffelgrass) is likely to benefit Pima pineapple cacti in the project area. As previously mentioned, the contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction. Further, to prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site, and to prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site. Additionally, the TUS is scheduled to treat buffelgrass on TUS-operated property, including the areas of the existing and proposed East Hughes Access Roads, in summer 2014 and 2015.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area. Federal actions that are unrelated to the proposed action are not

considered in this section because they require separate consultation pursuant to Section 7 of the ESA. Federal lands adjacent to the project area include those owned by the USAF (lease by Raytheon) and TAA-owned lands that are obligated to the FAA; therefore, activities on these lands could affect Pima pineapple cactus but would be subject to separate Section 7 consultation under the ESA and are not addressed in this BA. Cumulative effects include changes in land use and development patterns.
The proposed project is a roadway relocation project that may alter land uses and development patterns of adjacent properties to aerospace uses by providing better access to these properties and could result in cumulative effects on the Pima pineapple cactus and its habitat similar to the direct and indirect effects described above. Changes to roadway traffic levels may result should development occur on adjacent properties; however, any future projects to address roadway capacity would require separate environmental review actions. Any development of adjacent properties on TAA land would also be subject to separate environmental evaluations and Section 7 consultation, if required. The relocation of East Hughes Access Road would allow the USAF and Raytheon to continue the current operations at Plant #44 without needing a waiver for proximity to the roadway. Pima County and the TAA are not aware of any additional future developments in the action area.

Sonoran Desert Tortoise

SPECIES-SPECIFIC CONSERVATION MEASURES

Pima County proposes the following conservation measures to minimize the effects of the proposed project on Sonoran desert tortoises (also see page 21 of Effects Analysis section for a description of culvert designs for this project that are consistent with the AGFD's recommendations to improve wildlife, including tortoise, connectivity [AGFD 2011]):

- Prior to the start of construction activities, Pima County shall provide awareness training session to the on-site construction personnel regarding Sonoran desert tortoise.
- The contractor shall cover trenches, or place escape ramps, at the end of the work day. The contractor shall inspect trenches at beginning of every work day to ensure that no tortoises, or other wildlife, are trapped within trenches. In the event that wildlife becomes injured or trapped (and cannot be freed), AGFD will be contacted.
- If any Sonoran desert tortoises are encountered during construction, the contractor shall contact Pima County environmental staff and adhere to the attached AGFD's Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Revised October 23, 2007) (see Appendix H).
- If any Sonoran desert tortoises are encountered during construction, Pima County shall provide a qualified biological monitor on-site during construction activities to ensure that activities stay within the designated project area, to evaluate the response of individual tortoises that come near the project area, and to ensure implementation of the AGFD's Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects (Revised October 23, 2007) (Appendix H).

DIRECT AND INDIRECT EFFECTS

Direct effects are those that are caused by the action and occur at the same time and in the same place as the action. No direct effects on Sonoran desert tortoises are anticipated due the proposed action, since there have been no reported occurrences of the species within 3-miles of the project area, and no individuals, tracks, or scat were noted in surveys for this species or during other site visits within the project area. Construction activities related to the road relocation could result in direct impacts to this species, which could result in injury or death to individual tortoises. However, the conservation measures above are meant to prevent direct effects on individuals. Additionally, construction noise associated with

construction activities could directly impact tortoises in the project area. The impacts of noise on tortoises in the project area could range from habitat use changes, activity pattern changes, changing time of day when communicating, increased stress responses, decreased immune responses, decreased foraging efficiency and success, reduced reproductive success, changes in predator-prey relationships, diminished intraspecific communication, and hearing damage (Gordon and Uetz 2012; Grubb and King 1991; Herrera-Montes and Aide 2011; Pater et al. 2009; Slabbekoorn and Ripmeester 2008; USFWS 2012c; Weisenberger et al. 1996). These responses can vary, depending on the nature of the sound, including sound level, rate of onset, duration, number of events, spectral distribution of sound energy, and level of background noise.

Indirect effects are those that are caused by the proposed action and are later in time but are still reasonably certain to occur. Any individuals present in the project area could experience indirect impacts after the completion of the construction activities because of increased traffic noise on the relocated roadway or the relocated traffic itself, which could result in injury or mortality of individuals or long-term impacts to populations living or passing through the project area. The removal of habitat, and subsequent construction of roads and power lines or light poles, creates habitat for ravens *(Corvus* spp.), which are known predators of Mojave desert tortoises and possibly Sonoran desert tortoises (USFWS 2010b). Further, the roadway corridor, an unvegetated strip, may act as a barrier to movement of individual tortoises. However, the culverts that are designed for the proposed project should accommodate movements of tortoises under the new roadway because they will be of adequate diameter, natural vegetation will be maintained around the culverts, and the slopes and composition of the inlets and outlets are gradual and suitable for tortoises, respectively (see "Effects Analysis" section above and Appendix D for more details).

Other known indirect effects of roads on tortoises include threats of increased litter associated with increased traffic. Little is known about the effects of garbage and litter on the desert tortoise; however, balloons (Walde et al. 2007), a widespread type of litter, and other plastics, metal foil, and glass, if ingested, are potential threats to the desert tortoise because they can give a false sense of fullness, causing starvation (USFWS 1998). Additionally, garbage such as string or rubber bands can become entangled around tortoises' heads or legs, causing infections, loss of limbs, or strangulation. Fires in the desert are increasing in frequency owing to the invasion of non-native grasses (e.g., buffelgrass) and forbs, which provide levels of fuels that are not typically found in the desert (AIDTT 2000).
The relocation of East Hughes Access Road could increase the amount of disturbance in the area and promote the spread of non-native plant species that provide fuels for fire, and fires affect desert tortoises by killing them with lethal heat or low oxygen levels and may indirectly alter their habitat. However, as mentioned above, conservation measures to curb the introduction and spread of buffelgrass, and other invasive plant species, in the project area are proposed.

The aforementioned indirect effects from habitat alteration, relocated traffic and associated noise, litter, non-native plant species, and fires could result in changes in behavior of tortoises in the project area such as habitat use, timing of activity patterns, inter- and intra-specific communication, foraging efficiency and success, reproductive success, and predator-prey relationships. However, given that during species-specific surveys and intensive surveys for Pima pineapple cactus and saguaros no tortoises were detected, given that traffic volumes on the relocated roadway are not anticipated to increase from the volumes on the existing alignment, and given the proposed conservation measures, these impacts are likely to be insignificant and discountable.

INTERRELATED AND INTERDEPENDENT ACTIONS

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. There are no interrelated actions that are expected to affect the Sonoran desert tortoise as a

result of this project. Interdependent actions are those that have no significant independent utility apart from the action under consideration. An interdependent action of the construction of this project is the maintenance (e.g., weed removal and eradication, and other maintenance activities) of the ROW within the project area. Maintenance of the relocated roadway's ROW is not likely to negatively affect the Sonoran desert tortoise because weed removal (e.g., buffelgrass) is likely to benefit Sonoran desert tortoise and their forage plants in the project area. As previously mentioned, the contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction. Further, to prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site, and to prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site. Additionally, the TUS is scheduled to treat buffelgrass on TUS-operated property, including the areas of the existing and proposed East Hughes Access Roads, in summer 2014 and 2015.

CUMULATIVE EFFECTS

Cumulative effects are effects of future state, tribal, local, or private activities that are reasonably certain to occur within the action area. Federal actions that are unrelated to the proposed project are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. Federal lands adjacent to the project area include those owned by the USAF (lease by Raytheon) and TAA-owned lands that are obligated to the FAA; therefore, activities on these lands could affect Sonoran desert tortoise but would be subject to separate Section 7 consultation under the ESA and are not addressed in this BA. Cumulative effects include changes in land use and development patterns.
The proposed project is a roadway relocation project that may alter land uses and development patterns of adjacent properties to aerospace uses by providing better access to these properties and could result in cumulative effects on the Sonoran desert tortoise similar to the direct and indirect effects described above. Changes to roadway traffic levels may occur should development occur on adjacent properties; however, any future projects to address roadway capacity would require separate environmental review actions. Any development of adjacent properties on TAA land would also be subject to separate environmental evaluations and Section 7 consultation, if required. The relocation of East Hughes Access Road would allow the USAF and Raytheon to continue the current operations at Plant #44 without needing a waiver for proximity to the roadway. Pima County and the TAA are not aware of any additional future developments in the action area.

CONCLUSIONS

The assessment of potential impacts to federally listed species contained in this BA by the proposed project indicates the project may affect but is not likely to adversely affect the lesser long-nosed bat and may affect and is likely to adversely affect the Pima pineapple cactus. The proposed project may impact individual Sonoran desert tortoise. However, the impacts are such that they are not likely to result in trend toward listing or loss of viability. These conclusions are based on the proposed action activities, as well as the conservation measures incorporated into the project design and species-specific conservation measures proposed to avoid, minimize, and compensate the effects on the listed species.

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Walde, A.D., M.L. Harless, D.K. Delaney, and L.L. Pater. 2007. Anthropogenic threat to the desert tortoise (*Gopherus agassizii*): Litter in the Mojave Desert. *Western North American Naturalist* 67(1):147–149.

Weisenberger, M.E., P.R. Krausman, M.C. Wallace, D.W. De Young, and O.E. Maughan. 1996. Effects of simulated jet aircraft noise on heart rate and behavior of desert ungulates. *The Journal of Wildlife Management* 60(1):52–61.

WestLand Resources, Inc. 2004. *A Preliminary Population Estimate of Pima Pineapple Cactus* (Coryphantha robustispina) *in South-Central Arizona (Pima and Santa Cruz Counties)*. Tucson.

———. 2009. *Lesser Long-nosed Bat Survey of the Rosemont Holdings and Vicinity*. Project No. 1049.10 330 330A. Prepared for Rosemont Copper Company. March 11.

Wilkinson, G.S., and T.H. Fleming. 1996. Migration and evolution of lesser long-nosed bats *Leptonycteris curasoae*, inferred from mitochondrial DNA. *Molecular Ecology* 5:329–339.

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APPENDIX A

U.S. Fish and Wildlife Service Endangered Species List for Pima County

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

Arizona Ecological Services Field Office
2321 WEST ROYAL PALM ROAD, SUITE 103
PHOENIX, AZ 85021
(602) 242-0210
http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Project Name:

Hughes

Project Counties:

Pima, AZ

Project Type:

Transportation

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of **24** threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Amphibians	Status		Has Critical Habitat	Contact

U.S. Fish and Wildlife Service

Natural Resources of Concern

Chiricahua leopard frog (*Lithobates chiricahuensis*) Population: Entire	Threatened	species info	Final designated critical habitat Final designated critical habitat	Arizona Ecological Services Field Office
Birds				
California Least tern (*Sterna antillarum browni*)	Endangered	species info		Arizona Ecological Services Field Office
Masked bobwhite (*Colinus virginianus ridgwayi*) Population: Entire	Endangered	species info		Arizona Ecological Services Field Office
Mexican Spotted owl (*Strix occidentalis lucida*) Population: Entire	Threatened	species info	Final designated critical habitat	Arizona Ecological Services Field Office
Southwestern Willow flycatcher (*Empidonax traillii extimus*) Population: Entire	Endangered	species info	Final designated critical habitat	Arizona Ecological Services Field Office
Yellow-Billed Cuckoo (*Coccyzus americanus*) Population: Western U.S. DPS	Proposed Threatened	species info		Arizona Ecological Services Field Office
Fishes				

U.S. Fish and Wildlife Service

Natural Resources of Concern

Desert pupfish (*Cyprinodon macularius*) Population: Entire	Endangered	species info	Final designated critical habitat Final designated critical habitat	Arizona Ecological Services Field Office
Gila chub (*Gila intermedia*) Population: Entire	Endangered	species info	Proposed critical habitat (map unavailable) Final designated critical habitat	Arizona Ecological Services Field Office
Gila topminnow (*Poeciliopsis occidentalis*) Population: U.S.A. only	Endangered	species info		Arizona Ecological Services Field Office
Sonora chub (*Gila ditaenia*) Population: Entire	Threatened	species info	Final designated critical habitat Final designated critical habitat	Arizona Ecological Services Field Office
Flowering Plants				
Acuna Cactus (*Echinomastus erectocentrus var. acunensis*)	Endangered	species info		Arizona Ecological Services Field Office
Canelo Hills ladies'-tresses (*Spiranthes delitescens*)	Endangered	species info		Arizona Ecological Services Field Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

Huachuca water-umbel (*Lilaeopsis schaffneriana var. recurva*)	Endangered	species info	Final designated critical habitat	Arizona Ecological Services Field Office
Kearney's blue-star (*Amsonia kearneyana*)	Endangered	species info		Arizona Ecological Services Field Office
Nichol's Turk's Head cactus (*Echinocactus horizonthalonius var. nicholii*)	Endangered	species info		Arizona Ecological Services Field Office
Pima Pineapple cactus (*Coryphantha scheeri var. robustispina*)	Endangered	species info		Arizona Ecological Services Field Office
Mammals				
jaguar (*Panthera onca*) Population: U.S.A (AZ,CA,LA,NM,TX),Mexico,Central and South America	Endangered	species info		Arizona Ecological Services Field Office
Lesser Long-Nosed bat (*Leptonycteris curasoae yerbabuenae*) Population: Entire	Endangered	species info		Arizona Ecological Services Field Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

ocelot (*Leopardus (=felis) pardalis*) Population: U.S.A.(AZ, TX) to Central and South America	Endangered	species info		Arizona Ecological Services Field Office
Sonoran pronghorn (*Antilocapra americana sonoriensis*) Population: Entire	Endangered	species info		Arizona Ecological Services Field Office
Reptiles				
Northern Mexican gartersnake (*Thamnophis eques megalops*)	Proposed Threatened	species info		Arizona Ecological Services Field Office
Sonoran desert tortoise (*Gopherus morafkai*) Population:	Candidate	species info		Arizona Ecological Services Field Office
Sonoyta Mud turtle (*Kinosternon sonoriense longifemorale*) Population:	Candidate	species info		Arizona Ecological Services Field Office
Tucson Shovel-Nosed Snake (*Chionactis occipitalis klauberi*)	Candidate	species info		Arizona Ecological Services Field Office

Critical habitats within your project area: (View all critical habitats within your project area on one map)

The following critical habitats lie fully or partially within your project area.

U.S. Fish and Wildlife Service

Natural Resources of Concern

Amphibians	Critical Habitat Type
Chiricahua leopard frog (*Lithobates chiricahuensis*) Population: Entire	Final designated critical habitat Final designated critical habitat
Birds	
Mexican Spotted owl (*Strix occidentalis lucida*) Population: Entire	Final designated critical habitat
Southwestern Willow flycatcher (*Empidonax traillii extimus*) Population: Entire	Final designated critical habitat
Fishes	
Desert pupfish (*Cyprinodon macularius*) Population: Entire	Final designated critical habitat
Gila chub (*Gila intermedia*) Population: Entire	Final designated critical habitat

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are **2** refuges in your refuge list

Cabeza Prieta National Wildlife Refuge (520) 387-6483 1611 NORTH SECOND AVENUE AJO, AZ85321	refuge profile
Buenos Aires National Wildlife Refuge (520) 823-4251 P.O. BOX 109 SASABE, AZ85633	refuge profile

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

U.S. Fish and Wildlife Service

Natural Resources of Concern

Migratory bird information is not available for your project location.

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.

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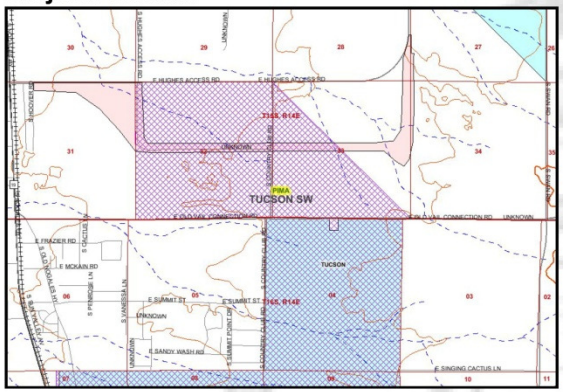
APPENDIX B

Arizona Game and Fish Department's Heritage Data Management System On-line Environmental Review Tool

Arizona's On-line Environmental Review Tool
Search ID: 20131106021789
Project Name: Hughes Rd updated
Date: 11/6/2013 10:16:20 AM

Project Location



Project Name: Hughes Rd updated
Submitted By: Angela Barclay
On behalf of: PIMA
Project Search ID: 20131106021789
Date: 11/6/2013 10:16:16 AM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 506430.654, 3550005.682 meter
Project Area: 231.134 acres
Project Perimeter: 12655.225 meter
County: PIMA
USGS 7.5 Minute Quadrangle ID: 1805
Quadrangle Name: TUCSON SW
Project locality is not anticipated to change

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	LE			HS
San Xavier Indian Reservation	San Xavier Indian Reservation				

 APPLICATION INITIALS: _____

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: http://arizonaes.fws.gov/.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads

Project Type Recommendations:

All degraded and disturbed lands should be restored to their natural state. Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required http://azstateparks.com/SHPO/index.html

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (http://www.spl.usace.army.mil/regulatory/phonedir.html)

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants http://www.azda.gov/PSD/quarantine5.htm. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: http://www.usda.gov/wps/portal/usdahome. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important

wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Hydrological considerations: design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Aquatic wildlife considerations: reduce/minimize barriers to migration of amphibians or fish (e.g. eliminate falls). Terrestrial wildlife: washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise, while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Guidelines for culvert designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Planning: consider impacts of lighting intensity on mammals and birds and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use.

Preconstruction - Consider design structures and construction plans that minimize impacts to channel geometry (i.e. width/depth ratio, sinuosity, allow overflow channels) to avoid alteration of hydrological function. Identify whether wildlife species use the structure for roosting or nesting during anticipated construction period. Plan the timing of construction/maintenance to minimize impacts to wildlife species. In addition to the species list generated by the Arizona's On-line Environmental Review Tool, the Department recommends that surveys be conducted at the bridge and in the vicinity of the bridge to identify additional or currently undocumented bat, bird, or aquatic species in the project area. To minimize impacts to birds and bats, as well as aquatic species, consider conducting maintenance and construction activities outside the breeding/maternity season (breeding seasons for birds and bats usually occur spring - summer). Examining the crevices for the presence of bats prior to pouring new paving materials. When bats are present, the top of the crevices should be sealed to prevent material from dripping or falling through the cracks and potentially onto bats. If bats are present, maintenance and construction (including paving and milling) activities should be conducted during nighttime hours, if possible, when the fewest number of bats will be roosting. Consider incorporating roosting habitat for bats into bridge designs. Minimize impacts to the vegetation community. A revegetation plan should be developed to replace impacted communities. Unavoidable impacts to vegetation should be mitigated on-site whenever possible. During construction: Erosion control structures and drainage features should be used to prevent introduction of sediment laden runoff into the waterway. Minimize instream construction activity. If culverts are planned, mitigate impacts to wildlife and fish movement. Guidelines for bridge designs to facilitate wildlife passage can be found at http://www.azgfd.gov/hgis/guidelines.aspx.

Recommendations will be dependant upon goals of the fence project and the wildlife species expected to be impacted by the project. General guidelines for ensuring wildlife-friendly fences include: barbless wire on the top and bottom with the maximum fence height 42", minimum height for bottom 16". Modifications to this design may be considered for fencing anticipated to be routinely encountered by elk, bighorn sheep or pronghorn (e.g., Pronghorn fencing would require 18" minimum height on the bottom). Please refer to the Department's Fencing Guidelines located at http://www.azgfd.gov/hgis/guidelines.aspx.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly.

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches.

Project Location and/or Species recommendations:

Tribal Lands are within the vicinity of your project area (refer to page 1 of the receipt) and may require further coordination. Please contact:
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634
Phone: 520-383-2028
Fax: 520-383-3379

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:
Ecological Services Office
US Fish and Wildlife Service
2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s)**

 APPLICATION INITIALS: _____

are to be accomplished, and project locality information (including site map).
7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366

Terms of Use

By using this site, you acknowledge that you have read and understand the terms of use. Department staff may revise these terms periodically. If you continue to use our website after we post changes to these terms, it will mean that you accept such changes. If at any time you do not wish to accept the Terms, you may choose not to use the website.

1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

 APPLICATION INITIALS: _____

Signature:_____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____

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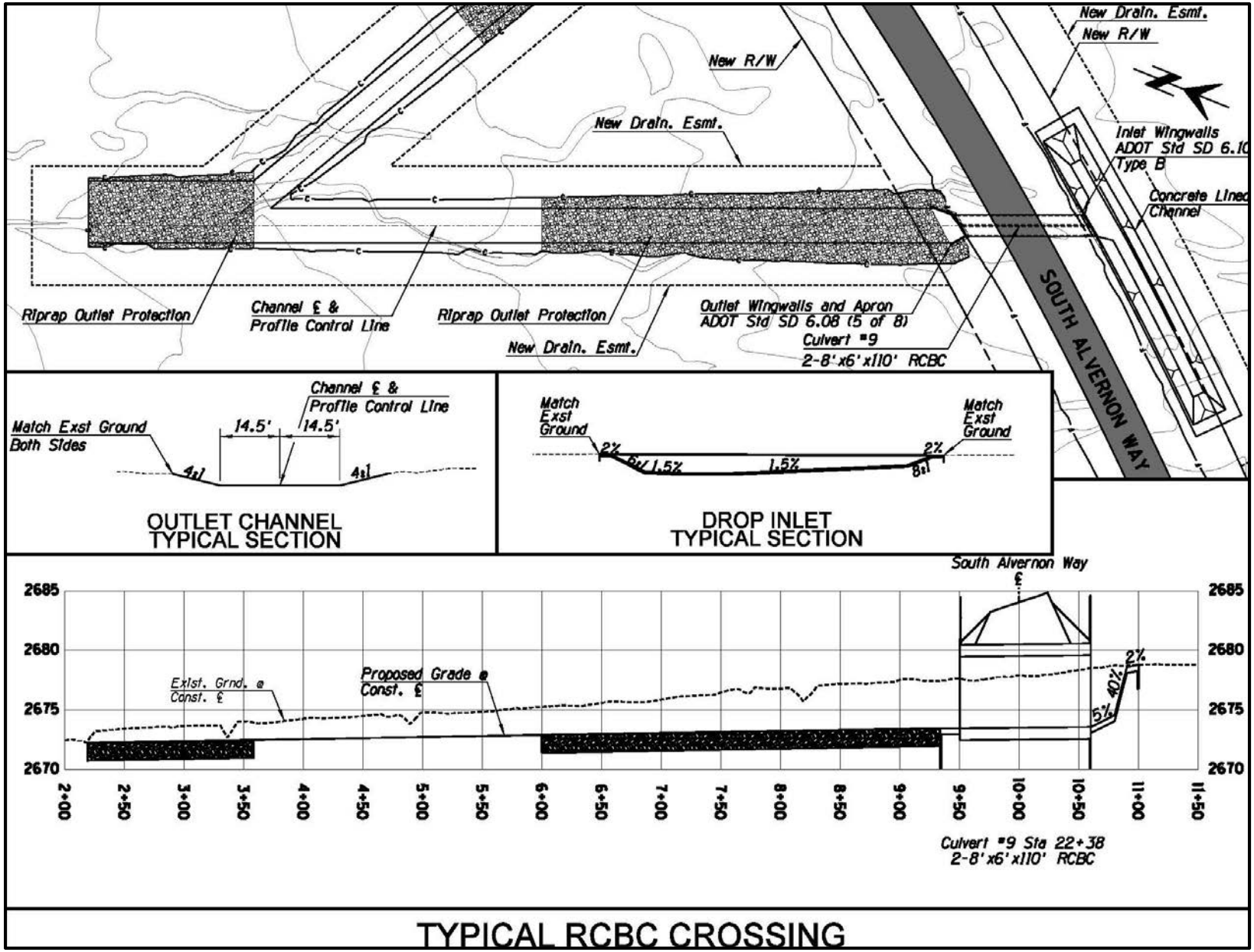
APPENDIX C

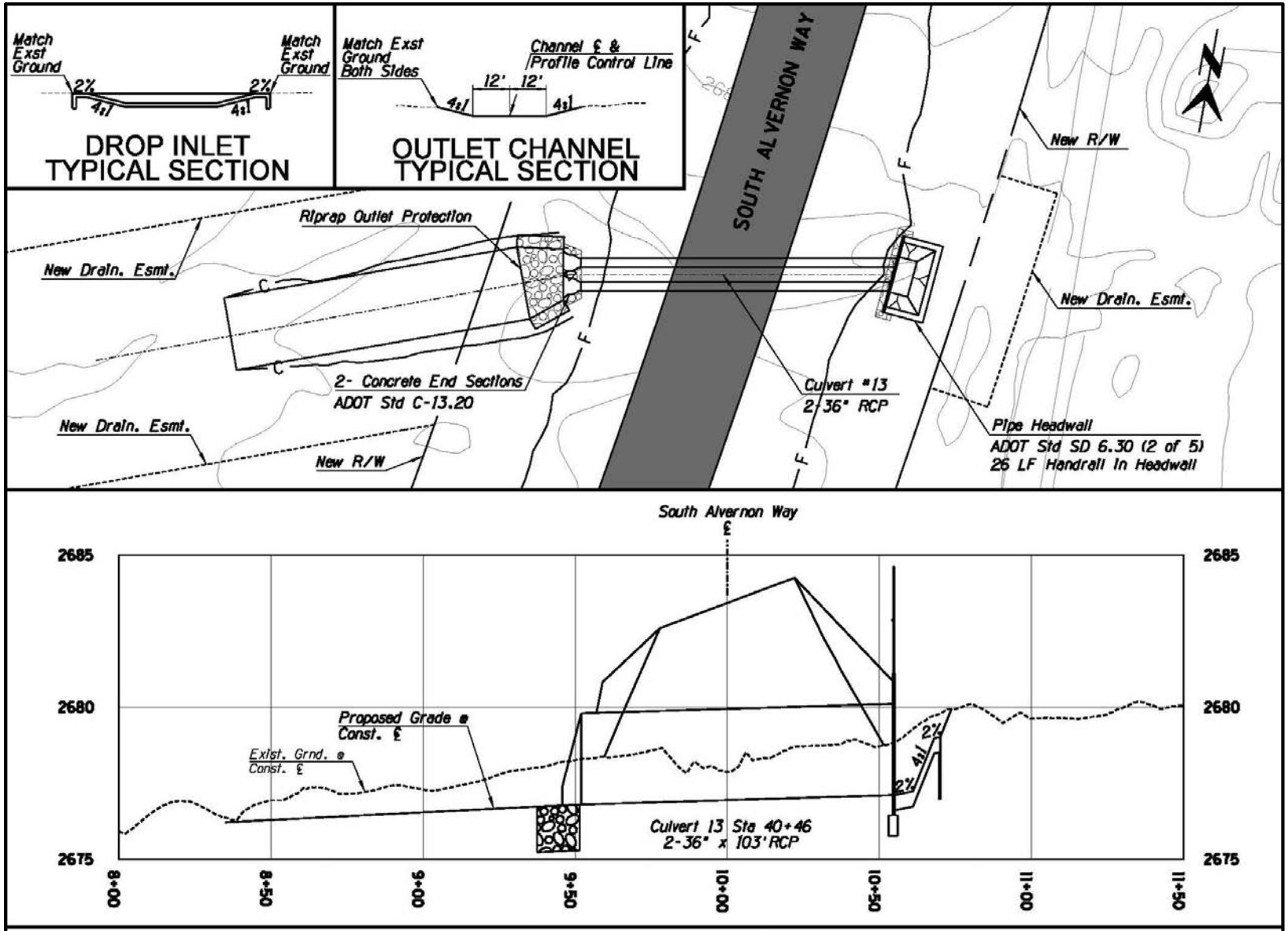
Department of the Army Nationwide Permit Verification Letter
File Number: SPL-2013-00397-DB

APPENDIX D

Drainage Improvement Locations, Typical Cross Section, Plan and Profile, and Detail Graphics for Culverts



TYPICAL RCBC CROSSING



TYPICAL RCP CROSSING

E. HUGHES ACCESS ROAD
DRAINAGE STRUCTURES
Legend
Proposed Roadway
Riprap Channel
Drainage Features
Jurisdictional Delineation
N
1"=1000'
S. Nogales Highway
S. Access Rd.
S. Alvernon Way
UPRR
S. Country Club Rd.
Existing E. Hughes Access Rd.
Proposed Hughes Access Rd.
Culvert #1
1-36" RCP
Culvert #2
4-24" RCP
Culvert #3
3-36" RCP
Culvert #4
2-24" RCP
Culvert #5
2-24" RCP
Culvert #6
1-24" RCP
Culvert #7
1-24" RCP
Culvert #8
2-30" RCP
Culvert #9
2-8'x6' RCBC
Culvert #10
2-8'x5' RCBC
Culvert #11
3-36" RCP
Culvert #12
6-36" RCP
Culvert #13
2-36" RCP
Culvert #14
2-36" RCP
Culvert #15
1-24" RCP
Culvert #22
6-36" RCP
Culvert #23
4-36" RCP

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APPENDIX E

U.S. Fish and Wildlife Service's Technical Assistance Letter

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
02EAAZ00-2014-TA-0077

January 16, 2014

Ms. Karla Reeve-Wise
Pima County Department of Transportation
201 North Stone Avenue, Fourth Floor
Tucson, Arizona 85701-1207

Dear Ms. Reeve-Wise:

Thank you for your November 27, 2013 request for technical assistance related to the proposed relocation of the Hughes access road between South Old Nogales Highway and South Alvernon Way in Pima County, Arizona. This project is within the range of the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) and Pima pineapple cactus (*Coryphanthat scheeri* var. *robustispina*), two species listed as endangered under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.)(Act). Additionally, as you have indicated in your correspondence, the project area also supports the Sonoran desert tortoise (*Gopherus agassizii*), a candidate species under the Act.

We have reviewed the information related to the proposed action and the potential effects to the lesser long-nosed bat, Pima pineapple cactus, and the Sonoran desert tortoise as contained in the November 2013 draft Biological Evaluation (BE) included in your November 27, 2013 correspondence. This letter documents our response to your request for technical assistance regarding the potential effects to endangered species associated with the proposed project.

In general, the draft BE includes a very brief description of the proposed action so that it is difficult to fully evaluate effects to each species. Specifically, the proposed action does not include a description of construction access points, detours, details of the stormwater pollution prevention plan, need for and subsequent design of wash crossings, and quantification of current traffic volumes on Hughes Access Road. Also, during our meeting on August 21, 2013, Pima County stated that an additional 50 acres at the west end of the proposed project area needed to be surveyed for both Pima pineapple cactus and saguaro cactus (*Carnegiea gigantea*). It is not evident in the draft BE if this was accomplished. In addition, there also appears to be some confusion on application of the following terms in the draft BE: interrelated action, interdependent action, and cumulative effects. The draft BE states that Tucson Airport Authority's future airfield development is an interrelated action, but it is in fact a future action with a cumulative effect. Maintenance of the right-of-way (ROW) within this project limits is correctly included as an interdependent action, but associated effects of this maintenance are not analyzed as part of the action in the draft BE. Finally, the draft BE states that there may be effects from interrelated or interdependent actions, as well as cumulative effects, but the draft BE does not describe or analyze such effects.

Lesser Long-nosed Bat

As indicated in the draft BE, no lesser long-nosed bat roosting habitat (caves, mines, crevices, etc.) is found within the project boundaries. Therefore, no direct effects to roosting lesser long-nosed bats are anticipated. However, lesser long-nosed bats have the potential to forage in this area due to the proximity of the project area to a a number of post-maternity roosts in the Catalina and Rincon Mountains. Saguaros are an important forage species for the lesser long-nosed bat. The Tucson area has historically supported a lesser long-nosed bat maternity roost, but we currently do not know the status of this roost site. However, recent research continues to document the use of the Tucson area by foraging lesser long-nosed bats, although the timing of the use by these bats is variable and may be later than use by bats at a maternity roost. However, we believe foraging lesser long-nosed bats in the Tucson area potentially use saguaros as a forage resource from May through July. The draft BE states that there are 41 saguaros within the right-of-way of the proposed new Hughes Access Road that will likely be impacted by construction activities. Of these 41 saguaros, 14 are $\geq$ 8 feet tall and thus likely to be of flowering age. The draft BE includes a conservation measure to protect in place, salvage and transplant, or replace all saguaros from within the project limits to within the adjacent project area. We fully support the preservation on-site of all saguaros within the project area. If affected saguaros must be salvaged and transplanted, we also support the proposed conservation measure to salvage and transplant all impacted saguaros on-site. In addition, we recommend monitoring of all transplanted saguaros for a period of 10 years; if any of these saguaros are found to be dying during the 10-year period, we recommend additional 1:1 replacement with 4- to 6-foot saguaros. If monitoring cannot take place, then we recommend a conservation measure to replace all saguaros impacted by construction on-site with 4- to 6-foot saguaros at a 3:1 ratio.

The draft BE states that there are three separate jurisdictional waters of the U.S. that the proposed new road will cross, and that there are an additional 213 saguaros within the project limits (71 $\geq$ 8 feet tall) on either side of the new road. Habitat connectivity among foraging areas and between roost sites and foraging areas is important for the conservation of lesser long-nosed bats. Recent telemetry research conducted by the Arizona Game and Fish Department (AGFD) on foraging lesser long-nosed bats in the Tucson Basin shows that foraging bats travel along washes as they move between foraging areas and roost locations. The AGFD believes that the washes provide areas of reduced lighting that provide pathways for movement while reducing the likelihood of predation and other threats (AGFD 2009). It is, therefore, important to maintain adequate movement corridors for lesser long-nosed bats in order for them to take advantage of available forage resources. We recommend that every effort be made to maintain the maximum coverage of wash habitat within the project area to provide habitat connectivity for lesser long-nosed bats. This measure will also conserve habitat connectivity and permeability for a range of other wildlife in the project area.

Lighting also appears to influence the areas selected by lesser long-nosed bats for movement and foraging. Recent studies have shown that artificial lights affect the movements of bats through the landscape, particularly slower flying bats. Stone et al. (2009) and Rydell (1992) showed in separate studies that street lighting disturbed and even prevented movements by certain species of bats; primarily bats with slower flight behavior. Lesser long-nosed bats use a hovering, slow flight while foraging and, as AGFD (2009) suggests, may be avoiding areas with artificial lighting. Except for mention of a new traffic signal at the new intersection of East Hughes Access Road and South Hughes Access Road, the draft BE does not indicate that there is street lighting associated with this project. We believe that any lighting associated with the proposed

project could have the potential to reduce habitat connectivity for the lesser long-nosed bat within the project area and may interfere with the bat's ability to use available forage within the project. We do not, however, have information to definitively evaluate this potential effect. If there is street lighting associated with this project, we urge Pima County to consider the effects of any lighting and the additional development associated with the proposed project on lesser long-nosed bat movements and foraging. We recommend that low voltage, directional lighting be considered to reduce light pollution.

Finally, the draft BE concludes that the fact that traffic volumes on the relocated roadway are not anticipated to increase from the volumes on the existing alignment makes any associated indirect effects insignificant. We do not agree with this conclusion as stated. Although the traffic volumes may not be increasing, the traffic itself is a new location so these are new effects and must be evaluated as such.

Pima Pineapple Cactus

The draft BE states 7 individual endangered Pima pineapple cacti and approximately 65 acres of habitat for the species within the right-of-way of the proposed new Hughes Access Road would be adversely affected by the proposed action. The draft BE also states that construction activities for the road relocation are not likely to result in direct effects in the form of mortality of individuals because live Pima pineapple cacti would be transplanted from within the project limits to the adjacent right of way prior to construction. We disagree with this statement because salvage of Pima pineapple cactus has shown very limited success with transplanted individuals experiencing high first-year mortality. Even if Pima pineapple cacti are salvaged from a site, transplanted individuals are not considered as functioning within the context of a self-sustaining population. Transplanted Pima pineapple cactus have low levels of survival, and past efforts to transplant individual Pima pineapple cactus to other locations have had only limited success. For example, on two separate projects in Green Valley, the mortality rate for transplanted Pima pineapple cactus after two years was 24% and 66%, respectively (SWCA, Inc. 2001, WestLand Resources, Inc. 2004). One project southwest of Corona de Tucson involved transplanting Pima pineapple cactus into areas containing *in situ* plants. Over the course of three years, 48% of the transplanted individuals and 24% of the *in situ* individuals died (WestLand Resources, Inc. 2008). As a result, transplanted Pima pineapple cacti are not likely to contribute significantly to the overall population. There is also the unquantifiable loss of the existing Pima pineapple cactus seed bank associated with the loss of suitable habitat. Furthermore, once individuals are transplanted from a site, Pima pineapple cactus is considered to be extirpated, as those individuals functioning in that habitat are irretrievably lost. In addition, the complete removal of vegetation and disturbance of soils will change water infiltration, compact soil, and change local site conditions.

We recommend that the Pima County avoid as many of these cacti and habitat as possible during construction activities. We support the conservation measure in the draft BE to offset unavoidable impacts to individual Pima pineapple cacti or habitat through acquiring credits in an approved mitigation bank. We do not support salvage and transplant of individual Pima pineapple cactus in and of itself as a conservation measure. Instead, we recommend that Pima County encourage project-specific research into the viability of transplanting Pima pineapple cactus as a conservation measure. While we currently lack adequate information to authorize the

use of transplantation as a best management practice, we welcome such a study because it will provide us with scientific information on which to base best management practices for this species. Developing an appropriate transplanting protocol for Pima pineapple cactus would allow for this species to remain in the landscape and maintain ecosystem function on lands administered by Pima County. We also support the mitigation measures to protect other native plants and prevent invasive species invasion as outlined in section 6 of the draft BE. We recommend that Pima County include invasive species monitoring and abatement as part of post-construction maintenance of the new road ROW, as well as monitoring the old road ROW that will be abandoned.

Sonoran Desert Tortoise

The Sonoran desert tortoise is currently a candidate species under the ESA. As such, this species does not currently fall under the protective regulations of the ESA. However, this species is included in a list of candidate species that must move forward within the listing process as part of a large, court-ordered settlement. A determination on the listing of the Sonoran desert tortoise is scheduled to be initiated in 2014, with a potential publication date in 2015. We are supportive of the inclusion of the Sonoran desert tortoise in the draft BE, including best management practices and conservation measures which will address potential impacts of the proposed project on the tortoise, as well as contribute to the conservation of this species.

The draft BE indicates that the project area may provide habitat for the Sonoran desert tortoise, but that no tortoise surveys were conducted in the project area and that no tortoises were found in the project area during surveys to locate Pima Pineapple Cactus and saguaro. Timing of saguaro surveys is not mentioned in the draft BE and Pima Pineapple Cactus surveys were conducted in April 2013 when the tortoise may not be active. Therefore, these surveys may not be adequate to determine species presence in the project area. The proposed action is scheduled to take place during the time of year when desert tortoises are likely to be active. We fully support the conservation measure in the draft BE requiring the construction contractor to adhere to "AGFD guidelines for handling Sonoran desert tortoises encountered on development projects". We also recommend that Pima County consider providing a qualified biological monitor on site during the work activities for this project that take place in habitat for the Sonoran desert tortoise. Duties of the biological monitor would include ensuring that activities stay within designated project areas, evaluating the response of individual tortoises that come near the project site, and implementing the AGFD guidelines for handling tortoises. In addition, open trenches associated with project construction may trap, injure, or kill Sonoran desert tortoises and other wildlife if they fall into these trenches. We recommend that trenches be covered at the end of the work day, or that escape ramps be placed in the trenches. Trenches should be inspected at the beginning of every work day to ensure that there is no wildlife trapped within the trenches. If wildlife does become trapped or injured, a qualified individual should coordinate with AGFD to address the issue.

Furthermore, maintaining connectivity for the Sonoran desert tortoise through the project area is particularly important for this species. We recommend that any culvert crossings and other drainage structures associated with the proposed project be designed in such a way as to facilitate movements and crossing of the roadway by Sonoran desert tortoises. This may require using a larger sized culvert or other crossing structure. The AGFD recently completed a RTA-funded

study of crossing structure designs that facilitate wildlife movements (www.rtamobility.com/RTAPlan/RTAProjectLink/WildlifeLinkages). Please refer to that study and implement the appropriate designs and structures to reduce potential road mortality and enhance permeability of the improved roadway section.

In summary, we support the implementation of all species-specific mitigation measures outlined in the draft BE with the recommended changes and additions described herein.

This letter is not intended to express any requirement of, or conditions necessary for compliance with, the Endangered Species Act. Our comments are provided to you as technical assistance regarding how effects of the proposed road relocation project on biological resources can be minimized, but they do not constitute legal requirements. Specific discussions related to ESA compliance will occur once the Federal Aviation Administration or other Federal action agency has made a determination regarding the effects of the action on listed species and whether section 7 consultation, pursuant to the Act, is required.

Should circumstances regarding this project change from the information provided to us, we recommend that you contact us for further review. Thank you for the opportunity to provide input on this project. If you have any questions regarding our comments, or need any additional information, please contact Cat Crawford at (520) 670-6150 (x232) or Scott Richardson at (x 242).

Sincerely,

for *Jean Calhoun for*
Steven L. Spangle
Field Supervisor

cc (hard copy):
Field Supervisor, Fish & Wildlife Service, Phoenix, AZ (2 copies)
Jean Calhoun, Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
cc (electronic copy):
SWCA, Tucson, AZ (Attn: Angela Barclay)
Habitat Branch Chief, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: John Windes)

C:\Users\catcrawford\Documents\Section 7\Pima County\Pima Co Hughes Access Road Relocation.ta.cc.docx

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_____. 2008. May 22, 2008, Technical Memorandum regarding the survival of transplanted Pima pineapple cactus on the Sycamore Highland Proper

APPENDIX F

Saguaro Maps with Locations

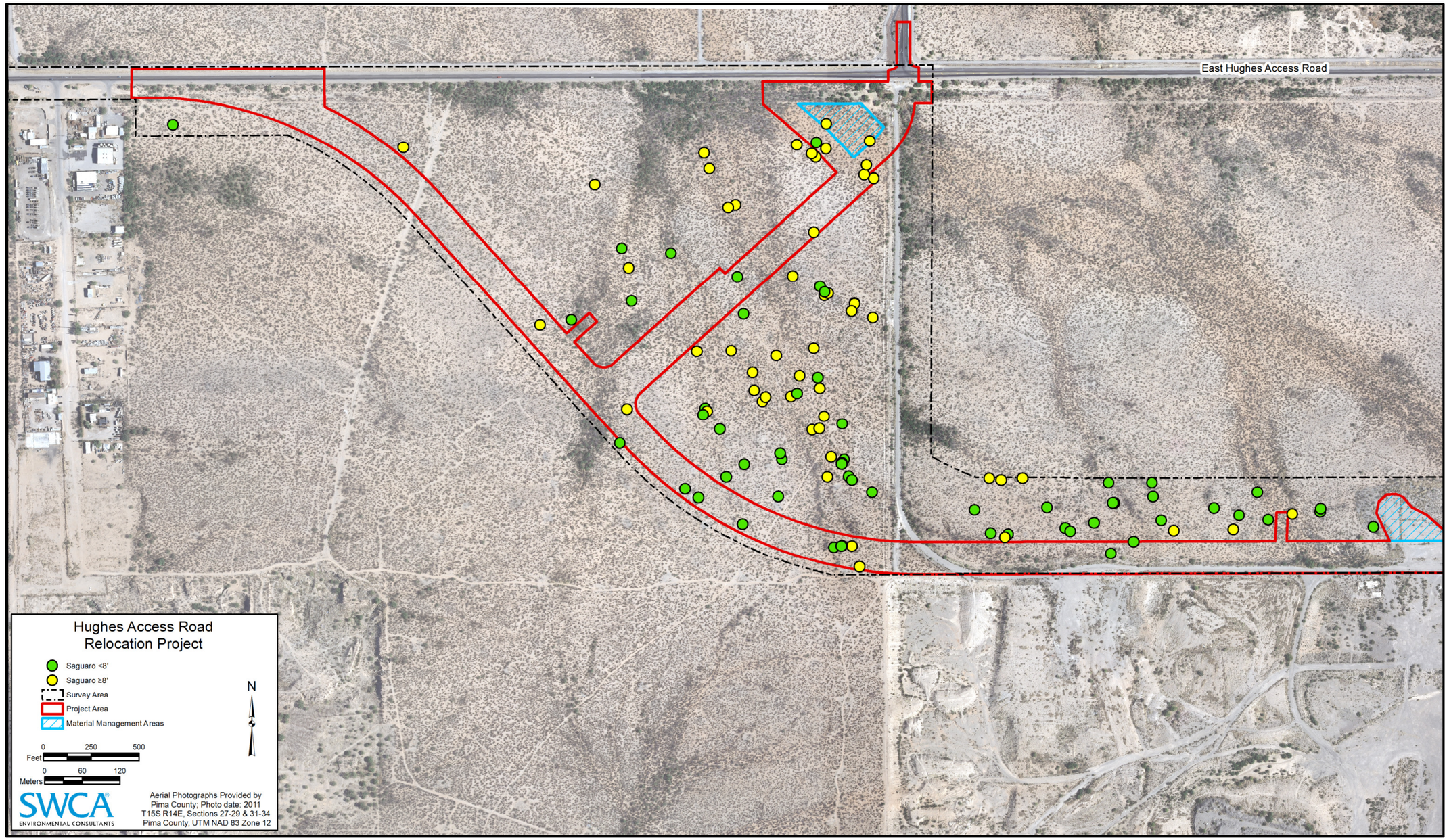

Figure F-1. Saguaro locations.

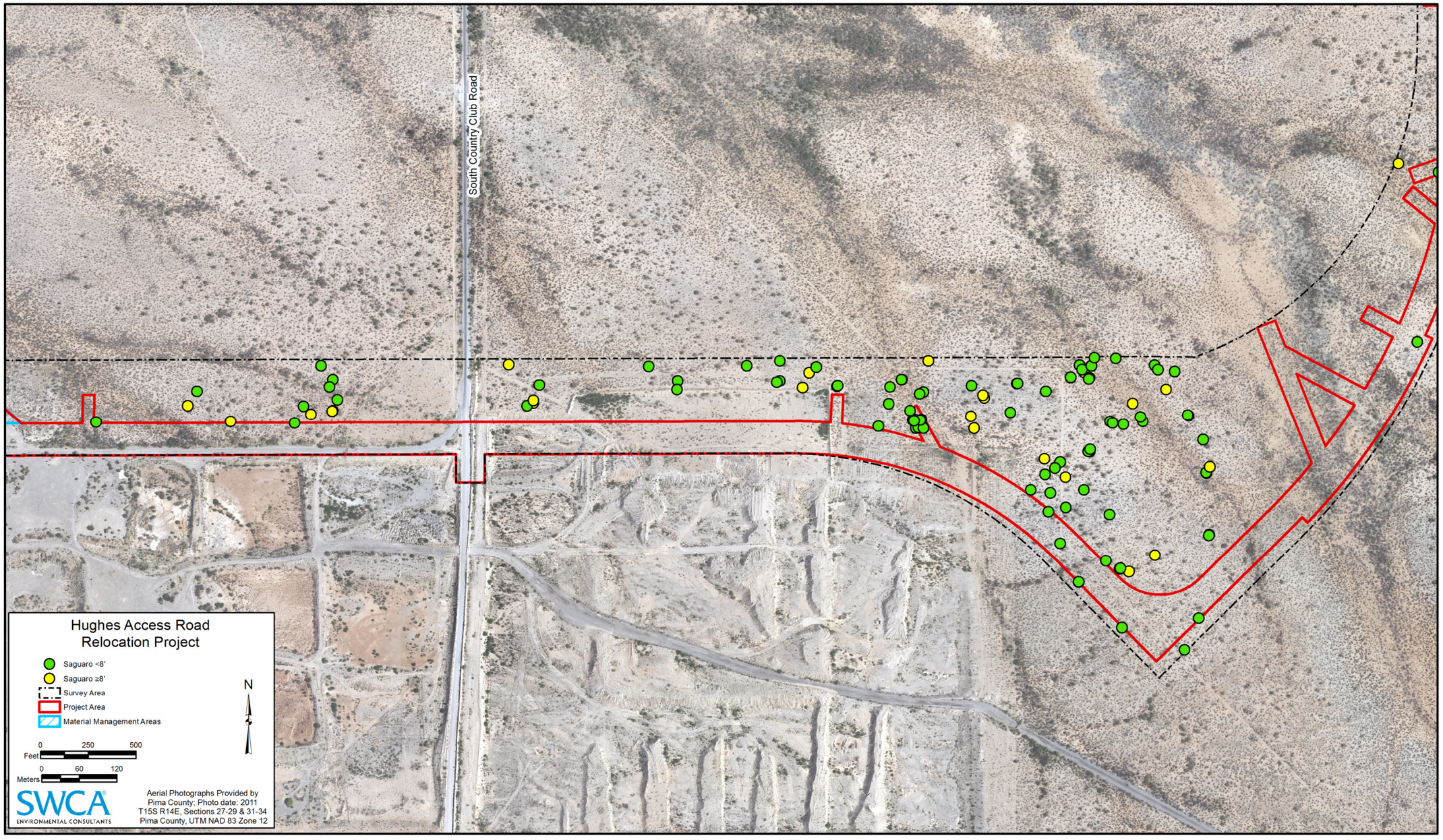

Figure F-2. Saguaro locations.

Figure F-3. Saguaro locations.

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APPENDIX G

Pima Pineapple Cactus Data and Maps with Locations

Table G-1. Pima Pineapple Cactus Data

Plant ID	Coordinates*		Plant Diameter (mm)	Condition (good, fair, poor)	Number of Pups and Stems	Comments
	Easting	Northing				
a	507174	3549680	130	Fair	1 stem, 0 pups	Cut in ½ – at edge of road
1	508523	3550277	100	Good	1 stem, 0 pups	Healthy
2	506990	3549787	110	Poor	1 stem, 0 pups	Stressed, disturbed
3	507011	3549820	180	Good	1 stem, 1 pup	Healthy
4	507186	3549795	150	Good	1 stem, 4 pups	Healthy
5	507227	3549775	95	Fair	1 stem, 0 pups	Healthy
6	507430	3549791	100	Good	1 stem, 2 pups	Healthy
7	507428	3549836	110	Good	1 stem, 1 pup	Healthy
8	507284	3549857	95	Poor	1 stem, 0 pups	Stressed
9	507259	3549861	180	Good	1 stem, 8 pups	Healthy
10	507210	3549846	110	Good	1 stem, 0 pups	Healthy
11	507182	3549848	70†	Good	3 stems, 0 pups	3 dead stems
12	507232	3549693	120	Good	1 stem, 4 pups	Healthy
13	507252	3549674	100	Good	1 stem, 0 pups	Healthy
14	507590	3549675	130	Good	1 stem, 2 pups	Healthy
15	507598	3549682	130	Great	2 stems, 0 pups	Healthy
16	507473	3549632	110	Good	1 stem, 4 pups	Healthy
17	507318	3549649	120	Good	1 stem, 2 pups	Healthy
18	506838	3549780	110	Good	1 stem, 0 pups	Healthy
19	506839	3549787	90	Good	1 stem, 0 pups	Healthy
20	506530	3549752	120	Good	1 stem, 7 pups	Healthy
21	506565	3549712	130	Good	1 stem, 2 pups	Healthy
22	506697	3549685	90	2nd stem is dead	1 stem, 0 pups	Healthy
23	506688	3549680	120	Good	1 stem, 1 pup	Healthy
24	506843	3549718	130	Good	1 stem, 0 pups	Healthy
25	507096	3549774	80	Good	1 stem, 0 pups	Healthy
26	508510	3550431	120	Good	1 stem, 0 pups	Healthy
27	507418	3549726	100	Good	1 stem, 1 pup	Healthy
110	507138	3549663	5	Good	1 stem, 0 pups	Healthy
111	506091	3549685	12	Good	1 stem, 2 pups	Healthy

* Universal Transverse Mercator (UTM) coordinates, Zone 12, North American Datum (NAD) 83.
† Diameter of largest stem.

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Figure G-1. Pima pineapple cactus locations and soil types.

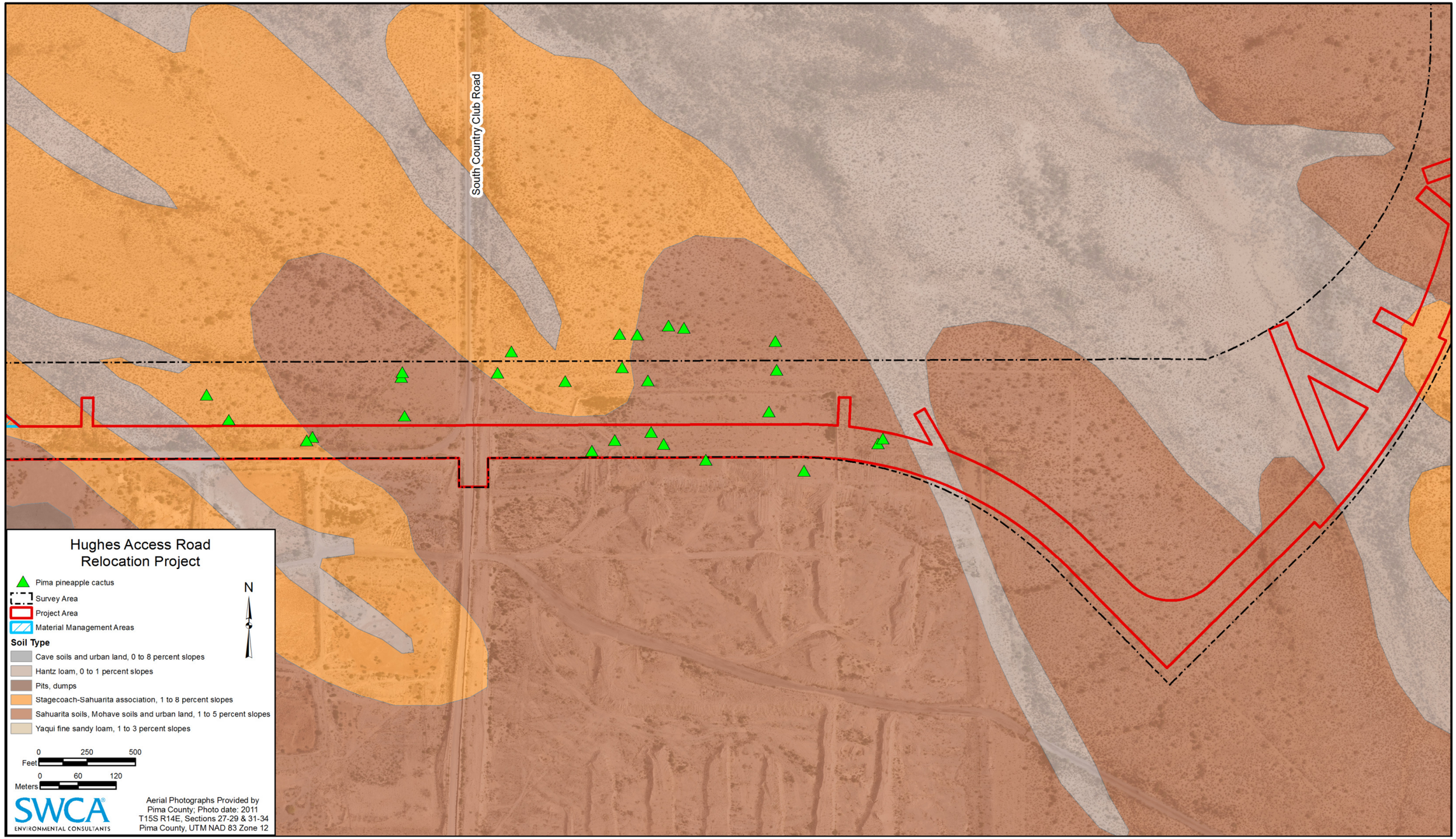

Figure G-2. Pima pineapple cactus locations and soil types.

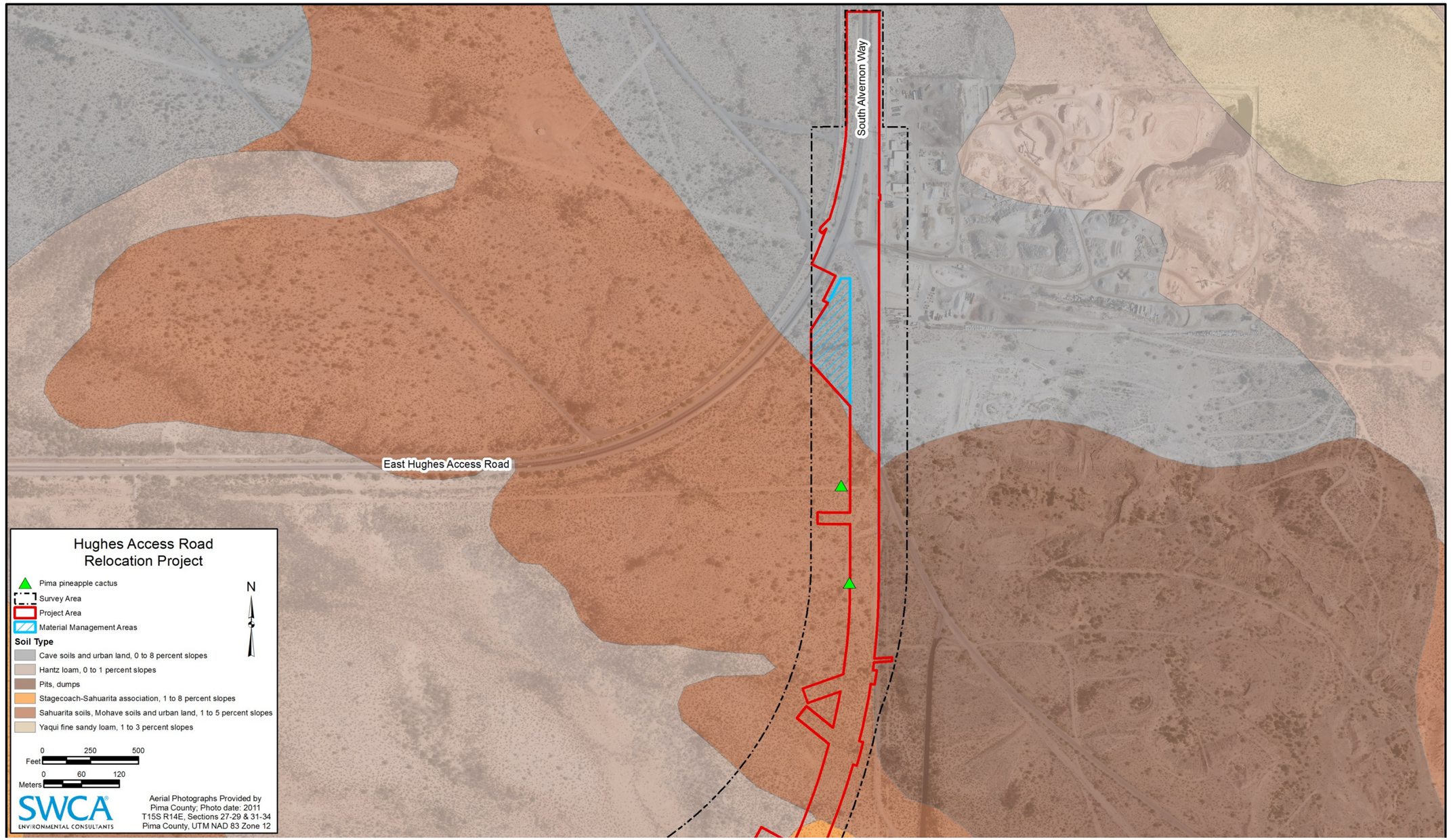

Figure G-3. Pima pineapple cactus locations and soil types.

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APPENDIX H

Arizona Game and Fish Department's Guidelines for Handling Sonoran Desert Tortoises

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.

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
02EAAZ00-2014-F-0077

November 14, 2014

RECEIVED
NOV 18 2014
Federal Aviation Administration
Western-Pacific Region
Airports Division - AWP-600

Mr. David B. Kessler
Federal Aviation Administration
P.O. Box 92007
Los Angeles, California 90009-2007

Dear Mr. Kessler:

This biological opinion responds to your September 5, 2014 request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was received on September 8, 2014. At issue are impacts resulting from the proposed relocation of the East Hughes Access Road located south of the Tucson International Airport in the City of Tucson, Pima County, Arizona, on the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) (PPC).

In your correspondence, you also requested our concurrence that the proposed action may affect, but is not likely to adversely affect the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*). Our concurrence is provided in Appendix A of this biological opinion.

As indicated in the biological assessment (BA), the Sonoran desert tortoise (*Gopherus morafkai*) is a candidate species under the Act. As such, it receives no regulatory protection under the Act and you are not required to consult on this species under the Act for this project. We will not discuss this species further in this biological opinion (BO). However, we are supportive of any actions that the project proponents can take to further the conservation of this species within the project area. We recommend complete implementation of the proposed Sonoran desert tortoise conservation measures outlined in the BA (see page 28 of the BA).

This BO is based on information provided in your September 5, 2014, correspondence, including SWCA's September 2014 Biological Assessment (BA) of the proposed action. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, roadway construction, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at Arizona Ecological Services Office (AESO) in Phoenix, Arizona.

Consultation History

- August 21, 2013 – The Service met with Pima County staff to discuss the proposed project and potentially affected listed species.
- November 27, 2013 – A draft BA was submitted to the Service for review and comment.
- January 16, 2014 – The Service provided comments on the draft BA in the form of a technical assistance letter.
- September 5, 2014 – The Federal Aviation Administration (FAA) requested formal consultation with the Service on the effects of East Hughes Access Road Relocation Project, and provided a BA and background information related to the proposed action.
- October 15, 2014 – The Service provided the draft BO to the Corps for their review.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Tucson Airport Authority's (TAA) and the Pima County Department of Transportation's (PCDOT) purpose of this project is to relocate the existing East Hughes Access Road to comply with the safety arc imposed by the United States Air Force (USAF) for USAF Plant 44 adjacent to the road that is leased by Raytheon Missile Systems (Raytheon) and to implement that part of the Tucson International Airport's (TUS) Airport Layout Plan (2014). The TAA's and PCDOT's need for this project is for East Hughes Access Road to comply with USAF safety arc for USAF Plant 44 facilities leased by Raytheon. The FAA's statutory mission is to ensure the safe and efficient use of navigable airspace in the United States. The FAA must ensure that the Proposed Action does not impair the safety of aircraft and airport operations at the TUS. The Proposed Action would improve transportation access to and at TUS, and would support the safe and efficient use of navigable airspace in the United States.

The TAA and the PCDOT are proposing to relocate the existing paved, two-lane, undivided section of East Hughes Access Road immediately south of TUS from just east of South Old Nogales Highway to South Alvernon Way (see Figures 1 and 2 of the BA). The proposed project would construct a new two-lane section of East Hughes Access Road approximately 2,500 feet south of the existing alignment, for a total length of approximately 3.9 miles, within a 150- to 170-foot-wide roadway corridor. The proposed project is estimated to permanently impact 106 acres of which 79.57 acres would be for new Right of Way (ROW) acquisition, 7.55 acres for drainage easements, 4.93 acres for potential material management areas, and 13.75 acres for potential impacts within existing ROW consisting of pavement removal and clearing and grubbing areas. The project would shift current traffic[1] from the existing two-lane alignment to the new location with two lanes. Traffic volumes are not anticipated to significantly increase on the relocated roadway, so Pima County has determined that maintaining the relocated roadway with two lanes is adequate to handle traffic volumes. The project would change the project area from undeveloped land to a two-lane roadway (one lane in each direction). It is anticipated that construction and reclamation actions will take approximately 12 months.

[1] Average daily traffic is currently estimated at 14,600 vehicles per day.

The proposed project also includes the following construction activities (see Figure 3 of the BA for the specific locations of each of these activities):

1. relocation of existing two-lane undivided roadway and tie-back into East Hughes Access Road and the extension of South Alvernon Way;
2. two 11-foot lanes with 10-foot shoulders on either side of the roadway (6 feet paved and 4 feet graded) (Figure 4);
3. construction of an approximately 0.4-mile-long entry road to USAF Plant 44 (i.e., South Hughes Access Road);
4. tie-back of new South Hughes Access Road into existing South Hughes Access Road
   (i.e., entry road to USAF Plant 44);
5. stripe obliteration and restriping of South Hughes Access Road on USAF property (i.e., entry road to USAF Plant 44;
6. removal of pavement at tie-backs on the west and east ends to prevent access from the relocated East Hughes Access Road to the existing East Hughes Access Road;
7. construction of turn lanes at the intersections of the relocated East Hughes Access Road with South Hughes Access Road, South Country Club Road, and South Alvernon Way;
8. new traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Hughes Access Road;
9. new flashing traffic signal and low-voltage, directional lighting at the new intersection of East Hughes Access Road and South Alvernon Way;
10. relocation of the T-intersection of East Hughes Access Road and South Country Club Road 2,500 feet south of the existing location;
11. relocation of the driveway on South Alvernon Way for the access road to existing businesses 160 feet southeast of the existing driveway location;
12. construction of drainage improvements at 17 locations (Appendix D includes locations of drainage improvements, typical cross section, plan and profile, and detail graphic);
13. removal of 4.1 acres of pavement—0.9 acre of existing East Hughes Access Road and South Alvernon Way and 3.2 acres of existing wildcat roads;
14. potential use of approximately 5 acres for material management areas outside new ROW that the contractor may use for the storage of equipment and materials during construction;[2] and
15. relocation of overhead utilities (i.e., Tucson Electric Power, CenturyLink, and Comcast); and
16. to construct the relocated roadway, Pima County will acquire and establish the road ROW and drainage easements. Of the 79.57 acres of new ROW needed, Pima County will purchase at fair market value 51.12 acres from TAA and 4.49 acres from COT, and establish 23.96 acres of ROW from Pima County owned property.

[2] Material management areas are ones that the contractor may use for the storage of equipment during construction. The three material management areas each have different land ownership: Pima County, the TAA, and the COT. The material management areas were chosen in soil types that do not provide habitat for PPC within the project area (or within disturbed areas where no PPC were found) and would have minimal impact to saguaros. Although these areas have been identified, it is possible that they will not need to be used because the new ROW is expected to be able to accommodate all the necessary equipment and materials.

> Of the 7.55 acres of drainage easements, Pima County will purchase 6.04 acres from TAA at fair market value and dedicate 1.51 acres from Pima County owned property for construction of the relocated roadway.

Project planning would restrict disturbances to within the project area. Impacts to existing vegetation would be minimized in the following ways: project plans would clearly depict project limits, and special provisions would note that contractor must stay within the project limits; initial staking and marking during pre-construction survey to clearly define project limits (i.e., ROW and easement boundaries) in the field and installation of strategically placed preservation fencing around sensitive vegetation (e.g., saguaros, PPC, and xeroriparian habitat in and near ephemeral drainages) prior to commencing construction activities would distinguish areas for construction from areas for preservation; and maintenance of existing traffic would be limited to the east and west connection points of the project, so the contractor would have more flexible use of the ROW since it does not have to be shared with traffic. To minimize erosion and sedimentation, and hence stormwater pollution, during and after construction activities, a stormwater pollution prevention plan (SWPPP) will be prepared and implemented.

Conservation Measures

The following non-species-specific conservation measures have been incorporated into the project design.

Pima County Responsibilities

- Protected native plants within the project will be impacted by this project; therefore, Pima County will send the notification to the Arizona Department of Agriculture at least 60 calendar days prior to the start of construction.
- Pima County shall prepare a SWPPP that meets the requirements of the current Arizona Pollutant Discharge Elimination System general permit for Discharge from Construction Activities to Waters of the U.S. (WUS).

Pima County Design Responsibilities

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.
- The new lighting that will be installed at the new East Hughes Access Road and South Alvernon Way intersection and the new East Hughes Access Road and South Hughes Access Road will be low-voltage, directional lighting.
- Culverts have been designed consistent with the recommendations to improve wildlife connectivity in the Arizona Game and Fish Department's (AGFD's) study of crossing structure designs that facilitate wildlife movements (AGFD 2011) (see Appendix D of the BA).

Contractor Responsibilities

- The contractor shall identify and treat noxious and invasive species infestations (e.g., buffelgrass) prior to construction consistent with PCDOT's Special Provision 201-3.04, *Noxious and Invasive Vegetation*.

- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity. This will include seeding of approximately 68 acres of disturbed areas with two seed mixes for the first application and approximately 17 acres for the second application,[3] including areas where pavement removal of existing roads would occur.
- The contractor shall follow the PCDOT's standard specifications for dust suppression during construction (Section 207) and shall obtain an air quality permit for dust from the Pima County Department of Environmental Quality.
- The contractor shall certify that the SWPPP prepared by Pima County meets the requirements of the currently Arizona Pollutant Discharge Elimination System general permit for Discharge from Construction Activities to WUS.

Pima County proposes the following conservation measures to minimize the effects of the proposed project on lesser long-nosed bats:

- Protect in place (including constructing fencing at 11 locations within or along the ROW to minimize or avoid impacts to saguaros), salvage and transplant, or replace all saguaros from the project area to within the adjacent ROW.
- Salvage or transplant affected saguaros on-site at 1:1 ratio, monitor all transplanted saguaros for 10 years, and if any transplanted saguaros die within the 10-year monitoring period, replace with 4- to 6-foot-tall saguaros at 1:1 ratio.
- Construct temporary fencing at 10 culvert locations where xeroriparian vegetation is associated with potentially jurisdictional WUS to protect and maintain maximum coverage of xeroriparian habitat and reduce impacts to sensitive species such as lesser long-nosed bats.

Pima County proposes the following conservation measures to minimize the effects of the proposed project on PPC:

- Protect in place as many PPC and as much habitat as possible during construction, including constructing fencing at locations within or along the ROW to minimize or avoid impacts to individuals. Additional fencing will be installed within the ROW and drainage easements to protect additional PPC, as needed.
- Pima County proposes the following conservation measures to compensate for the effects of the proposed project on PPC:
    - Purchase 70 acres of mitigation credits for PPC at Pima County's Madera Highlands/Elephant Head properties mitigation bank.[4]

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[3] Second seeding application will occur close to the conclusion of the project in areas that have not been previously seeded and/or in areas where the first seeding application was not successful.

[4] In March 2006, Pima County Natural Resources, Parks and Recreation completed an agreement with USFWS to establish a new PPC conservation bank on two properties. These properties are known as Madera Highlands and Elephant Head and total 528.7

- Salvage and transplant all PPC that cannot be avoided from the project area to within the adjacent ROW and, based on information indicating limited success of transplant efforts on other projects, promote project-specific research into viability of transplanting PPC.

STATUS OF THE SPECIES

Recent investigations of taxonomy and geographical distribution focused in part on assessing the validity of the taxon (see Baker 2004, Baker 2005, and Schmalzel *et al.* 2004). Although there is evidence for a general pattern of clinal variation across the range of the species (Schmalzel *et al.* 2004), this does not preclude the recognition of taxonomic varieties within *C. sheeri* (= *C. robustispina*). Baker (2005) found that there are distinct geographical gaps between the distribution of this subspecies and the other subspecies, which occur in eastern Arizona, New Mexico, and Texas, and that the subspecies are morphologically coherent within their respective taxa (Baker 2004). His geographical and morphological work supports the idea that the sub-specific groups within *C. robustispina* are indeed discrete, and merit separate taxonomic status as subspecies (U.S. Fish and Wildlife Service 2007).

We have determined that PPC that are too isolated from each other may not be effectively pollinated. For example, the major pollinator of PPC is thought to be *Diadasia rinconis*, a ground-nesting, solitary, native bee. McDonald (2005) found that PPC plants need to be within approximately 600 m (1,969 ft.) of each other in order to facilitate effective pollination. Based on this information and other information related to similar cacti and pollinators, we have determined that PPC plants that are located at distances greater than 900 meters from one another become isolated with regard to meeting their life history requirements. The species is an obligate outcrosser (not self-pollinating), so it is important for plants to be within a certain distance to exchange pollen with each other. Also, the study found that pollination was more effective when other species of native cacti are near areas that support PPC. The native bees pollinate a variety of cacti species and the sole presence of PPC may not be enough to attract pollinators.

The PPC occurs south of Tucson, in Pima and Santa Cruz counties, Arizona, as well as in adjacent northern Sonora, Mexico. In Arizona, it is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. This cactus generally grows on slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas. The plant is found at elevations between 2,360 feet (ft.) and 4,700 ft. (Phillips *et al.* 1981, Benson 1982, Ecosphere Environmental Services Inc. 1992), in vegetation characterized as either or a combination of Arizona upland of the Sonoran desertscrub community and semi-desert grasslands (Brown 1982, Johnson 2004). Paredes-Aguilar *et al.* (2000) reports the subspecies from oak woodlands in Sonora. Several attempts have been made to delineate habitat within the range of PPC (McPherson 2002, RECON Environmental Inc. 2006, U.S. Fish and Wildlife Service unpublished analysis) with limited success. As such, we

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acres, of which 494.0 acres were available for future mitigation credits for county-owned projects affecting PPC. Currently there are over 460 one-acre credits available for use, and although the acre credits are not allocated by location, but rather total credits available for the established bank, the two locations of the two properties are within Pima County. The Madera Highlands site is located 15.5 miles to the south of the unincorporated Three Points area on Highway 286, near milepost 27 at Altar Wash and is approximately 31 miles southwest of the project limits. The Elephant Head site is located 4.5 miles to the east of Interstate 19 near milepost 33 in the unincorporated Canoa Ranch area and is approximately 22 miles south of the project limits.

are still unable to determine exact ecological characters to help us predict locations of PPC or precisely delineate PPC habitat (U.S. Fish and Wildlife Service 2007), except perhaps in localized areas (U.S. Fish and Wildlife Service 2005). We appreciate the discussion in the BA regarding the extent of potential habitat within the range of the PPC, but the existing uncertainty regarding habitat characteristics and the lack of a range-wide scientific PPC habitat evaluation result in only being able to discuss these attributes in a general manner.

As a consequence of its general habitat requirements, considerable habitat for this species appears to exist in Pima and Santa Cruz counties, much of which is unoccupied. PPC occurs at low densities, widely scattered, sometimes in clumps, across the valley bottoms and bajadas. The species can be difficult to detect, especially in dense grass cover. For this reason, systematic surveys are expensive and have not been conducted extensively throughout the range of the PPC. As a result, location information has been gathered opportunistically, either through small systematic surveys, usually associated with specific development projects, or larger surveys that are typically only conducted in areas that seem highly suited for the species. Furthermore, our knowledge of the distribution and status of this species is gathered primarily through the section 7 process; and we only see projects that require a Federal permit or have Federal funding. There are many projects that occur within the range of PPC that do not undergo section 7 consultation, and we have no information regarding the status or loss of plants or habitat associated with those projects. For these reasons, it is difficult to address abundance and population trends for this species. We do not find that the best available information allows for very specific PPC population estimates such as was presented in the BA. The approach and methodology used to make the PPC population estimates in the BA limit their reliability and utility as we analyze the effects of the proposed action on the conservation and recovery of this species.

The Arizona Game and Fish Department maintains the Heritage Data Management System (HDMS), a database identifying elements of concern in Arizona and consolidating information about their distribution and status throughout the state. This database has 5,553 PPC records, 5,449 PPC of which have coordinates. Some of the records are quite old, and we have not confirmed whether the plants are still alive. We also cannot determine which plants may be the result of multiple surveys in a given area. Of the known individuals (5,553), approximately 1,340 PPC plants are documented in the database as extirpated as of 2003. There have been additional losses since 2003, but that information is still being compiled in the database. The database is dynamic, based on periodic entry of new information, as time and staffing allows. As such, the numbers used from one biological opinion to the next may vary and should be viewed as a snapshot in time at any given moment. We have not tracked loss of habitat because a limited number of biological assessments actually quantify habitat for PPC.

We do know the number and fate of PPC that have been detected during surveys for projects that have undergone section 7 consultation. Through 2014, section 7 consultations on development projects (e.g., residential and commercial development, mining, infrastructure improvement) considered 2,939 PPC plants found on approximately 15,771 acres within the range of the PPC. Of the total number of plants, 2,170 PPC (74 percent) were destroyed, removed, or transplanted as a result of development, mining, and infrastructure projects. In terms of PPC habitat, some of the 15,771 acres likely did not provide PPC habitat, but that amount is difficult to quantify because PPC habitat was not consistently delineated in every consultation. Of the 15,771 acres,

however, we are aware that 15,106 acres (96 percent) have been either permanently or temporarily impacted. Some of these acres may still provide natural open space, but we have not been informed of any measures (e.g., conservation easements) that have been completed to ensure these areas will remain open. Through section 7 consultation on non-development-related projects (e.g., fire management plans, grazing, buffelgrass control), we are aware of an additional 781 plants within an unknown number of acres; we do not know the number of acres because these types of projects are often surveyed for PPC inconsistently, if at all. Across the entire PPC range, it is difficult to quantify the total number of PPC lost and the rate and amount of habitat loss for three reasons: 1) we review only a small portion of projects within the range of PPC (only those that have Federal involvement and are subject to section 7 consultation), 2) development that takes place without any jurisdictional oversight is not tracked within Pima and Santa Cruz counties, and 3) many areas within the range of the PPC have not been surveyed; therefore, we do not know how many plants exist or how much habitat is presently available.

Some additional information related to the survival of PPC comes from six demographic plots that were established in 2002 in the Altar Valley. The results from the first year (2002-2003) indicate that the populations were relatively stable; out of a total of over 300 PPC measured, only 10 died, and two PPC seedlings were found (Routson *et al.* 2004). The plots were not monitored in 2004, but were visited again starting in May 2005. In the two years between September 2003 and September 2005, 35 individuals, or 13.4 percent, of the original population had died and no new seedlings were found (Baker 2006). Baker (2006) suggests that recruitment likely occurs in punctuated events in response to quality and timing of precipitation, and possibly temperature, but there is little evidence until such events occur. He goes on to say that further observations need to be made to determine the rate at which the population is declining, because, based on an overall rate of die-off of 13.4 percent every two years, few individuals will be alive at this site after 15 years. As this monitoring program continues, critical questions regarding the life cycle of this species will be answered.

Threats to PPC continue to include habitat loss and fragmentation, competition with non-native species, drought and climate change, and inadequate regulatory mechanisms to protect this species. We believe residential and commercial development, and its infrastructure, is by far the greatest threat to PPC and its habitat. However, we have only a limited ability to track the cumulative amount of development within the range of PPC. What is known with certainty is that development pressure continues in Pima and Santa Cruz counties.

Invasive grass species may be a threat to the habitat of PPC. Habitat in the southern portion of the Altar Valley is now dominated by Lehmann lovegrass (*Eragrostis lehmanniana*). According to Gori and Enquist (2003), Boer lovegrass (*Eragrostis chloromelas*) and Lehmann lovegrass are now common and dominant on 1,470,000 acres in southeastern Arizona. They believe that these two grass species will continue to invade native grasslands to the north and east, as well as south into Mexico. These grasses have a completely different fire regime than the native grasses, tending to form dense stands that promote higher intensity fires more frequently. Disturbance (like fire) tends to promote the spread of these non-natives (Ruyle *et al.* 1988, Anable *et al.* 1992). Roller and Halvorson (1997) hypothesized that fire-induced mortality of PPC increases with Lehmann lovegrass density. Buffelgrass (*Pennisetum ciliare*) has become locally dominant in vacant areas in the City of Tucson and along roadsides, notably in the rights-of-way along

Interstate 10 and State Route 86. Some portions of PPC habitat along these major roadways are already being converted to dense stands of buffelgrass, which can lead to recurring grassland fires and the destruction of native desert vegetation (Buffelgrass Working Group 2007).

The effects of drought and climate change (i.e., decreased precipitation and water resources) are a threat to the long-term survival and distribution of native plant species, including the PPC. For example, temperatures rose in the twentieth century and warming is predicted to continue over the twenty-first century. Although climate models are less certain about predicted trends in precipitation, the southwestern United States is expected to become warmer and drier. In addition, precipitation is expected to decrease in the southwestern United States, and many semi-arid regions will suffer a decrease in water resources from climate change as a result of less annual mean precipitation and reduced length of snow season and snow depth. Approximately half of the precipitation within the range of the PPC typically falls in the summer months; however, the impacts of climate change on summer precipitation are not well understood. Drought conditions in the southwestern United States have increased over time and may have contributed to loss of PPC populations through heat stress, drought stress, and related insect attack, as well as a reduction in germination and seedling success since the species was originally listed in 1993, and possibly historically. Climate change trends are likely to continue, and the impacts on species will likely be complicated by interactions with other factors (e.g., interactions with non-native species and other habitat-disturbing activities).

The Arizona Native Plant Law can delay vegetation clearing on private property for the salvage of specific plant species within a 30-day period. Although the Arizona Native Plant Law prohibits the taking of this species on State and private lands without a permit for educational or research purposes, it does not provide for protection of plants *in situ* through restrictions on development activities. Even if PPC are salvaged from a site, transplanted individuals only contribute to a population if they survive and are close enough (within 900 m [(2,970 ft.]) to other PPC to be part of a breeding population from the perspective of pollinator travel distances and the likelihood of effective pollination. Transplanted PPC have variable survival rates, with moderate to low levels of survival documented. Past efforts to transplant individual PPC to other locations have had limited success. For example, on two separate projects in Green Valley, the mortality rate for transplanted PPC after two years was 24 percent and 66 percent, respectively (SWCA, Inc. 2001, WestLand Resources, Inc. 2004). One project southwest of Corona de Tucson involved transplanting PPC into areas containing *in situ* plants. Over the course of three years, 48 percent of the transplanted individuals and 24 percent of the *in situ* individuals died (WestLand Resources, Inc. 2008). There is also the unquantifiable loss of the existing PPC seed bank associated with the loss of suitable habitat. Furthermore, once individuals are transplanted from a site, PPC is considered by the Service to be extirpated from that site, as those individuals functioning in that habitat are moved elsewhere.

Pima County regulates the loss of native plant material associated with ground-disturbing activities through their Native Plant Protection Ordinance (NPPO) (Pima County 1998). The NPPO requires inventory of the site and protection and mitigation of certain plant species slated for destruction by the following method: the designation of a minimum of 30 percent of on-site, permanently protected open space with preservation in place or transplanting of certain native plant species from the site. There are various tables that determine the mitigation ratio for

different native plant species (e.g. saguaros, ironwood trees, PPC) with the result that mitigation may occur at a 1:1 or 2:1 replacement ratio. Mitigation requirements are met through the development of preservation plans. The inadvertent consequence of this ordinance is that it has created a "market" for PPC. Any developer who cannot avoid this species or move it to another protected area must replace it. Most local nurseries do not grow PPC (and cannot grow them legally unless seed was collected before the listing). As a result, some environmental consultants are collecting PPC seed from existing sites (which can be done with a permit from the Arizona Department of Agriculture and the permission of the private landowner), germinating seed, and placing PPC plants grown from seed back on these sites. There have been no long-term studies of transplant projects, thus the conservation benefit of these actions is unknown. Moreover, growing and planting PPC does not address the loss of PPC habitat that necessitated the action of transplanting cacti in the first place.

Other specific threats that have been previously documented (U.S. Fish and Wildlife Service 1993), such as overgrazing, illegal collection, prescribed fire, and mining, have not yet been analyzed to determine the extent of effects to this species. However, partial information exists. Overgrazing by livestock, illegal collection, and fire-related interactions involving exotic Lehmann lovegrass and buffelgrass may negatively affect PPC populations. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the plant.

The protection of PPC habitat and individuals is complicated by the varying land ownership within the range of this species in Arizona. An estimated 10 percent of the potential habitat for PPC is held in Federal ownership. The remaining 90 percent is on Tribal, State, and private lands. Most of the federally-owned land is either at the edge of the plant's range or in scattered parcels. The largest contiguous parcel of federally-owned habitat is the Buenos Aires National Wildlife Refuge, located at the southwestern edge of the plant's range at higher elevations and with lower plant densities. No significant populations of PPC are known from Sonora or elsewhere in Mexico (Baker 2005).

There have been some notable conservation developments for this species. As of 2010, there are two conservation banks for PPC, one on a private ranch in the Altar Valley (Palo Alto Ranch Conservation Bank) and another owned by Pima County that includes areas in both the Altar Valley and south of Green Valley. In the Palo Alto Ranch Conservation Bank to date, a total of 700 acres have been conserved through the execution of conservation easements. In Pima County's Bank, a total of approximately 530 acres are under a conservation easement at this time (the County offsets its own projects within this bank). Additionally, three large blocks of land totaling another 1,078 acres have been set aside or are under conservation easements through previous section 7 consultations (see consultations 02-21-99-F-273, 02-21-01-F-101, and 02-21-03-F-0406). While not formal conservation banks, these areas, currently totaling 1,739.6 acres, are set aside and managed specifically for PPC as large blocks of land, and likely contribute to recovery of the taxon for this reason; therefore, we consider these acres conserved. Another 647 acres of land have been set aside as natural open space within the developments reviewed through section 7 consultation between 1995 and 2010. However, these are often small areas within residential backyards (not in a common area) that are difficult to manage and usually isolated within the larger development, and often include areas that do not provide PPC habitat

(e.g., washes). Some conservation may occur onsite because of these open space designations, but long-term data on conservation within developed areas are lacking; the value of these areas to PPC recovery over the long-term is likely not great.

In summary, PPC conservation efforts are currently hampered by a lack of information on the species. Specifically, we have not been able to determine exact ecological characters to help us predict locations of PPC or precisely delineate its habitat, and considerable area within the PPC range has not been surveyed. Further, there are still significant gaps in our knowledge of the life history of PPC; for instance, we have yet to observe a good year for seed germination. From researcher observations and motion sensing cameras, we have learned that ants, Harris' antelope squirrels, and jackrabbits act as seed dispersal agents. Demographic plots have been only recently established, and information is just now beginning to be reported with regard to describing population dynamics for PPC in the Altar Valley.

Development and associated loss of habitat remain important and continuing threats to this taxon. However, the expanding threat of non-native grasses and resulting altered fire regimes are a serious concern for the long-term viability of the species, as is ongoing drought. The full impact of drought and climate change on PPC has yet to be studied, but it is likely that, if recruitment occurs in punctuated events based on precipitation and temperature (Baker 2006), PPC will be negatively affected by these forces. Already we have seen a nearly 25% loss of individuals across six study sites in the Altar Valley between 2010 and 2011; these deaths were attributed largely to drought and associated predation by native insects and rodents (Baker 2011). Conservation efforts that focus on habitat acquisition and protection, like those proposed by Pima County and the City of Tucson, are important steps in securing the long-term viability of this taxon. Regulatory mechanisms, such as the native plant protection ordinances, provide conservation direction for PPC habitat protection within subdivisions, and may serve to reduce PPC habitat fragmentation within areas of projected urban growth.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all Federal actions in the action area that have undergone formal or early section 7 consultation, and impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Description of the Action Area

The action area for this analysis is based on 1) the project area as described above; and 2) areas outside the project area that may be affected by noise, dust, light pollution, and other construction and post-construction activities. The action areas for the lesser long-nosed bat and the PPC are defined by a 1-mile buffer around the project area based on the anticipated effects of the proposed project and the occurrence of these two species in the vicinity of the Proposed Action. Temporally, the potential on-site and off-site impacts resulting from the Proposed

Action encompass all the activities associated with construction and post-construction seeding, and the temporal analysis period includes 12 months of project construction.

The Proposed Action is located along and south of the existing East Hughes Access Road between South Old Nogales Highway and South Alvernon Way within the city of Tucson and unincorporated Pima County (see Figures 1 and 2 of the BA). The lands within and adjacent to the project area are owned by the TAA, the COT, the USAF, and Pima County. Acquisition of ROW and drainage easements for land not currently owned by Pima County would be required from the TAA (this land is obligated under FAA grant assurances and subject to a land release and ALP update approval) and the COT. The existing alignment of East Hughes Access Road is located on a series of ROW easements or leases granted by the TAA, the USAF leased property to Raytheon, and the COT. After East Hughes Access Road is relocated, portions of the existing road that are no longer needed would be abandoned or exchanged for like value, and the rights would be restored to original grantors (TAA, USAF, and COT). Land held by the COT is subject to the TAA master lease and would not be removed from the TUS ALP (2014). A small portion of the proposed action is within the existing Pima County roadway easement on lands owned by the USAF and the COT, and portions of these easements would remain. Adjacent land uses include residential and commercial development, TUS, and open, undeveloped lands.

The action area is located within the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). Xeroriparian vegetation along and within the ephemeral washes is dominated by velvet mesquite (Prosopis velutina) and yellow palo verde (Parkinsonia microphylla) in the overstory and whitethorn acacia (Acacia constricta), wolfberry (Lycium sp.), and graythorn (Ziziphus obtusifolia) in the midstory. Vegetation associated with upland areas is relatively undisturbed and is dominated by creosote bush (Larrea tridentata var. tridentata). Other plant species that occur include saguaro (Carnegiea gigantea), ocotillo (Fouquieria splendens), cholla (Cylindropuntia spp.), barrel cactus (Ferocactus wislizeni), desert zinnia (Zinnia acerosa), desert marigold (Baileya multiradiata), paper flower (Psilostrophe cooperi), globemallow (Sphaeralcea sp.), galleta grass (Pleuraphis sp.), bush muhly (Muhlenbergia porteri), deergrass (M. rigens), and buffelgrass[5] (Pennisetum ciliare). No aquatic habitats (e.g., wetlands, springs, stock tanks, etc.) or broadleaf deciduous riparian vegetation communities occur in the project area.

A. Status of the Species within the Action Area

In April and November 2013, SWCA conducted a pedestrian survey for PPC within the 350-acre survey area surrounding (and including) the project area (300 acres were surveyed in April, and an additional 50 acres were surveyed in November) in accordance with the survey protocol recommended by USFWS. The survey included an area larger than the project footprint in order to evaluate indirect effects and any additional direct effects that may result from unforeseen construction requirements. Survey coverage was accomplished using a modification of the PPC survey techniques in which surveyors spaced approximately 6 m apart made one pass over

[5] This invasive grass species is especially concentrated in the southern portion of TAA property in the vicinity of the proposed project. TAA's buffelgrass eradication plan includes recent surveys (2012 and 2013) and treatments (2013) with herbicide. TAA is scheduled to treat buffelgrass on TAA property (including the areas of the existing and proposed East Hughes Access Roads) in summer 2014 and 2015 (personal communication from E. Roudebush, TAA, to D. Papajohn, PCDOT, February 2014).

suitable areas within the survey area surrounding the project area. Thirty PPC were detected during these surveys (and while conducting other surveys in the project area [i.e., native plant and Sonoran desert tortoise]), of which 9 are within the project area and 21 were in the additional area surveyed outside of the project area (see Appendix G of the BA for data and maps).

The project area lies within the current distribution (USFWS 2008b) and elevational range of PPC (USFWS 2005), there are reported occurrences of this species within 3 miles of the project area (AZHGIS 2013), and individuals were detected during the survey of the project area. Further, the project area contains the following plant species associated with PPC: mesquite, creosote bush, cholla, and barrel cactus. Finally, the soils and slopes in the project are typical of those found in PPC habitat, and the project area is in the Arizona Upland subdivision of the Sonoran Desertscrub biotic community, as defined by Brown (1994). Within the project area, PPC is found growing in two soil types: Sahuarita soils, Mohave Soils, and urban land with 1% to 5% slopes; and Stagecoach-Sahuarita Association with 1% to 8% slopes. There are approximately 250 acres of these soils types (for this analysis, we consider these soils and associated vegetation communities to be suitable PPC habitat) within the survey area that was surveyed for this species and approximately 70 acres of PPC habitat (based on the definition above) are found within the 106-acre project area (see Appendix G of the BA for maps).

B. Factors Affecting Species Environment within the Action Area

PPC within the action area are protected from some of the threats faced by this species in other portions of its range. Threats such as urban development and recreational off-road vehicle use are limited because the action area is primarily lands owned by TAA and these types of activities are limited because of the restrictions and access control related to airport activities in the vicinity of these lands. There is an area within the action area (borrow pit/sand and gravel pit) that has been previously disturbed as a result of materials extraction. Some PPC were found along the periphery of this disturbed area. Therefore, the primary threats to PPC in the action area are related to future materials extraction or construction of facilities related to airport activities.

Ongoing urbanization and residential development adjacent to project area and within the action area are likely to continue at some level. Such activities can affect the conservation and recovery of PPC within the action area if such actions increase PPC habitat loss and fragmentation. The conservation and recovery of this species is dependent on maintaining large blocks of unfragmented habitat that are supported by appropriate habitat connectivity. These habitat configurations are necessary for this species to provide for seed dispersal, the maintenance of a seed bank, and the ongoing occurrence of pollinators and other plant species that support the pollinators of PPC.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent

actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The proposed relocation of the East Hughes Access Road and associated drainage facilities will permanently disturb 106 acres of land within the action area. Not all of these acres provide potential PPC habitat. It is estimated that there will be 70 acres of PPC habitat impacted by the proposed action. Accordingly, direct effects from the proposed action will be the loss of approximately 70 acres of PPC habitat and the removal of nine of the 30 PPC found within the area of the project surveyed for PPC.

To compensate for the permanent loss of PPC habitat and the impacts to at least nine individual PPC, Pima County has agreed to purchase 70 acres of credits from the County's existing Madera Highlands/Elephant Head PPC conservation bank. In addition, individual PPC that fall within the construction footprint (according to the BA, there are nine PPC within the construction footprint) will be transplanted to areas within the adjacent ROW for this project. Although the documented transplant success of PPC is low, these results may not be representative because of the small sample size of transplant efforts. Pima County has agreed to monitor and report the results of this transplant effort. Documentation of the success of this transplant effort will increase our understanding of the effectiveness of salvaging and transplanting PPC as a conservation tool, and will potentially result in additional conservation benefits for the species.

Indirect effects of the Proposed Action include the potential to affect PPC from changed or excess drainage from the roadway, as well as the potential for increased presence of non-native, invasive plant species. Pima County has located drainage structures away from areas that support PPC. In addition, disturbed areas will be reseeded and/or landscaped in an effort to reduce erosion and stabilize soils in the vicinity of existing and transplanted PPC. Pima County has also committed to identify and treat areas of invasive species infestations prior to construction. This will reduce the potential for reestablishment of these species following construction. During construction, all equipment will be washed before entering the construction area, and all materials (soil, vegetation, etc.) will be removed from the equipment before leaving the construction area. Following construction, Pima County will conduct ongoing efforts to identify, remove, and eradicate non-native species infestations.

No interdependent or interrelated effects were identified for this project because the project has independent utility related to improved access and transportation circulation, as wells as bringing the roadway into compliance related to the required buffers associated with Raytheon.

PPC will not be able to survive in the long-term in small, fragmented areas surrounded by urban development. Large, contiguous blocks of habitat need to be managed for their natural values. The Service will continue to work with Pima County to address this need through planning and project implementation of future projects. All of the proposed conservation actions included in the BA for this project and this BO are necessary to offset impacts to PPC and its habitat.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Federal lands adjacent to the project area include those owned by the United States Air Force (USAF) Plant 44 (leased by Raytheon) and TAA-owned lands that are obligated to the FAA. Cumulative effects include changes in land use and development patterns. The proposed project is a roadway relocation project that may alter land uses and development patterns of adjacent properties to aerospace uses by providing better access to these properties and could result in cumulative effects on the PCC similar to the indirect effects described above. Changes to roadway traffic levels may result should development occur on adjacent properties; however, any future projects to address roadway capacity would require separate environmental review actions. Any development of adjacent properties on TAA land would also be subject to separate environmental evaluations and Section 7 consultation, if required. The relocation of East Hughes Access Road would allow the USAF and Raytheon to continue the current operations at Plant 44 without needing a waiver for proximity to the roadway. Pima County and the TAA are not aware of any additional future developments in the action area.

CONCLUSION

After reviewing the current status of the PPC, the environmental baseline for the action area, the effects of the proposed stormwater control structures, and the cumulative effects, it is our biological opinion that the East Hughes Access Road relocation project, as proposed, is not likely to jeopardize the continued existence of the Pima pineapple cactus. No critical habitat has been designated for this species; therefore, none will be affected. This conclusion is based on the full implementation of the project as described in the Description of the Proposed Action section of this document, particularly the conservation measures that were incorporated into the project design and proposed action. Specifically:

- A relatively small number of individual PPC (9) will be directly or indirectly affected by the proposed action. The affected PPC will be transplanted within the adjacent ROW and will continue to contribute to the population at some level. Measures are included in the Proposed Action that will reduce potential indirect effects related to drainage and non-native invasive species.
- The loss of occupied PPC habitat is offset by the conservation in perpetuity of 70 acres of PPC habitat being acquired in the County's existing PPC Conservation Bank. This will contribute to the conservation of core blocks of PPC habitat within its range.

INCIDENTAL TAKE STATEMENT

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally-listed endangered plants from areas under

Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law. However, neither incidental take nor recovery permits are needed from the Service for implementation of the proposed action.

Disposition of Dead or Injured Listed Species (Lesser long-nosed bat)

Upon locating a dead, injured, or sick listed species, initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are **discretionary** agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. While implementation is not required, the Service is providing the following recommendations to assist the FAA in its obligation to conserve federally-listed species, when the FAA has an opportunity to do so.

1) We recommend that, when TAA and Pima County work to conserve PPC on lands in the vicinity of TUS, and if appropriate, survey and monitoring efforts be implemented to locate and identify PPC on lands each agency controls.

2) Since success of transplanting PPC is not well documented, we recommend FAA work with Pima County and the Service to monitor the success of the PPC transplant efforts associated with this project and when possible, other projects in the area for a period of five (5) years following the opening of the roadway for use by the public. Monitoring of the individual transplanted PPC would be accomplished using appropriate procedures to document positive and negative changes in the transplanted PPC from year to year. We also recommend monitoring of those individual PPC not transplanted within the ROW for the roadway project during this same five year period to gain a better understanding of any indirect effects on PPC by changes in localized surface water flow from storm events, and changes, if any, resulting from proximity to the new road or other associated ground disturbances. We recommend FAA provide an annual report on this monitoring effort to this office.

3) We recommend that the TAA and Pima County continue to address invasive species issues within TAA lands, and the proposed relocated East Hughes Access Road, respectively.

Mr. David B. Kessler

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the reinitiation request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Our office appreciates the FAA's efforts to identify and minimize effects to listed species from this project. For further information please contact Scott Richardson (520) 670-6150 (x242) or Jean Calhoun (520) 670-6150 (x223). Please refer to the consultation number 02EAAZ00-2014-F-0077 in future correspondence concerning this project.

Sincerely,

For

Steven L. Spangle
Field Supervisor

cc (hard copy):
Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2 copies)
Jean Calhoun, Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

cc (electronic copy):
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ (pep@azgfd.gov)
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: John Windes)
SWCA, Tucson, AZ (Attn: Angela Barclay)
Pima County Department of Transportation, Tucson, AZ (Attn: Karla Wise)

C:\Users\scottrichardson\Documents\Section 7-10\Hughes Access Road Final BO 11_14_14.sr.doc

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APPENDIX A.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuenae*)

Environmental Baseline

This species is known from grasslands, arid scrublands, and oak woodlands below 5500 ft. in elevation. In Arizona, these bats arrive in mid- April, roosting in caves, abandoned mine shafts and tunnels. Young are typically born in maternity colonies in mid-May. Females and young remain in maternity roosts and forage on primarily saguaros below about 3500 ft. until approximately mid-July. At this time, the range expands and bats are found up to about 5500 ft. in areas of semi-desert grassland and lower oak woodland, foraging primarily on agaves. These bats typically leave southern Arizona by late September to early October.

The primary threats to the lesser long-nosed bat are roost site loss or disturbance and impacts to forage availability (FWS 2007b). Other threats that have contributed to the current endangered status of the species include roost disturbance and deterioration, border activities, recreation, vandalism, fire, vampire bat control, mine closures, and forage availability. The effects of climate change (i.e., decreased precipitation and water resources) are a threat to many species, including the lesser long-nosed bat (Lenart 2007). For example, temperatures rose in the twentieth century and warming is predicted to continue over the twenty-first century. Although climate models are less certain about predicted trends in precipitation, the southwestern United States is expected to become warmer and drier. In addition, precipitation is expected to decrease in the southwestern United States, and many semi-arid regions will suffer a decrease in water resources from climate change as a result of less annual mean precipitation and reduced length of snow season and snow depth. Approximately half of the precipitation within the range of the lesser long-nosed bat typically falls in the summer months; however, the impacts of climate change on summer precipitation are not well understood. Drought conditions in the southwestern United States have increased over time and may have contributed to loss of lesser long-nosed bat populations since the species was originally listed in 1988, and possibly historically. Climate change trends are likely to continue, and the impacts on species will likely be complicated by interactions with other factors (e.g., interactions with habitat-disturbing activities and impacts to forage resources).

There are no known roost sites in the vicinity of the Proposed Action. The closest known roosts occur in the Santa Rita Mountains, specifically on the northwestern and western slopes of this mountain range. Lesser long-nosed bats are known to travel long distances each night to forage; up to 40 miles one way. The Proposed Action falls within the foraging distance of roosts in the Santa Rita, Rincon, and Santa Catalina mountains. Therefore, there is the potential for lesser long-nosed bats to forage within the general vicinity of the Proposed Action. Foraging lesser long-nosed bats would potentially forage on various species of agave and columnar cacti, as well as hummingbird feeders within the action area.

Conclusion

The Service concurs with the FAA's determination that the Proposed Action may affect, but is not likely to adversely affect lesser long-nosed bat, based upon the following:

- There are no known roost sites within the action area; therefore, the effects to roosts from this project will be discountable.
- The Proposed Action includes measures to avoid and minimize effects to lesser long-nosed bat forage resources (saguaros). By implementing these measures, there should be no net loss of forage resources within the action area. Therefore, the effects to lesser long-nosed bat forage resources will be insignificant.
- Lighting associated with the project will be low-voltage, directional lighting. Effects to foraging lesser long-nosed bats from the proposed lighting will be insignificant.

APPENDIX F

NWP 14 Verification Letter

REC'D PCDOT FLD ENG JUN 18 '14

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
3636 N CENTRAL AVE SUITE 900
PHOENIX AZ 85012-1939

June 13, 2014

Mr. Thomas Kilargis
Pima County Department of Transportation
1313 S. Mission Road
Tucson, Arizona 85713

DEPARTMENT OF THE ARMY NATIONWIDE PERMIT VERIFICATION
(File Number: SPL-2013-00397-DB)

Dear Mr. Kilargis:

I am responding to your request (SPL-2013-00397-DB) for a Department of the Army permit. Your proposed project, Hughes Access Road Relocation, would result in a discharge of dredged and/or fill material into waters of the United States. Therefore, pursuant to section 404 of the Clean Water Act (33 U.S.C. 1344; 33 C.F.R. Parts 323 and 330), your proposed project requires a Department of the Army permit. The Hughes Access Road Relocation Project is located south of Tucson International Airport between Old Nogales Highway and Alvernon Way, in Sections 28 and 31-33, Township 15 South, Range 14 East, Tucson, Pima County, Arizona.

I have determined construction of the Hughes Access Road Relocation Project complies with Nationwide Permits (NWP) No. 14 (Linear Transportation Projects), if conducted as described in your application.

Specifically, you are authorized to conduct the following regulated activities:

1. Relocate the Hughes Access Road approximately 2,500 feet south of its existing alignment for a total length of approximately 4 miles between Old Nogales Highway and Alvernon Road. Specifically, the project includes the construction of a two-lane section of access roadway within a 150- to 170-foot-wide roadway corridor. The project is to discharge dredged and/or fill material into approximately 0.113 acre of waters of the United States, consisting of 4 ephemeral washes (Hughes Wash and 3 unnamed washes), to construct 4 cross drain structures. An additional 0.019 acre of waters of the United States would be temporarily impacted to provide construction access. All areas of temporary impact within waters of the United States shall be restored to their pre-construction contours and condition.

For this NWP verification letter to be valid, you must comply with all of the terms and conditions in Enclosure 1, as well as the following Special Conditions:

a) Prior to the commencement of any earthmoving activities associated with the project, the Permittee agrees to submit all letters of concurrence from the U.S. Fish and Wildlife Service and the State Historic Preservation Office pertaining to Endangered Species Act and National Historic Preservation Act compliance, and shall abide by all terms and conditions set forth in the concurrence documents.

b) Pursuant to 36 C.F.R. Section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall, within 24 hours, notify the State Historic Preservation Office at (602)542-7137 and the Corps at (520) 584-1677. The Permittee shall immediately suspend all work in any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps re-authorizes project construction, per 36 C.F.R. Section 800.13.

c) Prior to onset of construction/excavation, the Permittee shall provide the contractor(s) with a copy of this permit. The contractor shall read and agree to comply with all conditions herein. A copy of this permit shall be posted on site at all times during construction.

Your verification is valid through May 18, 2017. All NWPs will expire on March 18, 2017. It is incumbent upon you to remain informed of changes to the NWPs. A public notice of the change(s) will be issued when any of the NWPs are modified, reissued, or revoked. Furthermore, if you commence or are under contract to commence this activity before the date on which the relevant NWP is reissued, modified, or revoked, you will have twelve (12) months from the date of the reissuance, modification, or revocation of the NWP to complete the activity under the present terms and conditions of the relevant NWP.

A NWP does not grant any property rights or exclusive privileges. Additionally, it does not authorize any injury to the property, rights of others, nor does it authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have any questions, please contact Donald Borda at 505-342-3221 or via e-mail at Donald.Borda@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,

Donald Borden
for
Sallie Diebolt
Chief, Arizona Branch
Regulatory Division

Enclosures
1 Nationwide Permit Conditions
2 Certification of Compliance

Copy Furnished (without enclosures):

Ms. Karla Reeve-Wise
Pima County Department of Environmental Quality
33 N. Stone Avenue, Suite 700
Tucson, Arizona 85701

LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS

CERTIFICATE OF COMPLIANCE WITH DEPARTMENT OF THE ARMY NATIONWIDE PERMIT

Permit Number: *SPL-2013-00397-DB*

Name of Permittee: Pima County Department of Transportation (Thomas Kilargis); Hughes Access Road Relocation

Date of Issuance: June 13, 2014

Upon completion of the activity authorized by this permit and the mitigation required by this permit, sign this certificate, and return it to the following address:

U.S. Army Corps of Engineers, Los Angeles District
Regulatory Division, Arizona Branch
ATTN: CESPL-RG-A (SPL-2013-00397-DB)
3636 N. Central Avenue, Suite 900
Phoenix, Arizona 85012-1939

Please note that your permitted activity is subject to a compliance inspection by an Army Corps of Engineers representative. If you fail to comply with this Nationwide Permit, you may be subject to permit suspension, modification, or revocation procedures as contained in 33 C.F.R. § 330.5 or enforcement procedures such as those contained in 33 C.F.R. §§ 326.4 and 326.5.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit condition(s).

_____ _____
Signature of Permittee Date

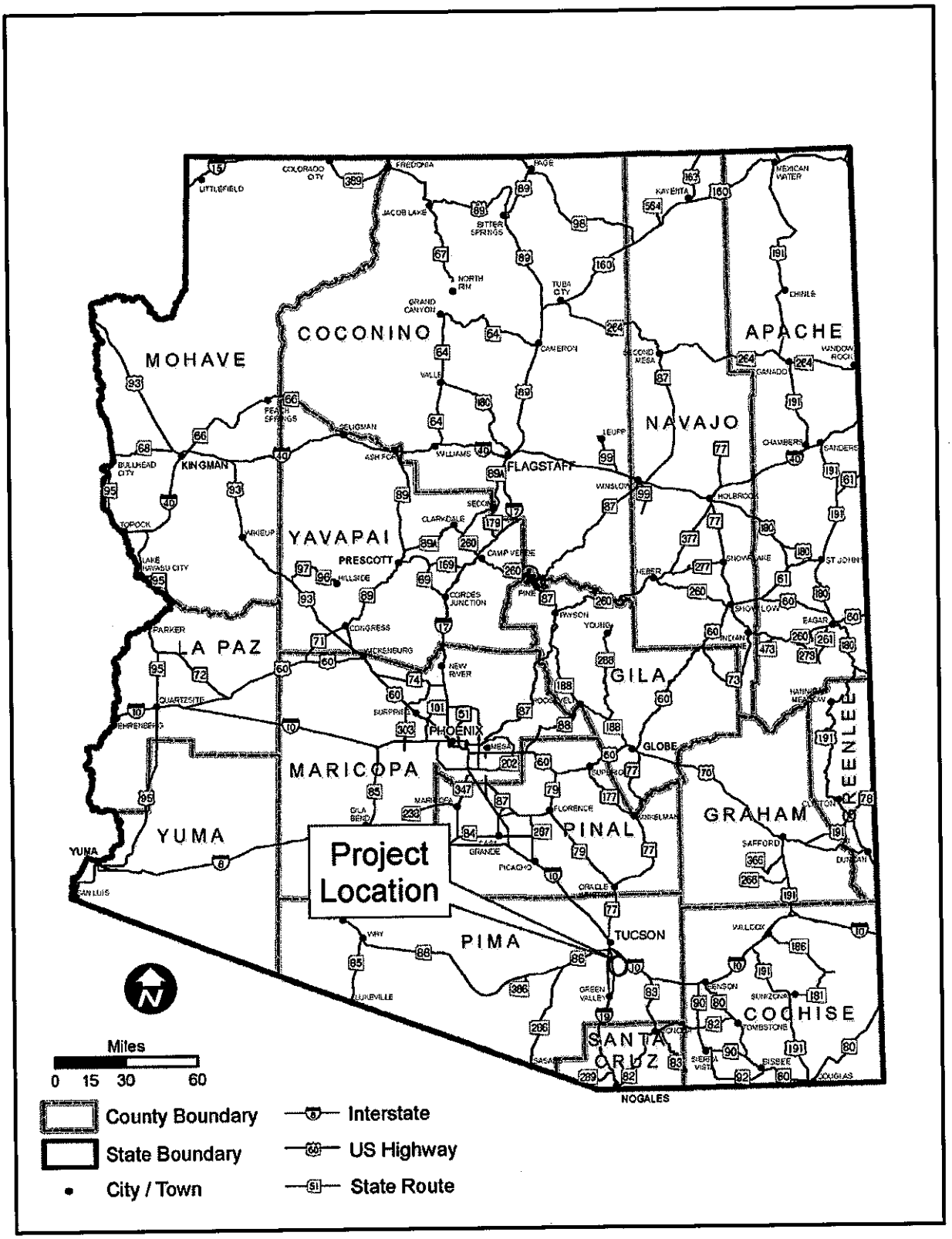

Figure 1. State location map.

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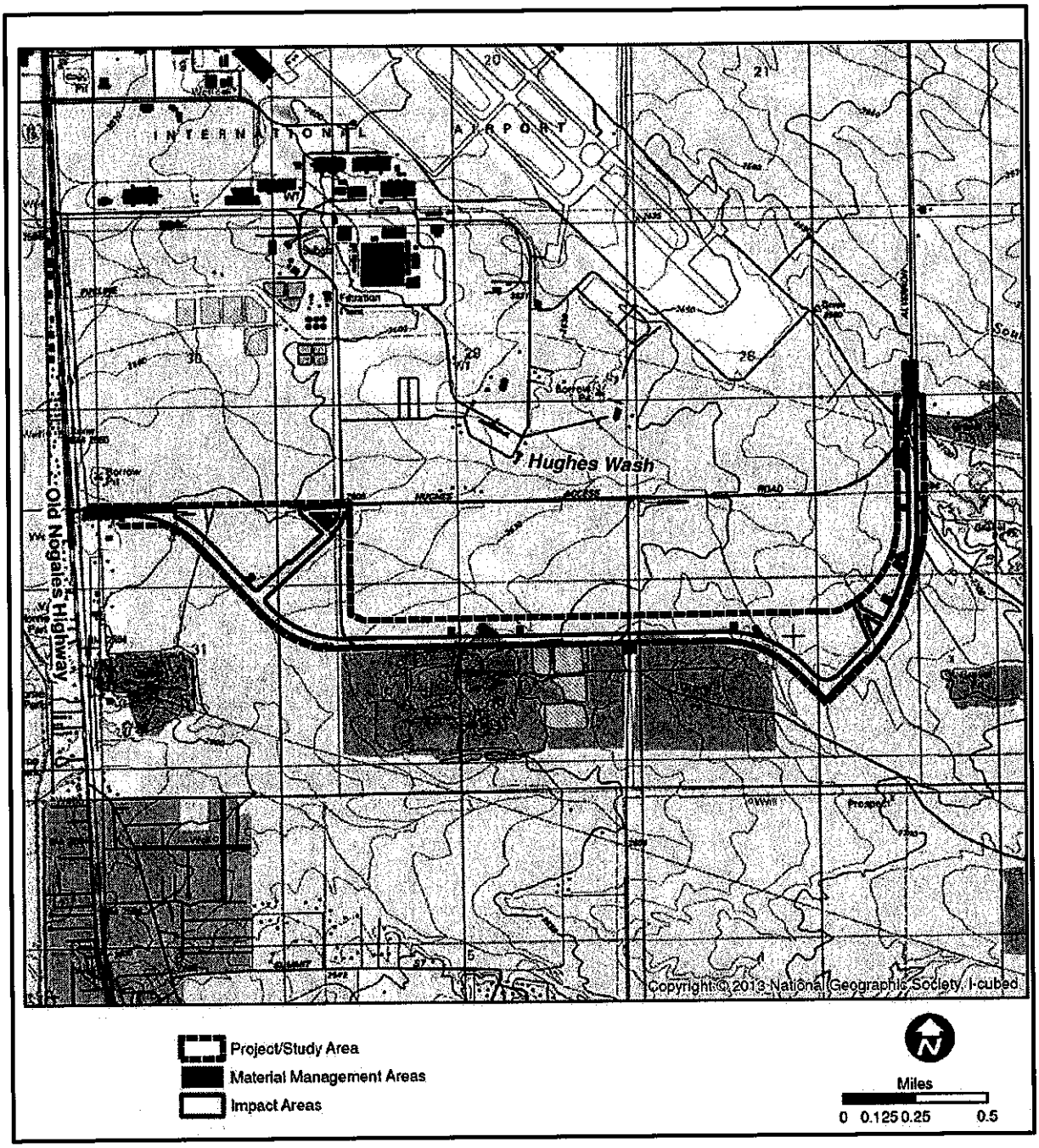

Figure 2. Project vicinity map.

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NATIONWIDE PERMIT NUMBER 14

LINEAR TRANSPORTATION PROJECTS

US Army Corps of Engineers
Los Angeles District
Regulatory Division/Arizona Branch

A. General Information

This document is an aid to understanding the terms and conditions of your nationwide permit (NWP) by bringing together information issued separately in; (1) the Federal Register (77 FR 10184-10290)*, (2) the Special Public Notice for NWP "Reissuance of the Nationwide Permits and Issuance of Final Regional Conditions for the Los Angeles District"*, and (3) the Clean Water Act Section 401 water quality certification decisions (401 WQCs)* issued by the White Mountain Apache Tribe, Hopi Tribe, Hualapai Tribe, Navajo Nation, U.S. Environmental Protection Agency, and Arizona Department of Environmental Quality. Please note that website addresses enclosed herein may have been changed and updated since publication of the original document.

1) Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and/or Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et seq) the U.S. Army Corps of Engineers (Corps) published the "Reissuance of Nationwide Permits" in the Federal Register (77 FR 10184-10290) on February 21, 2012. These NWPs are in effect from March 19, 2012 through March 18, 2017 unless modified, reissued, or revoked before that time. It is incumbent upon the permittee to remain informed of changes to the NWPs.
2) The Los Angeles District of the Corps issued a Special Public Notice (March 15, 2012) announcing final regional conditions for NWPs to ensure protection of high value waters within the State of Arizona.
3) The Los Angeles District of the Corps requested and obtained for the entire State of Arizona the 401 WQC decision for all NWPs on all tribal lands from the White Mountain Apache Tribe, Hopi Tribe, Hualapai Tribe, Navajo Nation, and U.S. Environmental Protection Agency and on all non-tribal lands from the Arizona Department of Environmental Quality.

A description of all NWPs and 401 WQCs can be found in the "Nationwide Permits for Arizona" Special Public Notice.*

*Note: For online availability see section "F. Document Availability" of this enclosure.

Key Sections: B. Nationwide Permit Terms (page 1) C. Nationwide Permit General Conditions (page 1) D. Nationwide Permit Regional Conditions (page 6) E. 401 Water Quality Certifications (page 7)

B. Nationwide Permit Terms

14. Linear Transportation Projects. Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 31.) (Sections 10 and 404)

Note: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or

more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States. (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of

the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs. (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.
(Note: Arizona endangered species information is available at http://www.fws.gov/southwest/es/arizona/Threatened.htm#CountyList)

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied. (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed. (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps. (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding

national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.
(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.
(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal: (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).
(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal. (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332. (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment. (2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered. (3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). 4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided. (5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan. (d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment. (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs. (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses. (g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management. (h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of

concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____

(Transferee)

_____

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions; (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and (c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either: (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2). (b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed project; (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans); (4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate; (5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why

compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act (c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used. (d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. (2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5. (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act. (4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

D. Nationwide Permit Regional Conditions

Of the ten regional conditions effective within the Los Angeles District of the Corps, six apply to projects within Arizona (1-4, 9 and 10). The remaining four regional conditions apply to specific geographic areas, resources, or species not located in Arizona.

The following regional conditions must be complied with for any authorization by a NWP to be valid in the State of Arizona:

Regional Condition 1: For all activities in waters of the U.S. that are suitable habitat for federally listed fish species, the permittee shall design all road crossings to ensure that the passage and/or spawning of fish is not hindered. In these areas, the permittee shall employ bridge designs that span the stream or river, including pier- or pile-supported spans, or designs that use a bottomless arch culvert with a natural stream bed, unless determined to be impracticable by the Corps.

Regional Condition 2: Nationwide Permits (NWP) 3, 7, 12-15, 17-19, 21, 23, 25, 29, 35, 36, or 39-46, 48-52 cannot be used to authorize structures, work, and/or the discharge of dredged or fill material that would result in the "loss" of wetlands, mudflats, vegetated shallows or riffle and pool complexes as defined at 40 CFR Part 230.40-45. The definition of "loss" for this regional condition is the same as the definition of "loss of waters of the United States" used for the Nationwide Permit Program. Furthermore, this regional condition applies only within the State of Arizona and within the Mojave and Sonoran (Colorado) desert regions of California. The desert regions in California are limited to four USGS Hydrologic Unit Code (HUC) accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave-181001, and Salton Sea-181002).

Regional Condition 3: When a pre-construction notification (PCN) is required, the appropriate U.S. Army Corps of Engineers (Corps) District shall be notified in accordance with General Condition 31 using either the South Pacific Division PCN Checklist or a signed application form (ENG Form 4345) with an attachment providing information on compliance with all of the General and Regional Conditions. The PCN Checklist and application form are available at: http://www.spl.usace.army.mil/Missions/Regulatory.aspx. In addition, the PCN shall include: A written statement describing how the activity has been designed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States; drawings, including plan and cross-section views, clearly depicting the location, size and dimensions of the proposed activity as well as the location of delineated waters of the U.S. on the site. The drawings shall contain a title block, legend and scale, amount (in cubic yards) and area (in acres) of fill in Corps jurisdiction, including both permanent and temporary fills/structures. The ordinary high water mark or, if tidal waters, the mean high water mark and high tide line, should be shown (in feet), based on National Geodetic Vertical Datum (NGVD) or other appropriate referenced elevation. All drawings for projects located within the boundaries of the Los Angeles District shall comply with the most current version of the Map and Drawing Standards for the Los Angeles District Regulatory Division (available on the Los Angeles District Regulatory Division website at: http://www.spl.usace.army.mil/Missions/Regulatory.aspx); and numbered and dated pre-project color photographs showing a representative sample of waters proposed to be impacted on the project site, and all waters proposed to be avoided on and immediately adjacent to the project site. The compass angle and position of each photograph shall be documented on the plan-view drawing required in subpart b of this regional condition.

Regional Condition 4: Submission of a PCN pursuant to General Condition 31 and Regional Condition 3 shall be required for all regulated activities in the following locations: a) All perennial waterbodies and special aquatic sites within the State of Arizona and within the Mojave and Sonoran (Colorado) desert regions of California, excluding the Colorado River in Arizona from Davis Dam to River Mile 261 (northern boundary of the Fort Mojave Indian Tribe Reservation). The desert region in California is limited to four USGS HUC accounting units (Lower Colorado -150301, Northern Mojave-180902, Southern Mojave-181001, and Salton Sea-181002). b) All areas designated as Essential Fish Habitat (EFH) by the Pacific Fishery Management Council (i.e., all tidally influenced areas - Federal Register dated March 12, 2007 (72 FR 11092)), in which case the PCN shall include an EFH assessment and extent of proposed impacts to EFH. Examples of EFH habitat assessments can be found at: http://www.swr.noaa.gov/efh.htm. c) All watersheds in the Santa Monica Mountains in Los Angeles and Ventura counties bounded by Calleguas Creek on the west, by Highway 101 on the north and east, and by Sunset Boulevard and Pacific Ocean on the south. d) The Santa Clara River watershed in Los Angeles and Ventura counties, including but not limited to Aliso Canyon, Agua Dulce Canyon, Sand Canyon, Bouquet Canyon, Mint Canyon, South Fork of the Santa Clara River, San Francisquito Canyon, Castaic Creek, Piru Creek, Sespe Creek and the main-stem of the Santa Clara River.

Regional Condition 9: Any requests to waive the 300 linear foot limitation for intermittent and ephemeral streams for NWPs 29, 39, 40 and 42, 43, 44, 51 and 52 or to waive the 500 linear foot limitation along the bank for NWP 13, must include the following: a) A narrative description of the stream. This should include known information on: volume and duration of flow; the approximate length, width, and depth of the waterbody and characters observed associated with an Ordinary High Water Mark (e.g. bed and bank, wrack line, or scour marks); a description of the adjacent vegetation community and a statement regarding the wetland status of the associated vegetation community (i.e. wetland, non-wetland); surrounding land use; water quality; issues related to cumulative impacts in the watershed, and; any other relevant information. b) An analysis of the proposed impacts to the waterbody in accordance with General Condition 31 and Regional Condition 3; c) Measures taken to avoid and minimize losses, including other methods of constructing the proposed project; and d) A compensatory mitigation plan describing how the unavoidable losses are proposed to be compensated, in accordance with 33 CFR Part 332.

Regional Condition 10: The permittee shall complete the construction of any compensatory mitigation required by special condition(s) of the NWP verification before or concurrent with commencement of construction of the authorized activity, except when specifically determined to be impracticable by the Corps. When mitigation involves use of a mitigation bank or in-lieu fee program, the permittee shall submit proof of payment to the Corps prior to commencement of construction of the authorized activity.

E. 401 Water Quality Certification (401 WQC)

A 401 WQC is mandatory for any activity that requires a Clean Water Act Section 404 permit. A 401 WQC is required prior to discharging any dredged or fill material into a water of the United States. Only one of the following 401 WQCs listed below will apply to your project. The geographical location of your project will determine which 401 WQC is applicable. The 401 WQCs issued for this NWP will remain in effect through March 18, 2017.

On all "Non-Tribal Lands", lands that are not part of federally recognized Indian Reservation, the Arizona Department of Environmental Quality (ADEQ) is the agency responsible for issuing the 401 WQC.

On all "Tribal Lands", lands that are part of a federally recognized Indian Reservation, the U.S. Environmental Protection Agency (EPA) is responsible for issuing the 401 WQC except where EPA has delegated the 401 WQC authority to the White Mountain Apache Tribe (Fort Apache Indian Reservation), Hopi Tribe (Hopi Indian Reservation), Hualapai Tribe (Hualapai Indian Reservation), or Navajo Nation (Navajo Indian Reservation).

If "Individual Certification" is required you must apply for, receive, and comply with the 401 WQC issued by ADEQ, EPA, or the appropriate Tribe.

Non-tribal Lands - 401 WQCs

The 401 WQCs issued by ADEQ are summarized in Table 1. For projects that can be conditionally certified the project must comply with all of the applicable ADEQ 401 General Conditions that follow Table 1.

Tribal Lands - 401 WQCs

Fort Apache Indian Reservation (White Mountain Apache Tribe):	Individual Certification required for all projects.*
Hopi Indian Reservation (Hopi Tribe):	Individual Certification required for all projects.*
Hualapai Indian Reservation (Hualapai Tribe):	Individual Certification required for all projects.*
Navajo Indian Reservation (Navajo Nation):	Individual Certification required for all projects.*
All other Indian Reservations (EPA):	401 WQCs issued by EPA are summarized in Table 2. EPA's General and Permit-Specific Conditions follow Table 2.*

*Note: For online availability see section "F. Document Availability" of this enclosure.

401 WQC Contact Information

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Robert Scalamera
Surface Water Section, 401 Certifications
Arizona Department of Environmental Quality
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Telephone: 602-771-4502
Fax: Not available
E-mail: rs3@azdeq.gov

F. Document Availability

Reissuance of Nationwide Permits, 77 FR 10184-10290	http://www.gpo.gov/fdsys/pkg/FR-2012-02-21/pdf/2012-3687.pdf
Special Public Notice for Regional Conditions	Contact Corps project manager for copy of document.
EPA 401 WQC for NWPs	Contact Corps project manager for copy of document.
White Mountain Apache Tribe 401 WQC for NWPs	Contact Corps project manager for copy of document.
Hopi Tribe 401 WQC for NWPs	Contact Corps project manager for copy of document.
Havasupai Tribe 401 WQC for NWPs	Contact Corps project manager for copy of document.
Navajo Nation 401 WQC for NWPs	Contact Corps project manager for copy of document.
ADEQ 401 WQC for NWPs	Contact Corps project manager for copy of document.

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Table 1 - ADEQ 401 WQCs for all Non-Tribal Lands

NWP	303(d) impaired waters [1] & Tributaries to 303[d]-impaired waters[2]	OAW[3] & Tributaries to OAW	Lakes[4]	Other Waters[5]	Comments
1 - Aids to Navigation	-	-	-	-	N/A
2 - Structures in Artificial Canals	-	-	-	-	N/A
3 - Maintenance	I	I	I	C	
4 - Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities	I	I	I	C	
5 - Scientific Measurement Devices	I	I	I	C	
6 - Survey Activities	I	I	I	C	
7 - Outfall Structures and Associated Intake Structures	I	I	I	C	
8 - Oil and Gas Structures on the Outer Continental Shelf	-	-	-	-	N/A
9 - Structures in Fleeting and Anchorage Areas	-	-	-	-	N/A
10 - Mooring Buoys	-	-	-	-	N/A
11 - Temporary Recreational Structures	-	-	-	-	N/A
12 - Utility Line Activities	I	I	I	C	
13 - Bank Stabilization	I	I	I	C	
14 - Linear Transportation Projects	I	I	I	C	
15 - U.S. Coast Guard Approved Bridges	I	I	I	C	
16 - Return Water From Upland Contained Disposal Areas	I	I	I	C	
17 - Hydropower Projects	I	I	I	C	
18 - Minor Discharges	I	I	I	C	
19 - Minor Dredging	I	I	I	C	
20 - Response Operations for Oil and Hazardous Substances	I	I	I	T	If work begins within 14 days of event.
21 - Surface Coal Mining Activities	I	I	I	I	
22 - Removal of Vessels	I	I	I	C	
23 - Approved Categorical Exclusion	I	I	I	C	
24 - Indian Tribe or State Administered Section 404 Programs	-	-	-	-	N/A
25 - Structural Discharges	I	I	I	C	
26 - [Reserved]	-	-	-	-	
27 - Aquatic Habitat Restoration, Establishment, and Enhancement Activities	I	I	I	I	
28 - Modifications of Existing Marinas	-	-	-	-	N/A
29 - Residential Developments	I	I	I	C	
30 - Moist Soil Management for Wildlife	I	I	I	C	
31 - Maintenance of Existing Flood Control Facilities	I	I	I	C	
32 - Completed Enforcement Actions	I	I	I	C	
33 - Temporary Construction, Access, and Dewatering	I	I	I	C	
34 - Cranberry Production Activities	I	I	I	I	
35 - Maintenance Dredging of Existing Basins	I	I	I	C	
36 - Boat Ramps	I	I	I	C	
37 - Emergency Watershed Protection and Rehabilitation	I	I	I	T	If work begins within 30 days of event.
38 - Cleanup of Hazardous and Toxic Waste	I	I	I	T	If work begins within 2 days of discovery.
39 - Commercial and Institutional Developments	I	I	I	C	
40 - Agricultural Activities	I	I	I	C	
41 - Reshaping Existing Drainage Ditches	I	I	I	C	
42 - Recreational Facilities	I	I	I	C	
43 - Stormwater Management Facilities	I	I	I	C	
44 - Mining Activities	I	I	I	I	
45 - Repair of Uplands Damaged by Discrete Events	I	I	I	T	If work begins within 14 days of event.
46 - Discharges in Ditches	I	I	I	C	
47 - [Reserved]	-	-	-	-	Reserved
48 - Commercial Shellfish Aquaculture Activities	I	I	I	C	
49 - Coal Remining Activities	I	I	I	I	
50 - Underground Coal Mining Activities	I	I	I	I	
51 - Land-Based Renewable Energy Generation Facilities	I	I	I	C	
52 - Water-Based Renewable Energy Generation Pilot Projects	I	I	I	C	

C = Conditionally certified in Other waters, all applicable CWA 401 General Conditions listed on following pages apply.
T = Conditionally certified only if work begins within designated time of event, otherwise individual 401 certification required.
I = Individual certification required. N/A = Not Available/Not Applicable.

[1] 303[d]-listed Impaired Waters list available at http://www.azdeq.gov/index.html. For projects on an impaired surface water, if the project is within 1600 meters (or 1 mile) upstream and/or 800 meters (½ mile) downstream of an impaired surface water.

[2] Tributaries to 303[d]-impaired waters. For projects on a tributary to an impaired surface water, or if the tributary mouth is to an impaired surface water and the project is within 1600 meters (or 1 mile) of its mouth.

[3] Outstanding Arizona Waters (OAW) are the surface waters of exceptional quality listed at http://www.azdeq.gov/index.html. For projects on a designated Outstanding Arizona Water OAW, if the project is within 1600 meters (or 1 mile) upstream and/or 800 meters (½ mile) downstream of a designated OAW. Also, Tributaries to Outstanding Arizona Waters: For projects on a tributary to a designated Outstanding Arizona Water, or if the tributary mouth is to an impaired surface water and the project is within 1600 meters (or 1 mile) of its mouth.

[4] Lakes are lakes and reservoirs listed at http://www.azdeq.gov/index.html

[5] Other Waters are all WUS that are not otherwise designated as a 303(d) Impaired, OAW, or a lake.

ADEQ 401 General Conditions applicable to Other Waters of the United States (WUS) on all Non-Tribal Lands

1) Any discharge occurring as a result of activities certified for the subject project shall not cause an exceedence of any Water Quality Standard (WQS). Applicability of this condition is as defined in A.A.C. R18-11-102.
2) This certification does not authorize the discharge of wastewater, process residues or other waste to any WUS.
3) Work shall be conducted and monitored to ensure that pollution from the activities certified herein does not cause an exceedence of Arizona WQS in any WUS.
4) Activities herein certified shall be performed during periods of low flow (baseflow or less) in any WUS, or no flow in the case of ephemeral and intermittent WUS. No work shall be done, nor shall any equipment or vehicles enter any WUS while flow is present, unless all applicable conditions in this certification are met.
5) The effectiveness of all pollution control measures, including erosion and sedimentation, shall be reevaluated after each flow event and repaired/modified as needed.
6) Applicant must minimize clearing, grubbing, scraping or otherwise limit exposure of erodible surface to the minimum necessary for each construction phase or location.
7) If activities certified herein are likely to cause or contribute to an exceedence of WQS, or create an impediment to the passage of fish or other aquatic life - operations shall cease until the problem is resolved or until control measures have been undertaken.
8) Erosion control, sediment control and/or bank protection measures shall be installed before construction and pre-operation activities, and shall be maintained during construction and post-construction periods to minimize channel or bank erosion, soil loss and sedimentation. Control measures shall not be constructed of uncemented or unconfined imported soil, or other materials easily transported by flow.
9) For portions of the project utilizing potable water or groundwater for irrigation or dust control, direct runoff of such water shall be limited to the extent practicable and shall not cause downstream erosion or flooding.
10) The applicant is responsible for ensuring construction material and/or fill (other than native fill or that necessary to support revegetation) placed in any WUS, shall not include materials that can cause or contribute to pollution of the WUS. Examples of prohibited fill include pollutant-contaminated soil and materials defined as pollutants or hazardous in Arizona Revised Statutes (A.R.S.) § 49-201. Fill used to support vegetation rooting or growth shall be protected from erosion.
11) Any washing of fill material must occur outside of any WUS prior to placement and the rinseate from such washing shall be settled, filtered or otherwise treated to prevent migration of pollutants (including sediment) or from causing erosion to any WUS. Other than replacement of native fill or material used to support vegetation rooting or growth, fill placed in locations subject to scour must resist washout whether such resistance is derived via particle size limits, presence of a binder, vegetation, or other armoring.
12) Any dredged material or waste material is to be placed and retained in areas outside any WUS. Runoff from this material/area is to be settled, filtered or otherwise treated to prevent migration of pollutants (including sediment) to any WUS.
13) Acceptable construction materials that will or may contact water in any WUS are: untreated logs and lumber, crushed stone, crushed clean concrete (recycled concrete), native fill, precast, sprayed or cast-in-place concrete (including soil cement and unmodified grouts), steel (including galvanized), plastic and aluminum. Use of other materials may be allowed, but require application for an individual 401 certification.
14) Upon completion of construction the applicant shall ensure no adverse change, due to the subject project, has occurred in the stability with respect to stream hydraulics, erosion and sedimentation, of any WUS including upstream and downstream from the project. If such change has occurred, the applicant shall take steps to restore the pre-project stability of any impacted segments.
15) Except where the activities certified herein are intended to permanently alter any WUS, all disturbed areas shall be restored and (re)vegetated as soon as physically practicable. Vegetation shall be maintained on unarmored banks and slopes to stabilize soil and prevent erosion.
16) If retention/detention basins are included in the project, applicant will complete the grading necessary to direct runoff towards retention/detention basins no later than immediately following initial land clearing or rough grading. Retention/detention basins shall be sized to accept storm runoff and capture sediment prior to it entering or moving downstream in any WUS. Detention basins will provide detention by controlling outflow and shall cause no significant change to the hydraulic conditions of the upstream or downstream WUS outside of the project boundaries. The basins shall be maintained; e.g., have sediment removed, as required to maintain their function.
17) Unless specifically permitted to do so when flow is present in any WUS within the project area, the applicant and any contractor will not alter the flow by any means except to prevent erosion or pollution of any WUS.
18) Silt laden or turbid water resulting from activities certified herein shall be settled, filtered or otherwise treated to ensure no violation of Arizona WQS in any WUS.
19) When flow in any WUS in the work area is sufficient to erode, carry or deposit material, activities certified herein shall cease until:
The flow decreases below the point where sediment movement ceases, or control measures have been undertaken; e.g., equipment and materials easily transported by flow are protected with non-erodible barriers or moved outside the flow area.
20) The applicant will erect any barriers, covers, shields and other protective devices as necessary to prevent any construction materials, equipment or contaminants/pollutants from falling, being thrown or otherwise entering any WUS.
21) The applicant must designate area(s) for equipment staging and storage located entirely outside of any WUS. In addition, the applicant must designate areas, located entirely outside of any WUS, for fuel, oil and other petroleum product storage and for solid waste containment. All precautions shall be taken to avoid the release of wastes, fuel or other pollutants to any WUS. Any equipment maintenance, washing or fueling that cannot be done offsite will be performed in the designated area with the following exception: equipment too large or unwieldy to be readily moved; e.g., large cranes, may be fueled and serviced in the WUS (but outside of standing or flowing water) as long as material specifically manufactured and sold as spill containment is in place during fueling/servicing. All equipment shall be inspected for leaks, all leaks shall be repaired and all repaired equipment will be cleaned to remove any fuel or other fluid residue prior to use within (including crossing) any WUS. The applicant shall have a spill containment plan onsite to ensure that pollutants are prevented from entering any WUS. Any pollutant generated by activities certified herein shall be properly disposed of in accordance with applicable regulations. A spill response kit will be maintained in this (these) area(s) to mitigate any spills. The kit will include material specifically manufactured and sold as spill adsorbent/absorbent and spill containment. The applicant will ensure that whenever there is activity on the site, that there are personnel on site trained in the proper response to spills and the use of spill response equipment.
22) Permanent and temporary pipes and culverted crossings shall be adequately sized to handle expected flow and properly set with end section, splash pads, or headwalls that dissipate water energy to control erosion.

23) All temporary structures, within any WUS, constructed of imported materials and all permanent structures within any WUS, including but not limited to, access roadways; culverted and unculverted crossings; staging areas; material stockpiles; berms, dikes and pads, shall be constructed so as to accommodate overtopping and must resist washout of the feature by streamflow.
24) Any temporary crossing, other than fords on native material, shall be constructed in such a manner so as to provide armoring of the stream channel. Materials used to provide this armoring shall not include anything easily transportable by flow. Examples of acceptable materials include steel plates, wooden planks, pre-cast concrete planks or blocks; examples of unacceptable materials include clay, silt, sand and gravel finer than cobble (roughly fist-sized). The armoring must, via mass, anchoring systems or a combination of the two, resist washout. Any ford shall be designed, and maintained as necessary, to carry the proposed traffic without causing erosion or sedimentation of the stream channel while dry or during a flow event equal to or less than the crossing's design event; i.e., the flow event which closes the ford to traffic. No unarmored ford shall be subject to heavy-truck or equipment traffic after a flow event until the stream bed is dry enough to support the traffic without disturbing streambed material to a greater extent than in dry conditions. Light vehicles (less than 14,000 pounds gross weight) are not restricted by this condition. Applicant will take measures necessary to prevent approaches to any WUS crossing from causing erosion or contributing sediment to any WUS.
25) Temporary structures constructed of imported materials are to be removed no later than upon completion of the permitted activity.
26) Temporary structures constructed of native materials, if they provide an obstacle to flow or can contribute to or cause sedimentation or erosion, are to be removed no later than upon completion of the permitted activity.
27) Upon completion of the activities certified herein (except as noted in condition 28 -concrete curing), areas within any WUS shall be promptly cleared of all forms, piling, construction residues, equipment, debris or other obstructions.
28) If fully, partially or occasionally submerged structures are constructed of cast-in-place concrete instead of pre-cast concrete, applicant will take steps; e.g., sheet piling or temporary dams, to prevent contact between water (instream and runoff) and the concrete until it cures and until any curing agents have evaporated or otherwise cease to be available; i.e., are no longer a pollutant threat. Where practicable, construction work will be during extreme low water conditions or at a time and season with the highest probability of ensuring work is done in "the dry".
29) Any permanent WUS crossings other than fords, shall not be equipped with gutters, drains, scuppers or other conveyances that allow untreated runoff (due to events equal to or lesser in magnitude than the design event for the crossing structure) to directly enter a WUS if such runoff can be directed to a local stormwater drainage, containment and/or treatment system.
30) Applicant will clear debris as needed from culverts, ditches, dips and other drainage structures in any WUS to prevent clogging or conditions that may lead to washout.

Table 2 - EPA 401 WQC for Tribal Lands (All Indian Reservations except Fort Apache, Hopi, Hualapai and Navajo Indian Reservations)

NWP	Conditional Certification		Notification	Impact Limits	Notes
	General Conditions	Specific Conditions			
1 - Aids to Navigation	X		MPCN	None	
2 - Structures in Artificial Canals	X		MPCN	None	
3 – Maintenance	X	X	PCN or MPCN	Generally no increase in fill footprint	1,2
4 - Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities	X		MPCN	None	
5 - Scientific Measurement Devices	X		MPCN	25 cyds	
6 - Survey Activities	X		MPCN	25 cyds	
7 - Outfall Structures and Associated Intake Structures	X		PCN	None	
8 - Oil and Gas Structures on the Outer Continental Shelf	X		PCN	None	
9 - Structures in Fleeting and Anchorage Areas	X		MPCN	None	
10 - Mooring Buoys	X		MPCN	None	
11 - Temporary Recreational Structures	X		MPCN	None	
12 - Utility Line Activities	X	X	PCN or MPCN	**½ acre or 300'	3,4
13 - Bank Stabilization	X	X	PCN or MPCN	**½ acre or 300'	5
14 - Linear Transportation Projects	X	X	PCN or MPCN	**½ acre or 300' nontidal, ⅓ acre or 300' tidal	3
15 - U.S. Coast Guard Approved Bridges	X		MPCN	None	
16 - Return Water From Upland Contained Disposal Areas	X		MPCN	None	
17 - Hydropower Projects	X		PCN	None	
18 - Minor Discharges	X		PCN or MPCN	1/10 acre or 25 cyds	
19 - Minor Dredging	X		MPCN	25 cyds	
20 - Response Operations for Oil and Hazardous Substances	X		MPCN	None	
21 - Surface Coal Mining Activities	X	X	PCN	½ acre or 300'	6
22 - Removal of Vessels	X		PCN or MPCN	None	
23 - Approved Categorical Exclusion	X		PCN or MPCN	None	
24 - Indian Tribe or State Administered Section 404 Programs	X		MPCN	None	
25 - Structural Discharges	X		MPCN	None	
26 - [Reserved]					
27 - Aquatic Habitat Restoration, Establishment, and Enhancement Activities	X	X	PCN or MPCN	None	7
28 - Modifications of Existing Marinas	X		MPCN	None	
29 - Residential Developments	X	X	PCN or MPCN	**¼ acres for single house, ½ acres or 300' for multi-unit	8, 9
30 - Moist Soil Management for Wildlife	X		MPCN	None	
31 - Maintenance of Existing Flood Control Facilities	X	X	PCN	None	10
32 - Completed Enforcement Actions	X		MPCN	5 acres non-tidal or 1 acre tidal	
33 - Temporary Construction, Access, and Dewatering	X		PCN	None	
34 - Cranberry Production Activities	X		PCN	10 acres	
35 - Maintenance Dredging of Existing Basins	X		MPCN	Lesser of previously authorized or controlling depths	
36 - Boat Ramps	X		PCN or MPCN	50 cyds, 20'-wide ramp	8
37 - Emergency Watershed Protection and Rehabilitation	X		PCN or MPCN	None	
38 - Cleanup of Hazardous and Toxic Waste	X		PCN	None	
39 - Commercial and Institutional Developments	X	X	PCN or MPCN	½ acre or 300' non-tidal	8
40 - Agricultural Activities	X	X	PCN or MPCN	½ acre or 300' non-tidal	8
41 - Reshaping Existing Drainage Ditches	X	X	PCN or MPCN	**½ acre or 300' non-tidal	8
42 - Recreational Facilities	X	X	PCN	½ acre or 300' non-tidal	
43 - Stormwater Management Facilities	Individual Certification Required		MPCN	Not Applicable	
44 - Mining Activities	X	X	PCN or MPCN	½ acre or 300' non-tidal	8
45 - Repair of Uplands Damaged by Discrete Events	X	X	PCN or MPCN	**½ acre or 300'	8
46 - Discharges in Ditches	X	X	PCN or MPCN	**½ acre or 300' non-tidal	8
47 - [Reserved]					
48 - Commercial Shellfish Aquaculture Activities	X	X	PCN or MPCN	**Impacts of submerged aquatic veg. prohibited	
49 - Coal Remining Activities	X	X	PCN or MPCN	**½ acre or 300' non-tidal	8
50 - Underground Coal Mining Activities	X	X	PCN or MPCN	½ acre or 300' non-tidal	8
51 - Land-Based Renewable Energy Generation Facilities	X	X	PCN or MPCN	½ acre or 300' non-tidal	8
52 - Water-Based Renewable Energy Generation Pilot Projects	X	X	PCN or MPCN	½ acre or 300'	

X=Conditional Certification requires compliance with General and Specific Conditions on following pages.
MPCN=Modified Pre-Construction (MPCN) must be submitted to EPA even though Corps notification is not required.
PCN=Pre-Construction Notification (PCN) submitted to Corps must also be submitted to EPA.
** Impacts limits are modified by EPA

Notes:
1. No undersized structures
2. Bioengineering used whenever practicable
3. Only once per single and complete project with independent utility
4. Waiver approval required from EPA for 300"
5. Waiver approval required from EPA
6. EPA approves mitigation plan first
7. Approval required from EPA
8. Waiver approval required from EPA
9. No recreational impacts authorized
10. Approval for levee vegetation removal required from EPA

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EPA 401 WQC General and Specific Nationwide Permit Conditions for Tribal Lands
(All Indian Reservations except Fort Apache, Hopi, Hualapai and Navajo Indian Reservations)
General Conditions

Projects that are unable to comply with the general conditions of this programmatic certification are denied certification without prejudice and the applicant must apply to EPA for an individual certification. Applicants can apply for an individual certification by providing the same content required in a MPCN described in General Condition 01. *Notification*, of this programmatic certification, but EPA may request additional project information for individual certifications after receiving notification materials. When an individual certification is required, EPA will strive to issue, deny, or waive certification within sixty days of receipt of complete project information, but our review shall not exceed one year, the statutory limit beyond which certification is considered waived.[1]

01. Notification - To improve the government's ability to demonstrate whether the NWP program has minimal adverse impacts to the aquatic environment, individually and cumulatively, all NWP-authorized projects proceeding on tribal lands within Region 9 shall submit a form of notification to EPA Region 9 as described below.[2] Notification is required in order to be eligible for any NWP under this certification.

Projects seeking authorization under this certification will fall under one of the following two notification categories:

Pre-Construction Notification (PCN):

The Corps already requires a PCN, subject to criteria in the Corps' General Condition 31, because the project proposes use of a NWP that requires a PCN automatically or for specific activities authorized by the NWP. Applicants must simply forward a second copy of the PCN already required by the Corps to EPA Region 9 for notification. If a PCN is already required by the Corps and a waiver of impact limits is proposed beyond what is approved under this certification, applicants must include written determinations specified in General Condition 02. *Waivers* for EPA approval.

Modified Pre-Construction Notification (MPCN):

a)The Corps does not require a PCN for any activities authorized under the NWP proposed for use, or for impacts below limits identified in the NWP for a PCN. Applicants must forward a MPCN to EPA Region 9 for notification, subject to the criteria below. If a waiver of impact limits is proposed beyond what is approved under this certification, applicants must include written determinations specified in General Condition 02. *Waivers* for EPA approval. 1)***Timing.*** Applicants shall submit an MPCN to EPA Region 9 as early as possible, and in advance of any authorization letter from the Corps allowing the applicant to proceed under a given NWP. When an EPA approval is required by condition of this certification, EPA will act within sixty days of receiving a complete MPCN. 2)***Content.*** MPCNs must be in writing (electronic mail submittal is acceptable) and include the following information: a) Name, address and telephone numbers of the applicant and any agents or representatives. If available, the electronic mail address and fax numbers for these persons; b) Location of the proposed project; c) A description of the proposed project and impacts including i)the project's purpose; ii) direct and indirect adverse environmental effects the project would cause, including the proposed acreages and linear feet (for streams) of waters impacted, avoided, and where applicable, created or otherwise mitigated; iii) any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to determine compliance with NWP and EPA 401 conditions and to determine whether compensatory mitigation may be necessary. Maps, drawings and/or photographs of the project area and aquatic resources are not mandatory, but usually help to clarify the project and allow for quicker review. At minimum, a narrative description of any special aquatic sites and other waters of the United States on the project site must be included; b) Consistent with General Condition 02. *Waivers*, a written demonstration that any proposed impact limit waiver that may be allowable under this certification will result in minimal impacts to aquatic resource functions; c) Consistent with General Condition 03. *Avoidance, Minimization, and Mitigation*, a written statement documenting measures taken to avoid and minimize temporary and permanent impacts to waters of the U.S.; d) Consistent with General Condition 04. *Prohibition on the Multiple Use of One NWP for a Single Project*, for proposed utility or transportation projects where the same NWP is proposed at multiple locations, a written determination will be provided describing independent utility of each impact location and how the project will not contribute to more than minimal direct, indirect and cumulative impacts to waters of the U.S., either at the impact site or to upstream, downstream, or adjacent aquatic resources. e) The name(s) of any species listed as endangered or threatened under the Endangered Species Act which may be adversely affected by the proposed work, either directly or by impacting designated critical habitat; f) Identification of any cultural or historic properties listed in, or eligible for listing in, the National Register of Historic Places that may be adversely affected by the proposed work. Written notification should be mailed to USEPA Region 9, WTR-8, 75 Hawthorne Street, San Francisco, CA 94105.

02. Waivers - For certain NWPs, Corps District Engineers may waive impact thresholds for intermittent and ephemeral drainages by making a written determination that the discharge will result in minimal adverse effects. To ensure that these waters, commonly found on tribal lands in the arid southwest, receive an adequate level of protection, and to prevent the NWP Program from having more than minimal adverse impacts to the aquatic environment, all proposed impact limit waivers are denied under this certification unless EPA approves a written determination that the waiver will not exceed minimal impacts to aquatic resource functions. For some NWPs where the Corps does not include an impact limit, EPA has added an impact limit as a permit-specific condition. Some of these NWPs also include a condition that a waiver may be provided when EPA approves a written determination that the waiver will not exceed minimal impacts to aquatic resource functions. Impacts to special aquatic sites are not permitted under this certification unless EPA approves a written determination that impacts to aquatic resource functions will be minimal. "Special aquatic sites" include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs and riffle pool complexes. When EPA approval is required for a waiver, EPA will act within sixty days of receiving a complete PCN or MPCN.

03. Avoidance, Minimization, and Mitigation - To protect water quality and beneficial uses of U.S. waters on tribal lands, all projects using NWPs must avoid discharges to the maximum extent practicable, and utilize the best available and practicable means of minimizing the adverse impact of discharges that cannot be avoided. A written statement documenting measures taken to avoid and minimize temporary and permanent impacts to waters of the U.S. will be provided to EPA and the Corps with each PCN or MPCN. To the extent practicable, temporary impact sites will be returned to pre-construction contours and substrate. Where applicable, banks shall be reseeded or replanted with native vegetation. EPA shall make a written determination, within sixty days of receipt of a complete PCN or MPCN, whether compensatory mitigation measures are required to ensure the activity will have only minimal adverse effects, but no such determination is required for a project to begin work if otherwise in compliance with the NWP, this programmatic certification, and any applicable tribal or local authorities' requirements. Nevertheless, should compensatory mitigation be determined necessary by EPA, the mitigation becomes a condition of water quality certification and thus a condition of the Corps' permit. Failure to address an EPA mitigation requirement would therefore place a permittee out of compliance with their NWP and potentially subject to a range of

[1] Clean Water Act Section 401 Certification (a): http://water.epa.gov/lawsregs/guidance/wetlands/sec401.cfm

[2] NOTE: this requirement does not modify or eliminate existing Corps requirements regarding PCNs for projects proceeding on tribal lands (or elsewhere).

Corps and EPA enforcement actions. The need for post-project performance and/or mitigation monitoring and reporting (if applicable) will be determined by EPA on a case-by-case basis.

04. Prohibition on the Multiple Use of One NWP for a Single Project - Permittees may not use the same NWP multiple times (more than once) for one single and complete project at locations that do not have independent utility; to do so circumvents acreage limitations of the NWPs and may result in more than minimal adverse impacts to water quality and other ecosystem services. For example, under this certification, linear transportation projects on tribal lands must sum the impacts of each proposed crossing of individual waters of the U.S. and use that total to determine eligibility for NWP 14 (Linear Transportation Projects). If the acreage or linear foot impacts exceed the limits of the applicable NWP (or combination of applicable *different* NWPs), minimal adverse impacts to water quality may be exceeded and the project is not eligible for 401 certification under this programmatic action. Under these circumstances, projects must seek individual certification from EPA, and EPA may grant, grant with conditions, waive, or deny 401 certification of the project under the NWP. In the event of a denial, the NWP would not be available to the project proponent and therefore applicants may need to apply to the Corps for authorization under a different General Permit, Letter of Permission, or Individual Permit as appropriate and determined by the Corps. EPA would review these other proposed permit actions for case-by-case certification. Note that, on a case-by-case basis, EPA may waive this General Condition and allow the use of multiple NWPs if the applicant so appeals, and demonstrates in their PCN or MPCN that authorization under the NWP will result in minimal and/or completely mitigated impacts to the aquatic environment, individually and cumulatively.

05. Use of Appropriate Fill Material - To the extent practicable, local, native materials should be used as fill material. (*e.g.*, soil, sand, or rock from the site or near the site; clean building materials or clean imported earthen fill). Inappropriate and unauthorized fill materials include, but are not limited to: tires, junked or abandoned vehicles, appliances, or other equipment; garbage; debris; oil drums or other chemically contaminated vessels; artificial turf; non-native vegetation; etc. If an applicant has any doubts or questions about the suitability of a proposed fill material, they should consult with the Corps and/or EPA prior to discharging into waters of the U.S. Such consultation may be via phone, or written letter, fax or electronic mail.

06. Dewatered Conditions - Discharges below the ordinary high water mark or within jurisdictional wetlands are not approved under this certification unless the discharge site is naturally dewatered (*e.g.,* seasonally dry), or dewatering has been authorized by the Corps, thereby avoiding direct discharge of pollutants into the water column. If the site is artificially dewatered, permittees shall, to the extent practicable, avoid dewatering techniques that require additional temporary or permanent discharges of fill material within jurisdictional waters (*e.g.*, coffer dams).

07. Fills Within Floodplains - Projects requiring NWP authorization for discharges of fill material within 100-year floodplains shall include in their PCN or MPCN a statement of compliance with Executive Order 11988 (Floodplain Management). However, discharges within the FEMA-mapped 100-year floodplain associated with residential and commercial development are not certified for use under the NWP program on tribal lands. The 100-year floodplain is based on hydrologic conditions prior to permit issuance.

08. Best Management Practices - Except as specified in the application, no debris, silt, sand, cement, concrete, oil or petroleum, organic material, or other construction related materials or wastes shall be allowed to enter into or be stored where it may be washed by rainfall or runoff into waters of the U.S. Silt fences, straw wattles, and other techniques shall be employed as appropriate to protect waters of the U.S. from sedimentation and other pollutants. Water used in dust suppression shall not contain contaminants that could violate surface water or aquifer standards. Permittees and their contractors shall take necessary steps to minimize channel and bank erosion within waters of the United States during and after construction. A copy of the permit conditions shall be provided to all contractors and subcontractors, and will be posted visibly at project construction sites.

09. Transportation Projects - Permittees shall implement State transportation agencies' guidelines for construction sites to protect water quality and aquatic habitat. In California, CALTRANS has guidance in the *CALTRANS Stormwater Quality Manuals and Handbooks*[3]; in Nevada NDOT has guidance in their *NDOT Water Quality Manuals*[4]; and in Arizona, ADOT has guidance in their *Erosion and Pollution Control Manual*[5].

10. Inspections - The permittee shall allow EPA representatives to inspect the authorized activity and any mitigation areas at any time deemed necessary to determine compliance with the terms and conditions of the NWP verification.

11. Buffers - Unless specifically determined to be impracticable by the Corps and EPA, for NWPs 29, 39, 40, and 42, the permittee shall establish and maintain upland buffers in perpetuity between upland structures constructed as part of the project approved by the NWP and all preserved open waters, streams and wetlands, including created, restored, enhanced or preserved waters of the U.S. Buffers should be vegetated whenever practicable. Plantings in buffers should be dominated by native species, and not include any federal or state listed invasive or noxious weed species[6]. Except in unusual circumstances, as determined by the Corps and EPA, buffers shall be at least 50 feet in width from the lateral limits of the Corp's jurisdiction[7].

12. *Protected Lands* - The permittee shall record the NWP verification with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title of interest in real property for areas designated to be preserved as part of compensatory mitigation for authorized impacts, including any associated covenants or restrictions.

13. *Impaired Water Bodies* - If a proposed activity would result in dredge or fill in water bodies listed as impaired under Section 303(d) of the CWA, the PCN or MPCN must include specific measures that will be used to avoid exacerbating the impairment(s).[8]

[3] http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

[4] http://www.nevadadot.com/About_NDOT/NDOT_Divisions/Engineering/Hydraulics/Water_Quality_BMP_Manuals.aspx

[5] http://www.azdot.gov/inside_adot/OES/Water_Quality/Stormwater/Manuals.asp

[6] http://plants.usda.gov/java/noxiousDriver

[7] Ordinary high water mark in non-tidal and the mean higher high water line in tidal waters

[8] EPA Region 9 lists of impaired water bodies: http://www.epa.gov/region9/water/tmdl/303d.html

Specific Nationwide Permits

NWP-01 Aids to Navigation - Subject to the General Conditions (GCs) above, this NWP is hereby programmatically certified.

NWP-02 Structures in Artificial Canals - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-03 Maintenance - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. "Currently serviceable structures" which may be maintained under this permit do not include undersized culverts or structures that cause or exacerbate channel incision, bank destabilization, and/or prevent fish and wildlife passage due to inadequate design or construction standards. Certification of this permit is granted only if the existing structure proposed to be maintained demonstrably preserves (via design, flow modeling or other information in the PCN) the natural functions of the affected aquatic resource when the structure is fully operational. Otherwise, an alternative permit should be utilized as appropriate (*e.g.*, NWP 13 Bank Stabilization). Where existing bank stabilization structures are to be maintained, bioengineered methods shall be utilized to the extent practicable in lieu of "rip-rap" or other hardscape engineered materials. This permit shall not authorize the enlargement of, or increase in, the footprint of a structure within waters of the U.S., unless that enlargement consists of the replacement of existing artificial channel armoring materials (e.g., rip-rap, soil cement, etc.) with low-impact bioengineered natural channel design structures (e.g., log revetments, geotextile rolls/mats, root wads, brush mattresses, willow wattling, etc.)

NWP-04 Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities
Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-05 Scientific Measurement Devices - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-06 Survey Activities - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-07 Outfall Structures and Associated Intake Structures - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-08 Oil and Gas Structures on the Outer Continental Shelf - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-09 Structures in Fleeting and Anchorage Areas - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-10 Mooring Buoys - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-11 Temporary Recreational Structures - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-12 Utility Line Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of waters of the U.S., including intermittent and ephemeral streams. Only the 300 linear foot limit may be waived by EPA upon approval, consistent with General Condition 02. *Waivers*. Under this certification, NWP 12 can only be used once for a single and complete project having independent utility. When NWP 12 is proposed for multiple locations a written determination will be provided describing independent utility of each impact location for approval by EPA, consistent with General Condition 01. *Notification*. Permittees are required to ensure that the construction of utility lines does not result in the draining of any water of the U.S., including wetlands. This may be accomplished through the use of clay blocks, bentonite, or other suitable material (as approved by EPA) to seal the trench. For utility line trenches, during construction, the permittee shall remove and stockpile, separately, the top 6 – 12 inches of topsoil. Following installation of the utility line(s), the permittee shall replace the stockpiled topsoil on top and seed the area with native vegetation.
NWP-13 Bank Stabilization - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of waters of the U.S., including intermittent and ephemeral streams. All bank stabilization activities under this permit shall involve either the sole use of native vegetation or other bioengineered design techniques (e.g. willow plantings, root wads, large woody debris, etc.) or a combination of hard-armoring (e.g. rock) and native vegetation or bioengineered design techniques, unless specifically determined to be impracticable by the EPA.
NWP-14 Linear Transportation Projects - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of non-tidal waters of the U.S., including intermittent and ephemeral streams, and 1/3 acre or 300 linear feet of tidal waters of the U.S. NWP 14 can only be used once for a single and complete project having independent utility. When NWP 14 is proposed for multiple locations a written determination will be provided describing independent utility of each impact location for approval by EPA, consistent with General Condition 01. *Notification*. All bank stabilization activities under this permit shall involve either the sole use of native vegetation or other bioengineered design techniques (e.g. willow plantings, root wads, large woody debris, etc.) or a combination of hard-armoring (e.g. rock) and native vegetation or bioengineered design techniques, unless specifically determined to be impracticable by the EPA.
NWP-15 U.S. Coast Guard Approved Bridges - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-16 Return Water from Upland Contained Disposal Areas - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-17 Hydropower Projects - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-18 Minor Discharges - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-19 Minor Dredging - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-20 Response Operations for Oil and Hazardous Substances - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-21 Surface Coal Mining Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Before an applicant may use this permit, EPA must approve a compensatory mitigation plan sufficient to ensure impacts to aquatic resource functions are minimal.
NWP-22 Removal of Vessels - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-23 Approved Categorical Exclusions - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-24 Indian Tribe or State Administered Section 404 Programs - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-25 Structural Discharges - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-26 [Reserved]
This NWP is no longer in use. No certification is necessary.
NWP-27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities - Subject to the GCs above, and the following permit-specific condition, this NWP is hereby programmatically certified. Upon review of a PCN or MPCN, consistent with General Condition 01. *Notification*, EPA will approve or deny on a case-by-case basis whether the proposed project will result in a net increase in aquatic resource functions and services, consistent with the NWP. An individual certification may be required in the event EPA denies approval of a waiver for this NWP.
NWP-28 Modifications of Existing Marinas - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-29 Residential Developments - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to 1/4 acre of impacts to non-tidal waters of the U.S. for single family houses, and the greater of 1/2 acre or 300 linear feet of impact to waters of the U.S. for multi-unit residential developments. Under this certification, this permit will not be used to approve residential developments and their attendant features within the 100-year floodplain. The 100-year floodplain is determined based on hydrologic conditions at the time of the NWP application. Recreational facilities such as playgrounds, playing fields, and golf courses are not authorized under this certification. These projects are separate and distinct from residential developments, are not required to be included in a residential development project for it to be practicable, and their construction within waters is normally avoidable.
NWP-30 Moist Soil Management for Wildlife - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-31 Maintenance of Existing Flood Control Facilities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Upon review of a PCN, consistent with General Condition 01. *Notification*, EPA will approve or deny on a case-by-case basis whether the proposed project will result in minimal impacts to waters of the U.S. for projects that include removal of levee vegetation.
NWP-32 Completed Enforcement Actions - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-33 Temporary Construction, Access, and Dewatering - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-34 Cranberry Production Activities - Subject to the GCs above, this NWP is hereby programmatically certified.
NWP-35 Maintenance Dredging of Existing Basins - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-36 Boat Ramps - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to 50 cubic yards of fill and ramps that are 20 feet wide or less.

NWP-37 Emergency Watershed Protection and Rehabilitation - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-38 Cleanup of Hazardous and Toxic Waste - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-39 Commercial and Institutional Developments - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Under this certification, this permit will not be used to approve commercial and institutional developments and their attendant features within the 100-year floodplain. The 100-year floodplain is determined based on hydrologic conditions at the time of the NWP application. Recreational facilities such as playgrounds, playing fields, and golf courses are not authorized under this certification. These projects are separate and distinct from commercial and institutional development, are not required to be included in such developments to be practicable, and their construction within waters is normally avoidable.

NWP-40 Agricultural Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Construction of farm ponds under this certification is limited to those that do not qualify for the Clean Water Act section 404(f)(1)(C) exemption because of the recapture provision at section 404(f)(2). Under this certification, no discharges are authorized which would impact hydrological connectivity between jurisdictional waters to such an extent as to convert waters of the U.S. to uplands, or otherwise isolate waters and eliminate federal regulatory jurisdiction. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of impacts to non-tidal waters of the U.S., including intermittent and ephemeral streams.

NWP-41 Reshaping Existing Drainage Ditches - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of impacts to non-tidal waters of the U.S., including intermittent and ephemeral streams. All sidecast materials from excavation must be stored and/or disposed of within non-jurisdictional uplands under this certification. A statement must be included in the notification as to how the applicant's activities will improve water quality. Under this certification, no discharges are authorized which would impact hydrological connectivity between jurisdictional waters to such an extent as to convert waters of the U.S. to uplands, or otherwise isolate waters to eliminate federal regulatory jurisdiction.

NWP-42 Recreational Facilities - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-43 Stormwater Management Facilities - Use of this NWP is not covered by this programmatic certification, and prospective users on tribal lands must seek individual project certification from EPA in all cases. NWP authorization of constructing stormwater facilities within waters of the U.S. discourages applicants from using practicable construction options that locate stormwater retention and detention facilities "off line" from streams. For example, retention facilities are often built as sediment (or debris) basins within a stream. This practice includes constructing a dam in the stream, excavating out a basin, and regular sediment removal to maintain the structure. These facilities cause considerable and unnecessary damages to stream functions as retention facilities can be located "off line" by constructing a high flow diversion channel above the ordinary high water mark. If applicants can continue to use the traditional, more damaging practices that are sanctioned by this NWP, there is no incentive for these management practices to improve. We do not believe NWP-43 for new facilities complies with the CWA Section 404(b)(1) Guidelines. CWA section 401 certification for this NWP is denied without prejudice. Applicants for projects on tribal lands must apply to EPA for individual certification if this NWP is proposed to be used. Applicants can apply for an individual certification by providing the same content required in a MPCN described in General Condition 01. *Notification*, of this certification.

NWP-44 Mining Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Applicants must ensure that mining activities (e.g., aggregate mining) approved by this NWP will not cause upstream head cutting or downstream incision. Notification to EPA shall include a narrative description and design drawing, when applicable, of any measure that will be implemented to comply with the condition. When used for in-stream aggregate mining activities, compensatory mitigation is likely to be required due to extensive indirect impacts and temporal losses typical of this type of impact.

NWP-45 Repair of Uplands Damaged by Discrete Events - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified.

Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of impacts to non-tidal waters of the U.S., including intermittent and ephemeral streams.

NWP-46 Discharges in Ditches

Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified.

Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of impacts to non-tidal waters of the U.S., including intermittent and ephemeral streams.

NWP-47 [Reserved] - This NWP is no longer in use. No certification is necessary.

NWP-48 Commercial Shellfish Aquaculture Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Under this certification, impacts to submerged aquatic vegetation are prohibited, consistent with NWP 19. *Minor Dredging*, and NWP 36. *Boat Ramps*.

NWP-49 Coal Remining Activities - Subject to the GCs above, and the following permit-specific conditions, this NWP is hereby programmatically certified. Unless approved by EPA, consistent with General Condition 02. *Waivers*, impacts under this permit are limited to the greater of 1/2 acre or 300 linear feet of impacts to non-tidal waters of the U.S., including intermittent and ephemeral streams. Applicants must provide information in the PCN illustrating that activities authorized under NWP-49 will result in a net increase in aquatic resource functions.

NWP-50 Underground Coal Mining Activities - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-51 Land-Based Renewable Energy Generation Facilities - Subject to the GCs above, this NWP is hereby programmatically certified.

NWP-52 Water-Based Renewable Energy Generation Pilot Projects - Subject to the GCs above, this NWP is hereby programmatically certified.

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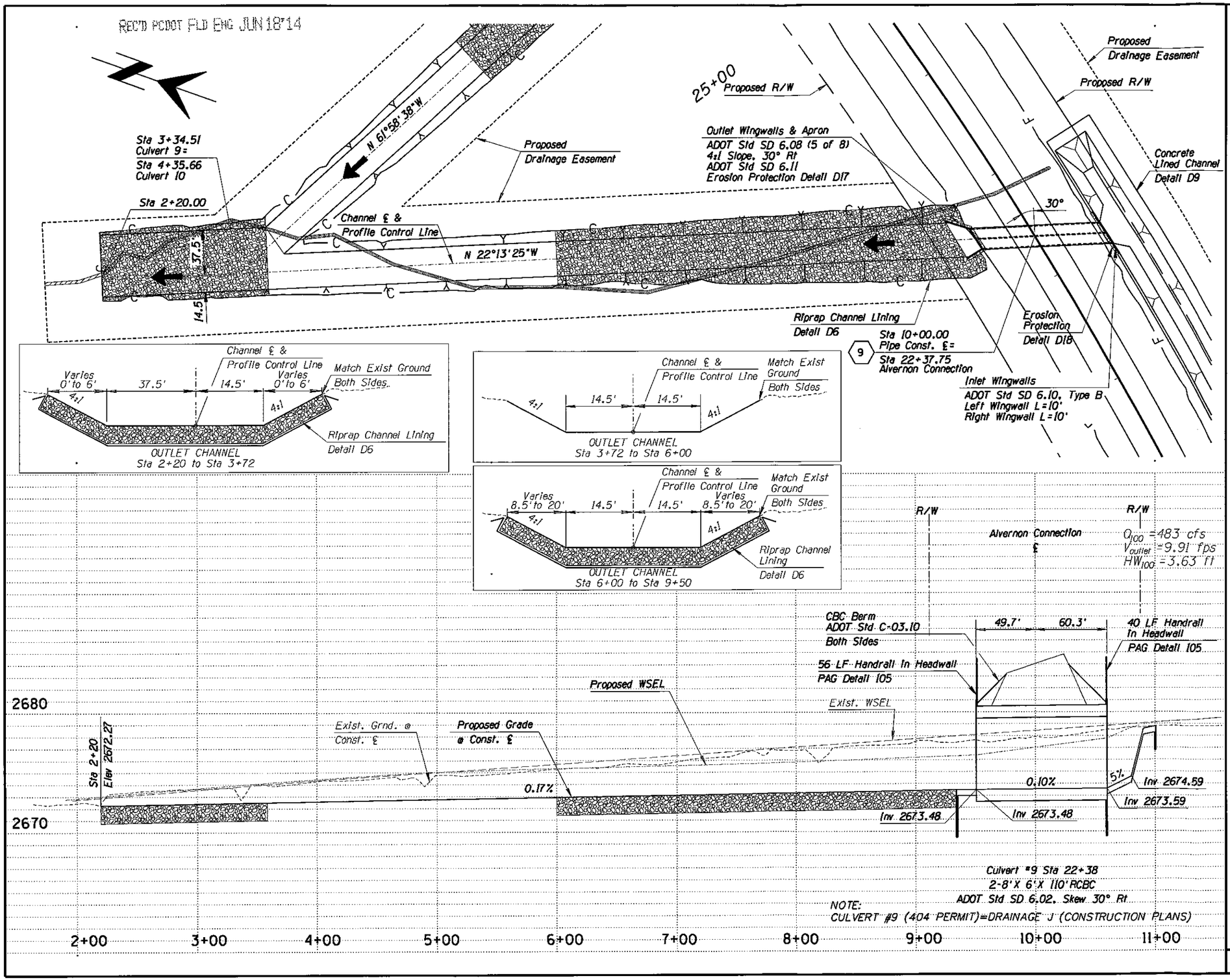


KEY

- DIRECTION OF FLOW
- EXISTING LOSS, WATERS OF U.S.
- PERMANENT LOSS, WATERS OF U.S.
- TEMPORARY LOSS WATERS OF U.S.
- RIPRAP
- PROPOSED WASH SLOPE LIMITS

DRAINAGE J CULVERT 9

LOSS TYPE	ACREAGE
PERMANENT	0.048
EXISTING	0.0
TEMPORARY	0.003

LATITUDE: 32.083313 N, NAD83
LONGITUDE: -110.911781 W, NAD83

CENTER OF PLAN VIEW

STA 2+20 TO 11+00 DRAINAGE J SECTION 404 IMPACTS

40 0 40 80'

Scale Horiz. 1"=40' Vert. 1"=4'

Sheet DC09 of DC16

PRISCILLA S. CORNELIO P.E., DIRECTOR

NO.	REVISION DESCRIPTION	ENGINEER	DATE

		DATE
DESIGNED	BR	4/14
DRAWN	AA	4/14
CHECKED	TW	4/14
PROJ. MGR.	ES	4/14

US Army Corps of Engineers®

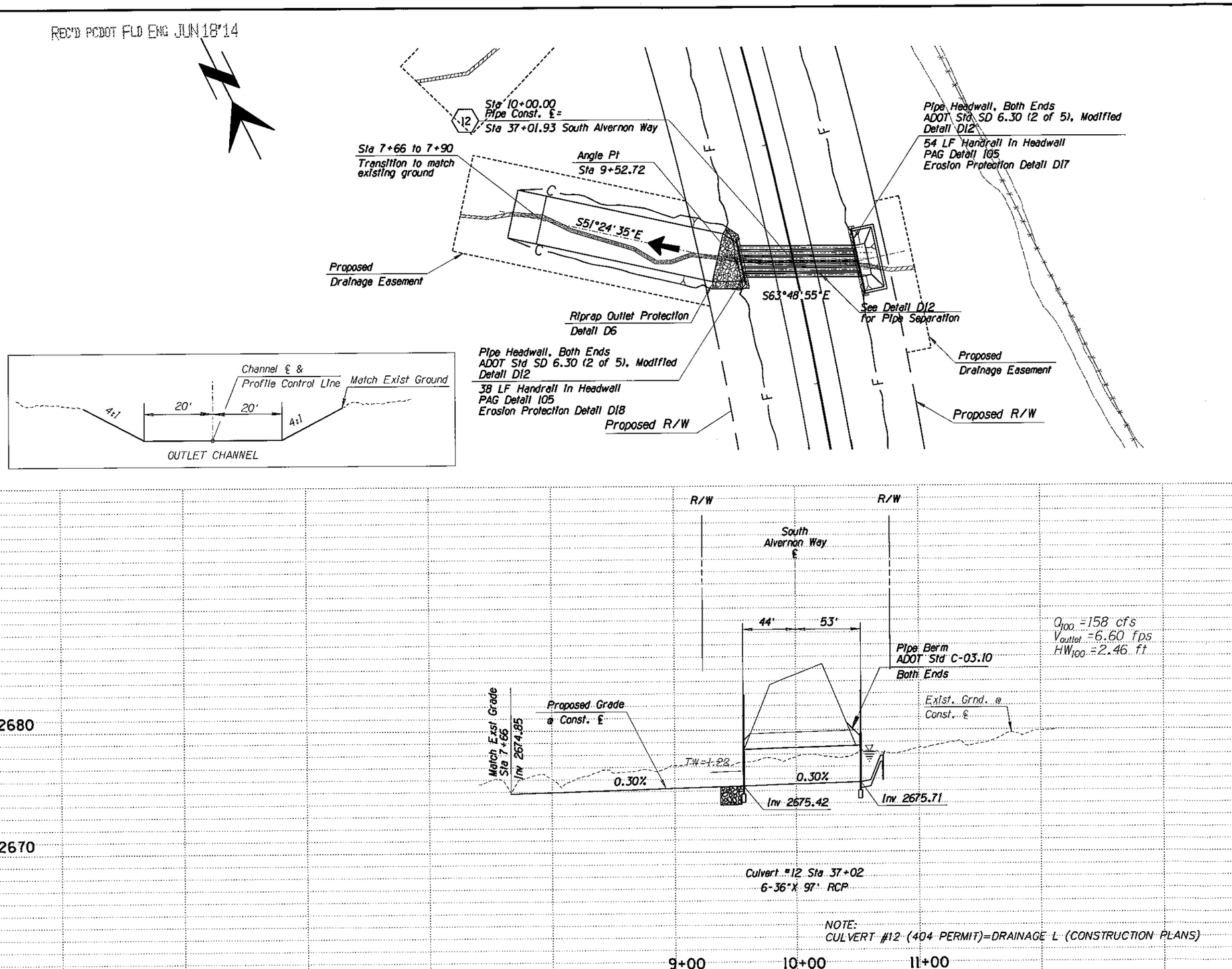
URS
333 East Wetmore, Suite 400
Tucson, AZ 85705
phone: 520-887-1800

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

HUGHES ACCESS ROAD
RELOCATION PROJECT NO. 4HARDR

Page of

REC'D PCDOT FLD ENG JUN 18'14



NOTE:
CULVERT #12 (404 PERMIT)=DRAINAGE L (CONSTRUCTION PLANS)

KEY

- DIRECTION OF FLOW
- EXISTING LOSS. WATERS OF U.S.
- PERMANENT LOSS. WATERS OF U.S.
- TEMPORARY LOSS WATERS OF U.S.
- RIPRAP
- PROPOSED WASH SLOPE LIMITS

DRAINAGE L
CULVERT 12

LOSS TYPE	ACREAGE
PERMANENT	0.021
EXISTING	0.0
TEMPORARY	0.004

LATITUDE: 32.086625 N, NAD83
LONGITUDE: -110.910142 W, NAD83

CENTER OF PLAN VIEW

STA 7+66 TO 10+71
DRAINAGE L
SECTION 404 IMPACTS

40 0 40 80'

Scale	Horiz. 1"=40' Vert. 1"=4'	Sheet DC12 of DC16	Page of

PRISCILLA S. CORNELIO P.E., DIRECTOR

		DATE
DESIGNED	BR	4/14
DRAWN	AA	4/14
CHECKED	TW	4/14
PROJ. MGR.	ES	4/14

NO.	REVISION DESCRIPTION	ENGINEER	DATE

US Army Corps of Engineers®

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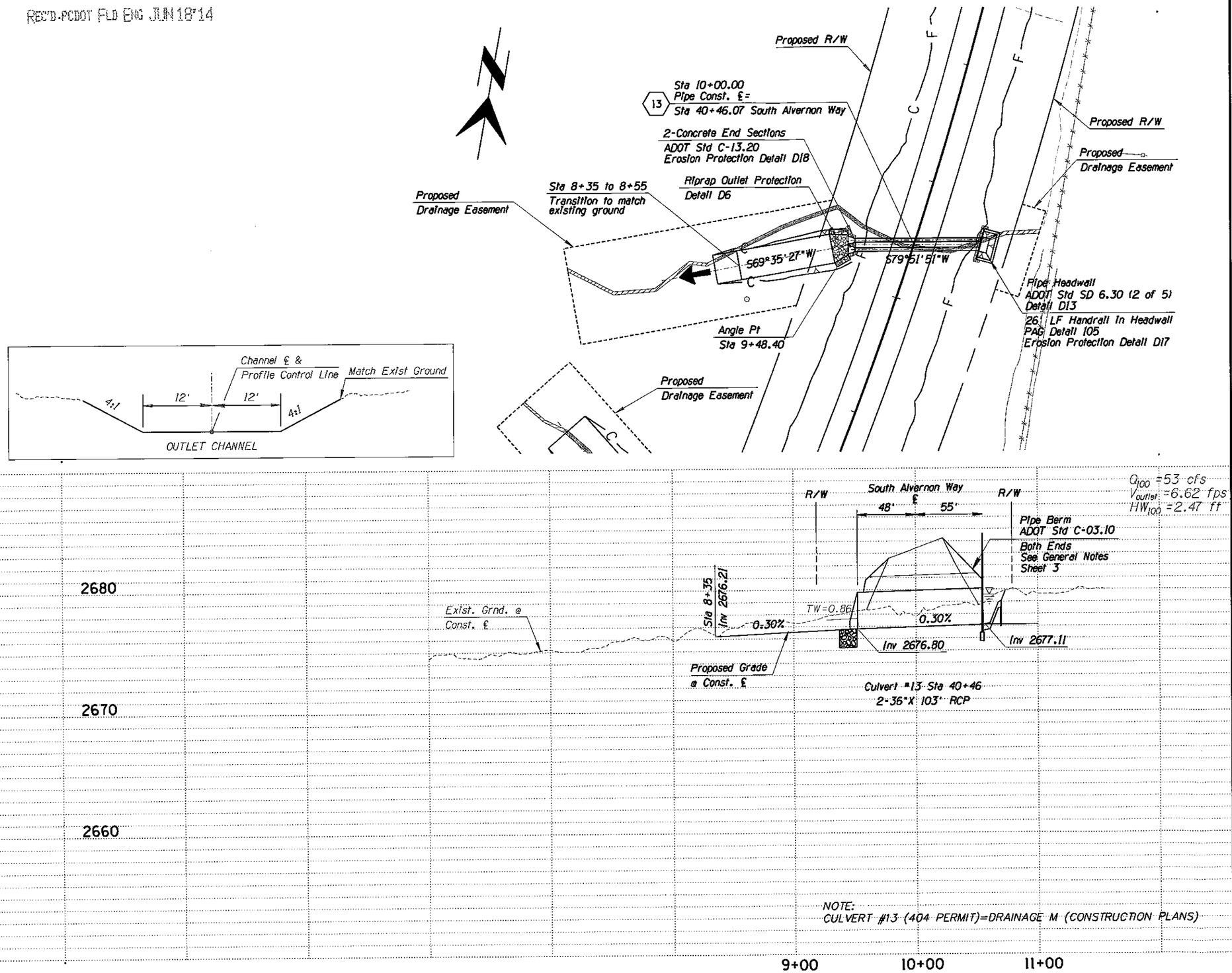
333 East Wetmore, Suite 400
Tucson, AZ 85705
phone: 520-887-1800

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

HUGHES ACCESS ROAD
RELOCATION PROJECT NO. 4HARDR

REC'D-PCDOT FLD ENG JUN 18'14



NOTE:
CULVERT #13 (404 PERMIT)=DRAINAGE M (CONSTRUCTION PLANS)

KEY

- DIRECTION OF FLOW
- EXISTING LOSS, WATERS OF U.S.
- PERMANENT LOSS, WATERS OF U.S.
- TEMPORARY LOSS WATERS OF U.S.
- PROPOSED WASH SLOPE LIMITS
- SAGUARO

DRAINAGE M
CULVERT 13

LOSS TYPE	ACREAGE
PERMANENT	0.017
EXISTING	0.0
TEMPORARY	0.010

LATITUDE: 32.087319 N, NAD83
LONGITUDE: -110.909964 W, NAD83

CENTER OF PLAN VIEW

STA 8+35 TO 10+70
DRAINAGE M
SECTION 404 IMPACTS

40 0 40 80'

Scale	Horiz. 1"=40' Vert. 1"=4'	Sheet DC13 of DC16	Page of

PRISCILLA S. CORNELIO P.E., DIRECTOR

		DATE
DESIGNED	BR	4/14
DRAWN	AA	4/14
CHECKED	TW	4/14
PROJ. MGR.	ES	4/14

NO.	REVISION DESCRIPTION	ENGINEER	DATE

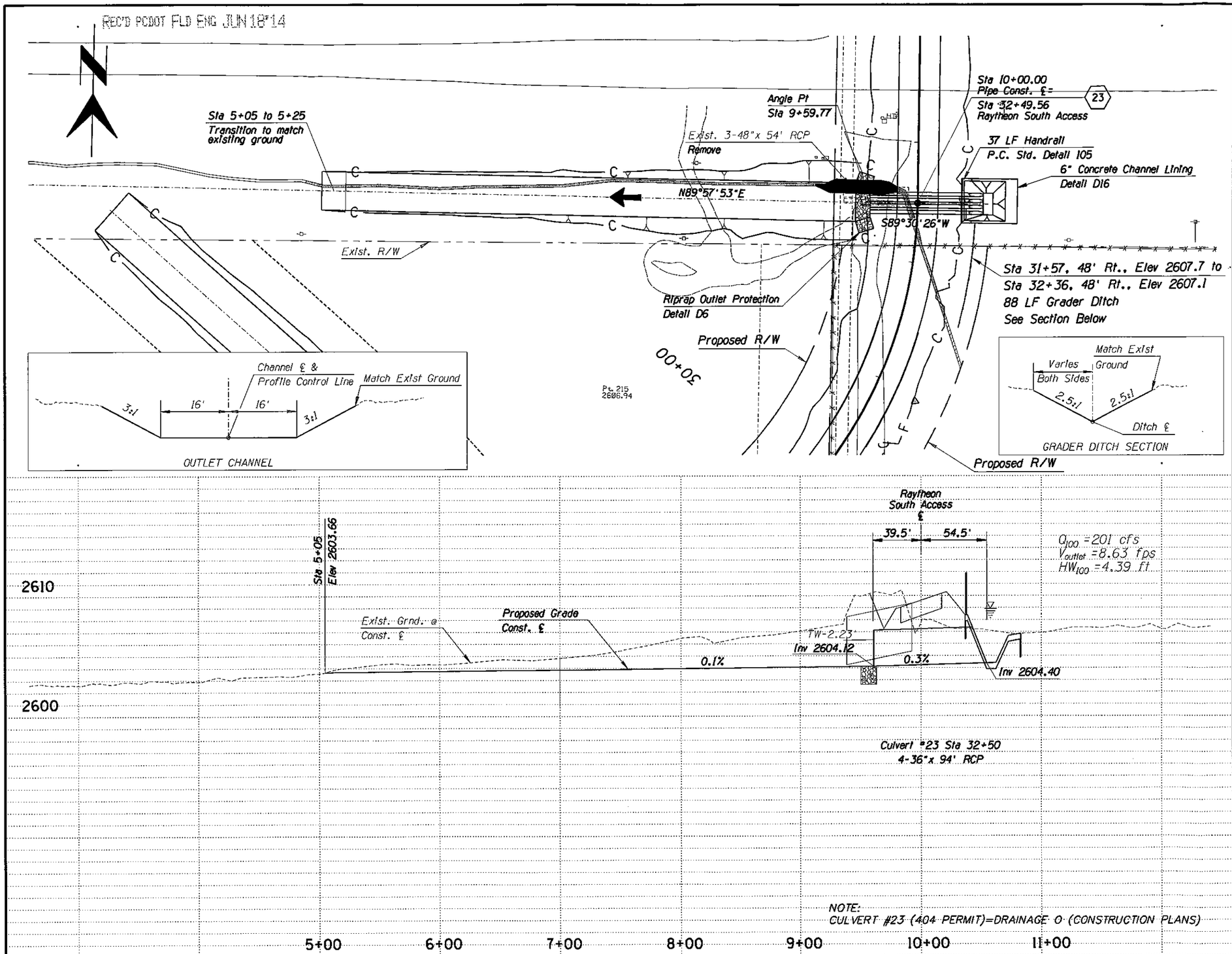
US Army Corps of Engineers®

URS
333 East Wetmore, Suite 400
Tucson, AZ 85705
phone: 520-887-1800

PIMA COUNTY DEPARTMENT OF TRANSPORTATION

HUGHES ACCESS ROAD
RELOCATION PROJECT NO. 4HARDR

REC'D PCDOT FLD ENG JUN 18'14



NOTE:
CULVERT #23 (404 PERMIT)=DRAINAGE O (CONSTRUCTION PLANS)

KEY

- DIRECTION OF FLOW
- EXISTING LOSS. WATERS OF U.S.
- PERMANENT LOSS. WATERS OF U.S.
- TEMPORARY LOSS WATERS OF U.S.
- RIPRAP
- NON-IMPACTED WATERS OF U.S.
- PROPOSED WASH SLOPE LIMITS

DRAINAGE O
CULVERT 23

LOSS TYPE	ACREAGE
PERMANENT	0.027
EXISTING	0.016
TEMPORARY	0.002

LATITUDE: 32.088556 N. NAD83
LONGITUDE: -110.944768 W. NAD83

CENTER OF PLAN VIEW

STA 5+05 TO 10+83
DRAINAGE O
SECTION 404 IMPACTS

40 0 40 80'

Scale	Horiz. 1"=40' / Vert. 1"=4'	Sheet DC16 of DC16	Page of

PRISCILLA S. CORNELIO P.E., DIRECTOR

		DATE
DESIGNED	BR	4/14
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NO.	REVISION DESCRIPTION	ENGINEER	DATE

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PIMA COUNTY DEPARTMENT OF TRANSPORTATION

HUGHES ACCESS ROAD
RELOCATION PROJECT NO. 4HARDR

APPENDIX G

Scoping Letters and Responses

PIMA COUNTY

DEPARTMENT OF TRANSPORTATION
201 NORTH STONE AVENUE, FOURTH FLOOR
TUCSON, ARIZONA 85701-1207

PRISCILLA S. CORNELIO, P. E.
DIRECTOR

(520) 724-6410
FAX (520) 724-6439

Office Administrator
Rural Metro Fire
490 W. Magee Road
Tucson, Arizona 85704

October 29, 2013

Re: Hughes Access Road Relocation
PCDOT Project No. 4HARDR

Dear Office Administrator,

The Pima County Department of Transportation is planning to relocate the existing 2-lane section of Hughes Access Road immediately south of Tucson International Airport from just east of Old Nogales Highway to Alvernon Way. A portion of the proposed project is located on land operated by the Tucson Airport Authority and obligated to the Federal Aviation Administration (Figure 1). This letter is a request for comments, concerns, or issues relevant to the project.

The proposed project would construct a new 2-lane section of Hughes Access Road approximately 2,500 feet south of the existing alignment, for an approximate total length of 4 miles. The proposed roadway corridor would be 150 to 170 feet wide. The improvements on East Hughes Access Road would be considered interim until future funds become available to design and build a 4-lane median-divided corridor 300 foot wide from Old Nogales Highway to Interstate 10. The purpose of this project is to accommodate land use plans for adjacent aerospace and defense related businesses and future Pima County transportation plans. The existing Hughes Access Road would be abandoned once the relocation is completed. This project is included in the Pima County Economic Development Plan, 2012 to 2014.

The scope of work for this project includes:

- Relocation of existing 2-lane undivided roadway and tie-back into extension of Alvernon Way for approximately 4 miles;
- Two 11-foot lanes with 10-foot shoulders on either side of the roadway (6 feet paved and 4 feet graded);
- Construction of an entry road to Raytheon;
- Construction of turn lanes, where appropriate;
- Construction of drainage improvements, where appropriate; and
- New traffic signal at the new intersection of East Hughes Access Road and South Hughes Access Road.

Project construction could occur as early as mid 2014 to mid 2015. Right-of-way acquisition for land not currently owned by Pima County would be required from the Tucson Airport Authority and the City of Tucson. Access to all adjacent properties would be maintained during construction, and construction activities

would be scheduled to avoid disrupting activities at the adjacent properties. The project's preliminary estimated cost is $12.7 million and would be completely funded by Pima County.

This letter serves as your invitation to review the proposed project based on the scope of work outlined above. If you have any specific concerns or suggestions pertaining to the specific proposed project, please let us know.

Please submit your comments or concerns by November 29, 2013, or sooner if possible, to Jonathan Rigg by e-mail at jrigg@swca.com; by phone at 520.325.9194, ext. 4918; by fax at 520.325.2033; or mail them to:

Jonathan Rigg
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701

Thank you for your time and assistance.

Sincerely,

Karla Reeve-Wise
Pima County Department of Transportation
Enclosure: Figure 1

c: Jordan Feld, Tucson Airport Authority
Jared Raymond, Federal Aviation Administration

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
— PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

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COMMISSIONERS
CHAIRMAN, J.W. HARRIS, TUCSON
ROBERT E. MANSELL, WINSLOW
KURT R. DAVIS, PHOENIX
EDWARD "PAT" MADDEN, FLAGSTAFF
DIRECTOR
LARRY D. VOYLES
DEPUTY DIRECTOR
TY E. GRAY

November 1, 2013

Jonathan Rigg
SWCA Environmental Consultants
343 West Franklin Street
Tucson, Arizona 85701

Re: Hughes Access Road Relocation PCDOT Project No. 4HARDR

Dear Mr. Rigg:

The Arizona Game and Fish Department (Department) has received and reviewed PCDOT's letter dated Oct. 29, 2013 regarding the above referenced project. The search PCDOT conducted of our HDMS data base using our On-line Environmental Review Tool (receipt 20130410020102) indicates there are recorded observations of Pima Pineapple Cactus within 3 miles of your project area. The Department recommends you contact the U.S. Fish and Wildlife Service) FWS for details on effects to endangered or threatened species and/or their habitats. The FWS will provide conservation measures to avoid or minimize effects, ensure protection of listed species, and ensure that your project is in compliance with the ESA.

The Department has no further comments at this time. If you have questions or concerns regarding this letter, please give me a call at 623 236-7513.

Sincerely,

Daniel E. Nelson
Project Evaluation Specialist

M13-10311911
Cc: John Windes, AGFD; Debra Bills, FWS

Angela Barclay

From: Crawford, Cat [cat_crawford@fws.gov]
Sent: Thursday, August 22, 2013 10:27 AM
To: Angela Barclay; Dean Papajohn; Karla Reeve Wise
Cc: Scott Richardson; Julie Crawford
Subject: Hughes Access Road Relocation - Meeting Recap

Follow Up Flag: Follow up
Flag Status: Flagged

Hello Karla,

Thank you for meeting with USFWS to initiate coordination for the Hughes Access Road Relocation Project. Based on discussions at the meeting, we understand that the Federal Aviation Administration, in conjunction with PCDOT, will be requesting formal consultation regarding effects of the proposed action to the Pima pineapple cactus (PPC). The consultation will also likely request concurrence for effects to the lesser long-nosed bat (LLNB). We understand that this is a high priority project for Pima County, and we want to work with you and your staff to make sure that we can accomplish the ESA Section 7 consultation in a timely manner. Below are several items we discussed during the meeting that will be important to include in the biological assessment (BA) submitted to us with the request for consultation.

1. PCDOT stated that the initial study area was ~295 acres. However, additional lands on the west end of the proposed ROW still need to be surveyed. Numerous PPC and saguaro cacti have been identified within the initial study area.

2. PCDOT stated that PPC will be mitigated at 1:1 per acre of disturbed PPC habitat. To determine acreage for PPC mitigation, we discussed the need to make sure you include all areas that will be disturbed for the new road relocation as well as future utility development and any other future activities that will be included as part of the proposed action. You stated that this may include a 150-170 foot wide section along the entire length of the new road. We also talked about the need to include an explanation in the BA for any areas that will not be included as suitable PPC habitat in the disturbed area (i.e., soil types that do not support PPC, drainages). It would be helpful if you provide this information to us to review prior to submitting the formal request for consultation.

3. We discussed the fact that the USFWS does not recognize transplanting PPC as an appropriate mitigation tool at this time. However, if you want to include transplanting individual cacti as part of your proposed action, then please work with Julie Crawford (and myself) of our office to determine methodology to include in the biological assessment. We understand that there are currently ~6 individual PPC that have been identified in the area that will be disturbed.

4. PCDOT stated that saguaros will be replaced at 1:1 for saguaros within the project area that cannot be avoided or relocated. Relocated and replaced saguaros should be planted in the project area. Because saguaros are a primary forage plant for the LLNB, we stated that this conservation measure would likely result in overall effects to the species that meet the "May Affect, Not Likely to Adversely Affect" standard for the LLNB. We discussed the need to determine the number of saguaros in the ROW that will be disturbed and lost. This should be included in the BA as part of the discussion of effects to the LLNB.

5. We also discussed the major buffelgrass infestation south of the proposed ROW. We understand that this will be impossible to mitigate entirely, and know that PCDOT will address the issue to the best of their ability. Please include a discussion of this in the BA.

Please do not hesitate to contact me if you have any questions. If we can work together to make sure that the BA has all the required information when it is submitted to us as part of your request for consultation, then we will be able to turn-around the consultation document in a timely manner.

Sincerely,

Cat

Cat Crawford
Arizona Ecological Services Office
US Fish and Wildlife Service
201 N Bonita Avenue, Suite 141
Tucson AZ 85745
(520) 670-6150 x 232 voice
(520) 670-6154 fax

When we show our respect for other living things, they respond with respect for us. -Arapaho-