



Final

Environmental Assessment

Addressing the Angel Thunder
Personnel Recovery/Rescue Training
Exercise in the Southwestern United
States

Volume II



May
2017

ABBREVIATIONS AND ACRONYMS

µg/m ³	micrograms per cubic meter	dba	A-weighted decibels
AA	Alert Area	DNL	Day-Night Sound Level
ABW	Air Base Wing	DOD	Department of Defense
ACC	Air Combat Command	DPS	Department of Public Safety
ACP	Airspace Control Plan	DZ	drop zone
AFB	Air Force Base	EA	Environmental Assessment
AFI	Air Force Instruction	EIAP	Environmental Impact Analysis Process
AFPD	Air Force Policy Directive	EIS	Environmental Impact Statement
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health	EO	Executive Order
AGL	above ground level	ESA	Endangered Species Act
AICUZ	Air Installation Compatible Use Zone	FAA	Federal Aviation Administration
APCD	Air Pollution Control District	FAR	Federal Aviation Regulation
APE	area of potential effect	FARP	forward aircraft refueling point
AQCR	air quality control region	FONSI	Finding of No Significant Impact
AR	Aerial Refueling Track	FR	Federal Register
ARB	Air Reserve Base	FW	Fighter Wing
ARTCC	Air Route Traffic Control Center	HLZ	helicopter landing zone
AT	Angel Thunder	IAP	International Airport
ATC	Air Traffic Control	ICRMP	Integrated Cultural Resources Management Plan
BMGR	Barry M. Goldwater Range	INRMP	Integrated Natural Resources Management Plan
CAA	Clean Air Act	IR	instrument route
CEQ	Council on Environmental Quality	ISR	Intelligence Surveillance and Reconnaissance
CFR	Code of Federal Regulations	LATN	low altitude tactical navigation
CO	carbon monoxide	L _{eq}	Equivalent Sound Level
CO ₂	carbon dioxide	LTO	landing takeoff cycle
CO _{2e}	carbon dioxide equivalent	LZ	landing zone
CRO	Combat Rescue Officer	MBTA	Migratory Bird Treaty Act
CSAR	Combat Search and Rescue	mg/m ³	milligrams per cubic meter
CTS	Combat Training Squadron		
dB	decibel		

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Mgpy	megagrams per year	RA	Restricted Area
MOA	Military Operations Area	RCRA	Resource Conservation and Recovery Act
MOU	Memorandum of Understanding	ROI	region of influence
MOUT	military operations in urban terrain	RQG	Rescue Group
MSL	mean sea level	RQS	Rescue Squadron
MTR	military training route	SERE	Survival, Evasion, Resistance and Escape
NAAQS	National Ambient Air Quality Standards	SFAR	Special Federal Aviation Regulation
NAR	non-conventional assisted recovery	SHPO	State Historic Preservation Officer
NAS	Naval Air Station	SO ₂	sulfur dioxide
NEPA	National Environmental Policy Act	SPCC	Spill Prevention Control and Countermeasures
NHPA	National Historic Preservation Act	SR	Slow Route
NF	National Forest	SUA	special use airspace
NM	nautical mile(s)	TCPs	traditional cultural properties
NO ₂	nitrogen dioxide	THPO	Tribal Historic Preservation Officer
NO _x	nitrogen oxides	tpy	tons per year
NOTAM	Notice to Airmen	U.S.	United States
NRHP	National Register of Historic Places	UAS	unmanned aerial system
O ₃	ozone	USAF	U.S. Air Force
Pb	lead	U.S.C.	United States Code
PCE	primary constituent element	USEPA	U.S. Environmental Protection Agency
PM ₁₀	particulate matter equal to or less than 10 microns in aerodynamic diameter	USFS	U.S. Forest Service
PM _{2.5}	particulate matter equal to or less than 2.5 microns in aerodynamic diameter	USFWS	U.S. Fish and Wildlife Service
POL	petroleum, oil, and lubricants	VR	visual route
ppb	parts per billion	VOC	volatile organic compound
ppm	parts per million	WA	warning area
PR	Personnel Recovery	WTA	water training area
PSD	Prevention of Significant Deterioration	ZAB	Albuquerque
		ZLA	Los Angeles
		µg/m ³	micrograms per cubic meter

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**ENVIRONMENTAL ASSESSMENT
ADDRESSING THE ANGEL THUNDER PERSONNEL
RECOVERY/RESCUE TRAINING EXERCISE
IN THE
SOUTHWESTERN UNITED STATES
VOLUME II**

**AIR FORCE CIVIL ENGINEER CENTER
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MAY 2017

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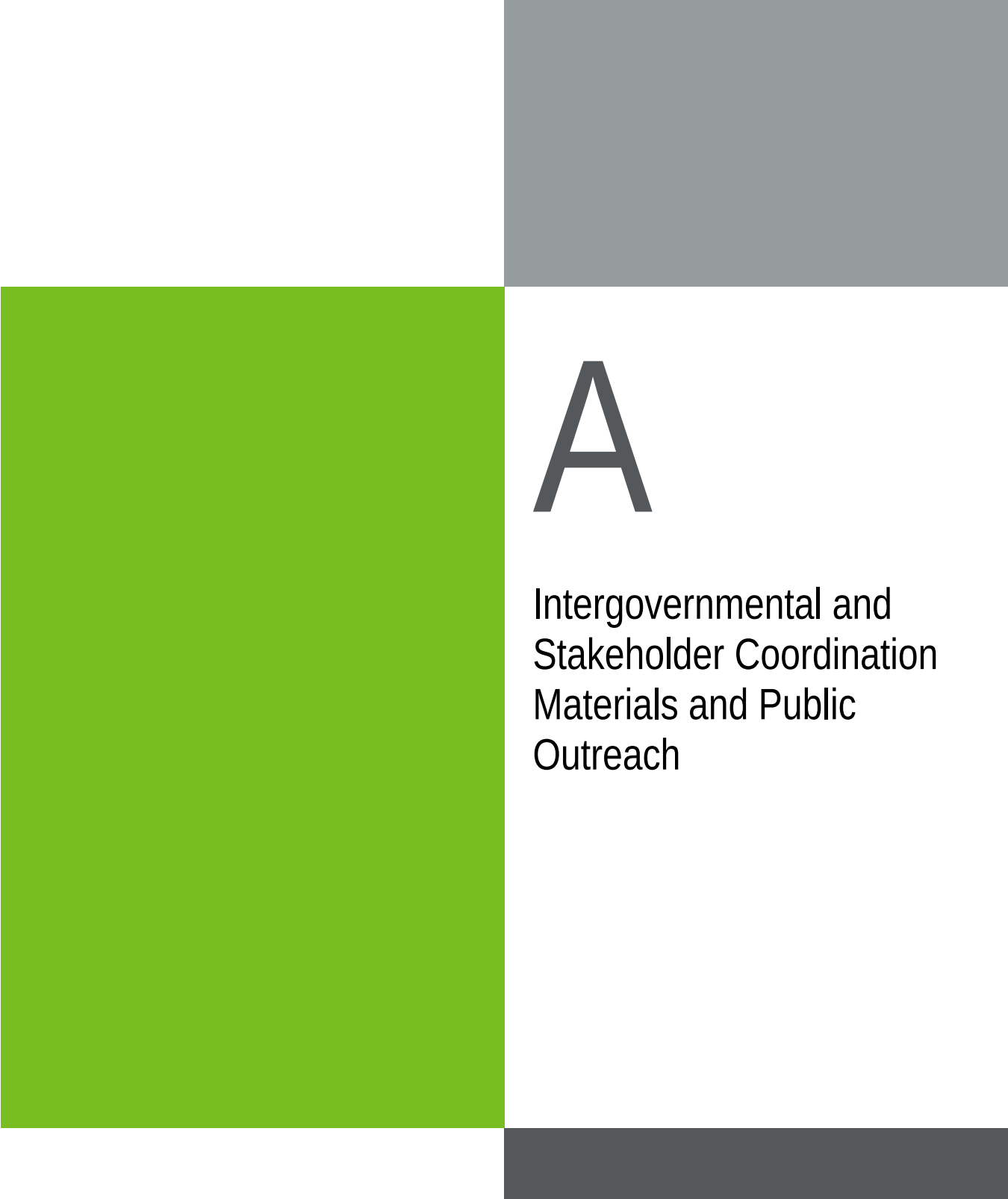
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A

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Materials and Public
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Dear Mr. Valencia:

REFERENCE: Section 106 Consultation Initiation and Description of the Proposed Action and Alternatives (DOPAA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

The U.S. Air Force (USAF) has prepared a Description of the Proposed Action and Alternatives (DOPAA) for the *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States* in accordance with the National Environmental Policy Act (NEPA). The DOPAA is provided as Attachment 1 to this letter. The environmental impact analysis process for this proposal is being conducted by the USAF in accordance with the Council on Environmental Quality regulations pursuant to requirements of NEPA.

The USAF is undertaking a NEPA analysis for this training based on the proposal to develop Air Combat Command's Angel Thunder Personnel Recovery (PR)/Rescue Training Exercise. The Angel Thunder training exercise is a large-scale exercise developed in 2006 that is conducted out of the southwestern United States and primarily centered out of Davis-Monthan Air Force Base (AFB), Arizona. The Angel Thunder training is proposed to become biannual and would combine PR training for pararescue combat aircrews with training for intelligence personnel, battle managers, and joint search and rescue center personnel. The DOPAA will support the subsequent preparation of an EA and will become Sections 1 and 2 of the Draft EA.

This proposal would meet the Air Force's responsibilities under Department of Defense Directive (DODD) 3002.01 to ensure PR preparation efforts keep pace with changes in the global operating environment; be prepared to plan and execute PR operations with other interagency partners; and be prepared to conduct interoperable and mutually cooperative PR operations with partner and host nations to rescue Department of Defense (DOD) personnel whenever possible.

The USAF is complying with Section 106 of the National Historic Preservation Act (NHPA) concurrently with development of the EA as recommended by NEPA's implementing regulations, Title 40 Code of Federal Regulations (CFR) Part 1502.25(a). In accordance with 36 CFR Part 800.3(c), this letter initiates our Section 106 consultation for this undertaking and requests your input on the proposal as described in the attached DOPAA. The USAF is particularly interested in your input on properties at or

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near the proposed training locations that may have religious and cultural significance to your tribe and, if such properties exist, to help assess how the proposed action might affect them.

In accordance with NEPA and the USAF's implementing regulations, 32 CFR Part 989.14(l), the USAF is also seeking your input on the proposal as described in the attached DOPAA. Government-to-government consultation between the USAF and your tribe for this effort is also in accordance with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Air Force Instruction (AFI) 32-7065, *Cultural Resources Management Program*; and AFI 90-2002 *Air Force Interactions with Federally-Recognized Tribes*.

The proposed undertaking consists of updating the biannual two to three week Angel Thunder training exercise throughout the southwestern U.S., primarily centered out of Davis-Monthan AFB. The Angel Thunder exercise is the largest and most realistic joint service, multinational, interagency Combat Search and Rescue exercise designed to provide training for PR assets using a variety of scenarios to simulate deployment conditions and contingencies. The Proposed Action includes using additional DOD and non-DOD owned properties desired for use as landing zones and helicopter landing zones; increased numbers and types of American and foreign aircraft at Davis-Monthan AFB and related training airspace and ranges; and an increased number of aircraft training sorties.

- Proposed training sites are on federal, tribal, state, municipal, and private land in areas of New Mexico, Arizona, California, and Nevada that have been previously disturbed or are currently or previously used for the activities conducted under the Proposed Action.
- Up to 3,000 personnel could be engaged in an Angel Thunder exercise, with international participation limited to five nations per training event.
- Training would include the following: day/night extractions; day/night infiltration/evasion/exfiltration training; aircraft refueling; tactical combat maneuvering by fixed- and rotary-wing aircraft; airdrops of personnel and equipment (freefall- and static line-parachute operations from all altitudes); water hoists; and landing on unimproved surfaces. Live fire would be conducted at previously approved target areas at the Barry M. Goldwater Range and existing small arms ranges. Operations would not include construction or ground disturbing activities.
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- Depending on location and suitability, operation centers would be set up at one or more forward operating airfields with small tent cities of no more than three or four tents set up to support Command and Control activities. Alternatively, a similar number of conex shipping containers or recreational vehicles may be used to achieve the same objective.

More details on the proposed undertaking and training locations are provided in the attached DOPAA (Attachment 1).

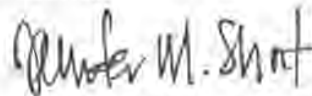
The USAF has conducted searches of publicly available records, the National Register of Historic Places, Arizona's Cultural Resource Inventory (AZSITE), and the New Mexico Cultural Resources Information System (NMCRIS) to identify cultural properties at proposed non-DOD training locations. Training locations on DOD facilities have been previously analyzed and approved for activities similar to the proposed undertaking under a variety of Cultural Resource Management Plans, EAs, and Environmental Impact Statements, which have also been reviewed.

- The USAF has identified 20 sites within 100 m of proposed non-DOD training locations in Arizona. Eleven sites are post-contact sites, six sites are pre-contact sites, and three sites are not clearly identified in site records. Attachment 2 includes tables providing additional information on sites identified in the record search, including NRHP eligibility.
- In addition, the Bisbee Douglas International Airport, Coolidge Airport, Flagstaff Pulliam Airport, Grand Canyon Valle Airport, H.A. Clark Memorial Field, Phoenix Sky Harbor, Springerville Airport, and Winslow-Lindbergh Regional Airport are historic-age airports in Arizona that may contain historic facilities that have not been officially recorded. Unrecorded historic structures have also been identified at the Anita Station, Black Mesa, and Mormon Lake locations.
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- In addition, the Negrito Airstrip and Reserve Airport in New Mexico are historic-age airfields with potential for unrecorded historic facilities.

The USAF is concurrently seeking additional information regarding historic properties within or near the APE from the Arizona State Historic Preservation Office, the New Mexico Historic Preservation Division, and nationally-recognized tribes. Although the Angel Thunder training would also occur at locations in California and Nevada, these would be at permitted DOD sites already governed by the installations' environmental policies and procedures. Therefore, the USAF is not undertaking Section 106 consultation with the SHPOs in Nevada and California.

Please address questions regarding this consultation to Kevin L. Wakefield at 520-228-4035. Thank you.

Sincerely,



JENNIFER M. SHORT, Colonel, USAF
Vice Commander

2 Attachments:

1. Description of the Proposed Action and Alternatives
2. List of Previously Identified Sites

Courtesy copies sent to:

Ms. Kelly Gomez, Land Use Department

Example Agency Scoping Letter



DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

Colonel Jennifer M. Short
Vice Commander, 355th Fighter Wing
3405 S. Fifth St
Davis-Monthan AFB AZ 85707

Arizona Army National Guard
Florence Military Reservation
Public Affairs Office
5636 East McDowell Road
Phoenix, AZ 85008

To whom it may concern:

REFERENCE: Section 106 Consultation Initiation and Description of the Proposed Action and Alternatives (DOPAA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

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The USAF is undertaking a NEPA analysis for this training based on the proposal to develop Air Combat Command's Angel Thunder Personnel Recovery (PR)/Rescue Training Exercise. The Angel Thunder training exercise is a large-scale exercise developed in 2006 that is conducted throughout the southwestern United States and primarily centered out of Davis-Monthan Air Force Base (AFB), Arizona. The Angel Thunder training is proposed to become biannual. The biannual exercise would combine PR training for pararescue combat aircrews with training for intelligence personnel, battle managers, and joint search and rescue center personnel. The DOPAA will support the subsequent preparation of an EA and will become Sections 1 and 2 of the Draft EA.

This proposal would meet the Air Force's responsibilities under Department of Defense Directive (DODD) 3002.01 to ensure PR preparation efforts keep pace with changes in the global operating environment; be prepared to plan and execute PR operations with other interagency partners; and be prepared to conduct interoperable and mutually cooperative PR operations with partner and host nations to rescue Department of Defense (DOD) personnel whenever possible.

In accordance with NEPA and the USAF's implementing regulations, 32 CFR Part 989.14(l), the USAF is also seeking your input on the proposal as described in the enclosed DOPAA. NEPA requirements help ensure environmental information is made available to the public during the decision-making process and prior to actions being taken. A premise of NEPA is that the quality of Federal

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decisions will be enhanced if the public is involved in the planning process. The Intergovernmental Coordination Act and Executive Order 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider territorial and local views when implementing a Federal proposal. Therefore, Davis-Monthan AFB is notifying you of the Proposed Action to give you the opportunity to provide comments on the action.

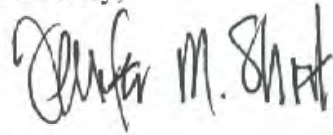
The proposed undertaking consists of updating the biannual two to three week Angel Thunder training exercise throughout the southwestern U.S., primarily centered out of Davis-Monthan AFB. The Angel Thunder exercise is the largest and most realistic joint service, multinational, interagency Combat Search and Rescue exercise designed to provide training for PR assets using a variety of scenarios to simulate deployment conditions and contingencies. The Proposed Action includes using additional non-Department of Defense (DOD) and non-DOD owned properties desired for use as landing zones and helicopter landing zones; increased numbers and types of American and foreign aircraft at Davis-Monthan AFB and related training airspace and ranges; and an increased number of aircraft training sorties.

- Proposed training sites are on federal, tribal, state, municipal, and private land in areas of New Mexico, Arizona, California, and Nevada that have been previously disturbed or are currently or previously used for the activities conducted under the Proposed Action.
- Up to 3,000 personnel could be engaged in an AT exercise, with international participation limited to five nations per training event.
- Training would include the following: day/night extractions; day/night infiltration/evasion/exfiltration training; aircraft refueling; tactical combat maneuvering by fixed- and rotary-wing aircraft; airdrops of personnel and equipment (freefall- and static line-parachute operations from all altitudes); water hoists; and landing on unimproved surfaces. Live fire would be conducted at previously approved target areas at the Barry M. Goldwater Range and existing small arms ranges. Operations would not include construction or ground disturbing activities.
- All vehicular ground operations would be conducted using existing paved and unpaved roads.
- Depending on location and suitability, operation centers would be set up at one or more forward operating airfields with small tent cities of no more than three or four tents set up to support Command and Control activities. Alternatively, a similar number of conex shipping containers or recreational vehicles may be used to achieve the same objective.

More details on the proposed undertaking and training locations are provided in the enclosed DOPAA (Attachment 1).

Please address questions regarding this consultation to Kevin L. Wakefield at 520-228-4035. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer M. Short". The signature is fluid and cursive, with the first name being the most prominent.

JENNIFER M. SHORT, Colonel, USAF
Vice Commander

Attachment:

Compact Disc of the Description of the Proposed Action and Alternatives

Example Section 106 Initiation Letter to Agency



DEPARTMENT OF THE AIR FORCE
414TH COMBAT TRAINING SQUADRON (ACC)
NELLIS AIR FORCE BASE, NEVADA

Colonel Gregory S. Marzolf
Commander, 414 Combat Training Squadron
4430 Grissom Avenue
Nellis Air Force Base, NV 89191

October 17, 2016

Mr. Jeff Pappas
Department of Cultural Affairs
407 Galisteo Street, Suite 236
Santa Fe, NM 87501

Subject: Section 106 Consultation Initiation and Description of the Proposed Action and Alternatives (DOPAA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

Dear Mr. Pappas:

1. The U.S. Air Force (USAF) has prepared a Description of the Proposed Action and Alternatives (DOPAA) for the *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States* in accordance with the National Environmental Policy Act (NEPA). The DOPAA is provided as Attachment 1 to this letter. The environmental impact analysis process for this proposal is being conducted by the USAF in accordance with the Council on Environmental Quality regulations pursuant to requirements of NEPA.
2. The USAF is undertaking a NEPA analysis for this training based on the proposal to develop Air Combat Command's Angel Thunder Personnel Recovery (PR)/Rescue Training Exercise. The Angel Thunder training exercise is a large-scale exercise developed in 2006 that is conducted throughout the southwestern United States and primarily centered out of Davis-Monthan Air Force Base (AFB), Arizona. The Angel Thunder Training is proposed to become biannual. The biannual exercise would combine PR training for pararescue combat aircrews with training for intelligence personnel, battle managers, and joint search and rescue center personnel. The DOPAA will support the subsequent preparation of an EA and will become Sections 1 and 2 of the Draft EA.

This proposal would meet the Air Force's responsibilities under Department of Defense Directive (DODD) 3002.01 to ensure PR preparation efforts keep pace with changes in the global operating environment; be prepared to plan and execute PR operations with other interagency partners; and be prepared to conduct interoperable and mutually cooperative PR operations with partner and host nations to rescue Department of Defense (DOD) personnel whenever possible.

3. The USAF is complying with Section 106 of the National Historic Preservation Act (NHPA) concurrently with development of the EA as recommended by NEPA's implementing regulations, Title 40 Code of Federal Regulations (CFR) Part 1502.25(a). In accordance with 36 CFR Part 800.3(c), this letter initiates our Section 106 consultation for this undertaking and requests your input on the proposal as

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described in the enclosed DOPAA. The USAF welcomes your comments and concerns regarding known culturally and historically significant properties at or near the proposed training locations.

4. The proposed undertaking consists of updating the biannual two to three week Angel Thunder training exercise throughout the southwestern U.S., primarily centered out of Davis-Monthan AFB. The Angel Thunder exercise is the largest and most realistic joint service, multinational, interagency Combat Search and Rescue exercise designed to provide training for PR assets using a variety of scenarios to simulate deployment conditions and contingencies. The Proposed Action includes using additional DOD and non-DOD owned properties desired for use as landing zones and helicopter landing zones; increased numbers and types of American and foreign aircraft at Davis-Monthan AFB and related training airspace and ranges; and an increased number of aircraft training sorties.

- a. Proposed training sites are on federal, tribal, state, municipal, and private land in areas of New Mexico, Arizona, California, and Nevada that have been previously disturbed or are currently or previously used for the activities conducted under the Proposed Action.
- b. Up to 3,000 personnel could be engaged in an AT exercise, with international participation limited to five nations per training event.
- c. Training would include the following: day/night extractions; day/night infiltration/evasion/exfiltration training; aircraft refueling; tactical combat maneuvering by fixed- and rotary-wing aircraft; airdrops of personnel and equipment (freefall- and static line-parachute operations from all altitudes); water hoists; and landing on unimproved surfaces. Live fire would be conducted at previously approved target areas at the Barry M. Goldwater Range and existing small arms ranges. Operations would not include construction or ground disturbing activities.
- d. All vehicular ground operations would be conducted using existing paved and unpaved roads.
- e. Depending on location and suitability, operation centers would be set up at one or more forward operating airfields with small tent cities of no more than three or four tents set up to support Command and Control activities. Alternatively, a similar number of conex shipping containers or recreational vehicles may be used to achieve the same objective.

More details on the proposed undertaking and training locations are provided in the enclosed DOPAA (Attachment 1).

5. The USAF has conducted searches of publicly available records, the National Register of Historic Places, and the New Mexico Cultural Resources Information System (NMCRIS). Training locations on DOD facilities are permitted sites that have been previously analyzed and approved for activities similar to the proposed undertaking under a variety of Cultural Resource Management Plans, EAs, and Environmental Impact Statements.

- a. The USAF has identified five sites within 100 m of proposed non-DOD training locations in New Mexico:

AGENCY SITE NUMBER	NRHP ELIGIBILITY	DESCRIPTION	TRAINING LOCATION
33624	Not Eligible	Prehistoric archaeological site with artifacts	Reserve Ranger Station
39974	Eligible	Multicomponent archaeological site with artifacts and features	Reserve Airport
39977	Unevaluated	Prehistoric archaeological site with artifacts	Reserve Airport
70194	Unknown	Prehistoric archaeological site with artifacts and features	Reserve Airport
149438	Eligible	Historic archaeological site with artifacts and features	Reserve Airport

- b. In addition, the Negrito Airstrip and Reserve Airport are historic-age airfields with potential for unrecorded historic facilities.

6. The USAF is concurrently seeking additional information regarding historic properties from the Arizona State Historic Preservation Office and nationally-recognized tribes regarding the properties of interest or concern to them. A list of consulted tribes and a copy of the consultation initiation letter are provided in Attachment 2. Although the Angel Thunder training would also occur at locations in California and Nevada, these would be at permitted DOD sites already governed by the installations' environmental policies and procedures and the USAF is not undertaking Section 106 consultation in these states.

7. Please address questions regarding this consultation to Kevin L. Wakefield at 520-228-4035. Thank you.

Sincerely


For GREGORY S. MARZOLF, Colonel, USAF
Commander

Enclosures:

1. Compact Disc of the Description of the Proposed Action and Alternatives
2. List of tribes invited for government-to-government consultation

Example Request for Concurrence Letter to Agency



DEPARTMENT OF THE AIR FORCE
414TH COMBAT TRAINING SQUADRON (AIR COMBAT COMMAND)
NELLIS AIR FORCE BASE, NEVADA

MEMORANDUM FOR U.S. Fish and Wildlife Service
MR. SCOTT RICHARDSON
SUPERVISORY FISH AND WILDLIFE BIOLOGIST
U.S. FISH AND WILDLIFE SERVICE
ARIZONA ECOLOGICAL SERVICES
201 NORTH BONITA AVENUE, SUITE 141
TUCSON, AZ 85745

FROM: 414 COMBAT TRAINING SQUADRON
3662 Tyndall Ave., Bldg 201
Nellis Air Force Base 89191

SUBJECT: Request for Concurrence with Not Likely to Adversely Affect Threatened and Endangered Species Determination for the *Angel Thunder Personnel Recovery/Rescue Training Exercise* in the Southwestern United States

The U.S. Air Force (USAF) respectfully requests your concurrence on the determination that the biannual Angel Thunder personnel recovery/rescue training exercise may affect, but is not likely to adversely affect the following species: Fickeisen plains cactus (*Pediocactus peeblesianus fickeiseniae*), Gila chub (*Gila intermedia*), headwater chub (*Gila nigra*), roundtail chub (*G. robusta*), razorback sucker (*Xyrauchen texanus*), Chiricahua leopard frog (*Lithobates chiricahuensis*), sonora tiger salamander (*Ambystoma tigrinum stebbinsi*), northern Mexican gartersnake (*Thamnophis eques megalops*), narrow-headed gartersnake (*Thamnophis rufipunctatus*), southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostris yumanensis*), yellow-billed cuckoo (*Coccyzus americanus*), Mexican spotted owl (*Strix occidentalis lucida*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), jaguar (*Panthera onca*), and lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*).

For this consultation, the USAF has integrated the requirements of the National Environmental Policy Act and Endangered Species Act so that all procedures run concurrently. As such, in accordance with 50 CFR Section 402.06(a), USAF intends to have the *Draft EA Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise* stand as the Biological Assessment for threatened and endangered species that could be affected by the project.

The exercise would be primarily centered out of Davis-Monthan Air Force Base, Arizona and would be conducted at locations throughout the southwestern U.S. Specifically, the Proposed Action includes using DoD and non-DoD-owned properties as landing zones and helicopter landing zones, drop zones, ground training and use of various numbers and types of American and foreign aircraft at Davis-Monthan AFB and related training airspace and ranges, and aircraft training sorties. See **Section 2.1** of the EA for a complete description of the proposed action. The DoD-owned and non-DoD owned properties proposed for use are identified in **Table 2-1** (Attachment 1).

The action area is all areas where threatened and endangered species could be directly and indirectly affected by the project. All proposed training areas would range from 0.3 to 2.7 acres in size. It was conservatively assumed that all potential direct and indirect impacts at each training area would be

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confined within a 0.5-mile radius. This would equate to an impact area of 480 acres. This impact area is larger than the size of the sites associated with the Proposed Action and was used for the analysis of direct and indirect effects. All habitat and critical habitat more than 0.5 mile from the proposed sites were eliminated from consideration.

Because of the scope of the project, it is not feasible to conduct an onsite inspection of all areas affected. It is assumed that all ESA-listed species that could potentially occur in the action area would be seasonally present in the appropriate habitat, as described by the EA. **Sections 3.4.2.1** through **3.4.2.5** of the EA provide a literature review of the status of the threatened and endangered species in the action area. **Section 3.4.3.1** of the EA provides a detailed analysis of the potential effects of the project on threatened and endangered species. Effect determinations for these species are summarized in the following tables in the EA and are also attached:

- Southern Arizona U.S. Forest Service (USFS) Sites (Table 3-33)
- Southern Arizona Miscellaneous Sites (Table 3-34)
- Northern Arizona USFS Sites (Table 3-35)
- Northern Arizona Miscellaneous Sites (Table 3-36)
- New Mexico USFS Sites (Table 3-37)

If you have any questions or require additional information, please contact Mr. Kevin Wakefield at (520) 228-4035 or kevin.wakefield.1@us.af.mil.



GREGORY S. MARZOLF, Colonel USAF
Commander

Attachments:

1. Proposed Locations
2. Effect Determinations
3. Draft EA Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise

Scoping Letter Sent to White Mountain Apache THPO



DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA

Colonel Jennifer M. Short
Vice Commander, 355th Fighter Wing
3405 S. Fifth St
Davis-Monthan AFB AZ 85707

Mr. Mark Altaha
Tribal Historic Preservation Officer
White Mountain Apache Tribe
PO Box 1032
Fort Apache, AZ 85926

Dear Mr. Altaha:

REFERENCE: Section 106 Consultation Initiation and Description of the Proposed Action and Alternatives (DOPAA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

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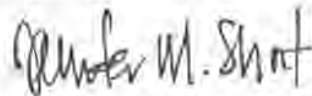
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Please address questions regarding this consultation to Kevin L. Wakefield at 520-228-4035. Thank you.

Sincerely,



JENNIFER M. SHORT, Colonel, USAF
Vice Commander

2 Attachments:

1. Description of the Proposed Action and Alternatives
2. List of Previously Identified Sites

Courtesy copies sent to:

Mr. Ronnie Lupe, Chairman

Mr. Ramon Riley, Cultural Resources Director

Scoping Letters Received



November 7, 2016

SENT VIA EMAIL

Colonel Jennifer M. Short
Vice Commander, 355th Fighter Wing
3405 South Fifth Street
Davis-Monthan Air Force Base
Tucson, AZ 85707

Subject: Description of Proposed Action and Alternatives, Angel Thunder Personnel Recovery/Rescue Training Exercise in Southwestern United States

Dear Colonel Short -

Thank you for the opportunity to provide comments on the USAF Description of Proposed Action and Alternatives (DOPAA) for the *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in Southwestern United States*. The exercise is proposed for a 4-state region of the southwestern US, mainly based out of Davis-Monthan Air Force Base (DMAFB) in Tucson, AZ.

Pima County supports the role of DMAFB in national defense, as well as its contributions regionally and locally. A February 2004 Resolution of the Pima County Board of Supervisors seeks... "to protect the health, safety and welfare of citizens in the Tucson area and maintain a strong collaborative partnership with [DMAFB] to maintain the operational viability of the base" (Resolution 2004-17). The Resolution directed staff to implement recommendations of the DMAFB Joint Land Use Study (JLUS) Compatibility Plan (Jan. 2004) regarding the long-term sustainability of operations at the base, and reducing risks to county residents (e.g., noise, over-flights with live munitions).

Pima County's 2015 Comprehensive Plan update (*Pima Prospers*) includes both Use of Land and Economic Development goals and policies to protect the functionality of DMAFB by preventing encroaching incompatible (mainly residential) development in high noise and accident potential zones. These are reflected in the Pima County Zoning Code, Section 18.57, as permitted and prohibited land uses, and associated safety requirements in the DMAFB environs. Additionally, the Pima County Economic Development Plan, 2015-2017, identifies DMAFB as a significant employer that provides a substantial contribution to the region's economy and the plan provides action items to actively support DMAFB and its mission.

Regarding the proposed training exercise, any changes in types of aircraft being used or quantity of sorties should be compared to and analyzed against the current DMAFB mission. Pima County has created land use and zoning regulations for the DMAFB environs based on the areas of high noise and accident potential of the current mission – these are reflected on the attached map from Pima Prospers (Exhibit 1: DMAFB High Noise and Accident Potential Zones).



Regarding other proposed training activities within Pima County, the DOPAA lists activities that will occur on other public lands (namely, Coronado National Forest and Arizona State Trust Lands – no private lands are proposed) and at miscellaneous facilities in Tucson (University of Arizona Medical Center, Tucson International Airport, Pima Regional Training Center). Most of these facilities and areas are known and easily identified on maps; however, some of the rural sites (e.g., Pond and Sierrita [Map 35] and Ruby Fuzzy Paladins [Map 38]) are more difficult to pinpoint on the DOPAA maps. Additional detail (more detailed maps, site coordinates) for these rural sites would be helpful in providing review of proposed activities, as Pima County manages grazing leases on Arizona State Trust Lands in some of these areas associated with ranches acquired for regional open space.

Pima County Development Services Department, Planning Division looks forward to the draft Environmental Assessment, and will forward and coordinate response from other county departments that may have an interest. Thank you again for the opportunity to provide scoping comments.

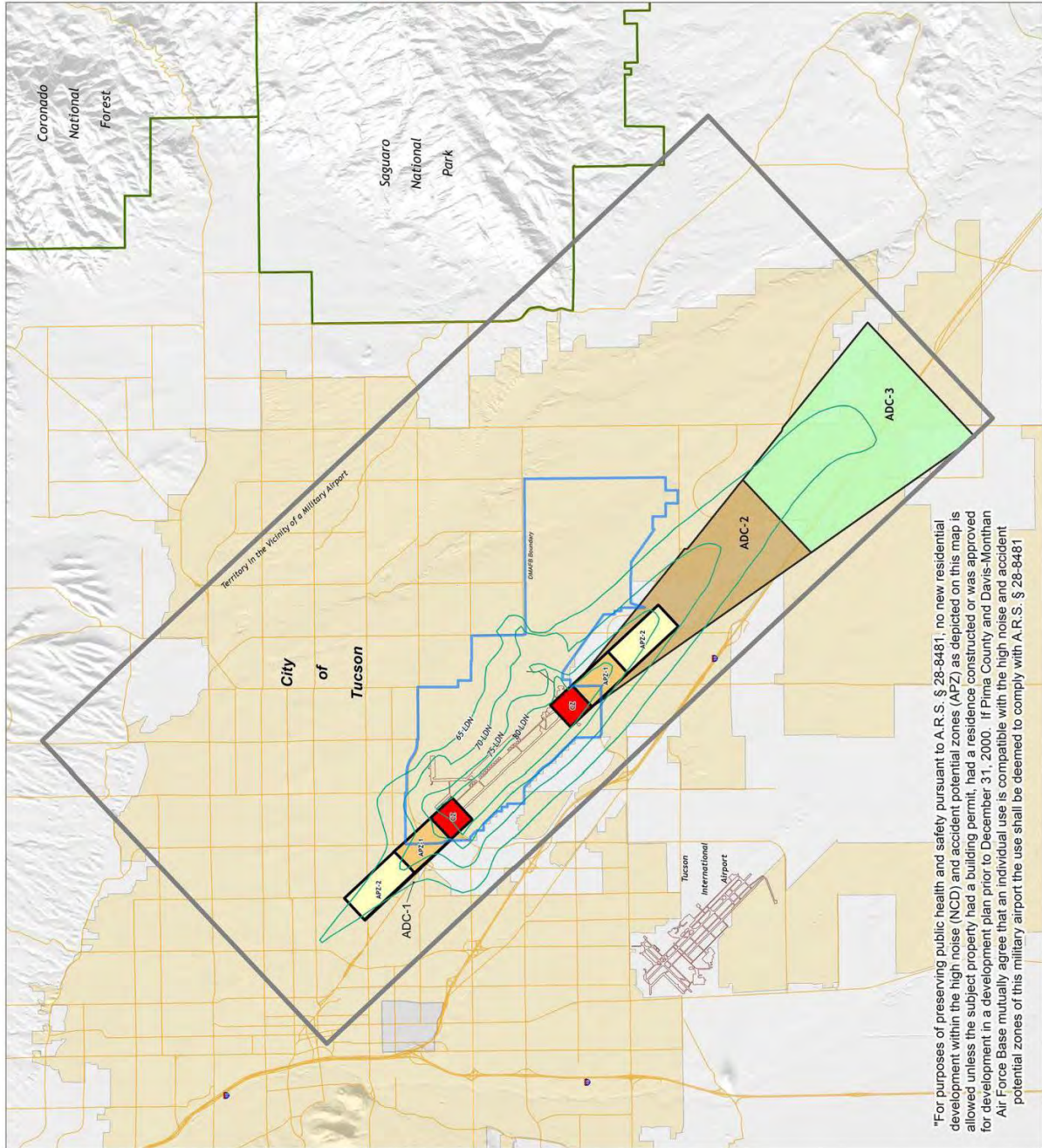
Sincerely,

A handwritten signature in blue ink that reads "Mark Holden". The signature is fluid and cursive, written over the printed name.

Mark Holden, AICP
Principal Planner
Pima County Development Services Department, Planning Division

**Davis-Monthan
Air Force Base
High Noise
and
Accident Potential Zones**

- DMAFB Territory
- DMAFB Base Boundary
- Runways
- Noise Contours 65-80 LDN
- Accident Potential Zone-1
- Accident Potential Zone-2
- Clear Zone
- DMAFB Approach-Departure Corridor 1
- DMAFB Approach-Departure Corridor 2
- DMAFB Approach-Departure Corridor 3
- City of Tucson
- Unincorporated Pima County



"For purposes of preserving public health and safety pursuant to A.R.S. § 28-8481, no new residential development within the high noise (NCD) and accident potential zones (APZ) as depicted on this map is allowed unless the subject property had a building permit, had a residence constructed or was approved for development in a development plan prior to December 31, 2000. If Pima County and Davis-Monthan Air Force Base mutually agree that an individual use is compatible with the high noise and accident potential zones of this military airport the use shall be deemed to comply with A.R.S. § 28-8481."

Exhibit 1: DMAFB High Noise and Accident Potential Zones

GOVERNOR
Susana Martinez



DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Donald L. Jaramillo

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507
Post Office Box 25112, Santa Fe, NM 87504

Tel: (505) 476-8000 | Fax: (505) 476-8123

For information call: (888) 248-6866

www.wildlife.state.nm.us

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THOMAS "DICK" SALOPEK
Las Cruces

23 November 2016

Mr. Kevin Wakefield
AFCEC/CZN
250 Don Goodrich, Bldg. 1650 (ACC NEPA PM)
San Antonio, TX 78236

RE: Angel Thunder Personnel Recovery/Training Exercises; NMDGF No. 17414

Dear Mr. Wakefield:

In response to your 28 October 2016 letter regarding the above referenced project, the New Mexico Department of Game and Fish does not anticipate significant impacts to wildlife or sensitive habitats, with implementation of the applicable mitigation or avoidance measures included within the project description.

Included below are sources of additional information:

1. For Biota Information System of New Mexico (BISON-M) species accounts, searches, and county lists go to bison-m.org.
2. For the Department's Habitat Handbook Project guidelines go to <http://www.wildlife.state.nm.us/conservation/habitat-information/habitat-handbook/>.
3. For custom, site-specific database searches on plants and wildlife go to nhnm.unm.edu, then go to Data, Free On-Line Data, and follow the directions.
4. For state-listed plants contact the New Mexico State Forestry Division at (505) 476-3334 or nmrareplants.unm.edu/index.html.
5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service's Information, Planning, and Conservation website at <http://ecos.fws.gov/ipac/>.

Thank you for the opportunity to comment on your project. If you have any questions, please contact Mark Watson, Habitat Specialist, of my staff at (505) 476-8115, or mark.watson@state.nm.us.

Sincerely,

Chuck L. Hayes, Assistant Chief
Ecological and Environmental Planning Division

cc: USFWS NMES Field Office



Preserving America's Heritage

November 23, 2016

Col. Gregory S. Marzolf
Commander
414 Combat Training Squadron
Department of the Air Force
4430 Grissom Avenue
Nellis Air Force Base, NV 89191

Ref: *Proposed Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States*
Arizona, New Mexico

Dear Col. Marzolf:

The Advisory Council on Historic Preservation (ACHP) has received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and it is determined that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the Arizona and New Mexico State Historic Preservation Offices (SHPO's), and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA, and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the notification of adverse effect. If you have any questions or require further assistance, please contact Ms. Katharine Kerr at 202-517-0216 or via e-mail at kkerr@achp.gov.

Sincerely,

Artisha Thompson
Historic Preservation Technician
Office of Federal Agency Programs



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

REGION V, 555 N. GREASEWOOD ROAD, TUCSON, AZ 85745

GOVERNOR

DOUGLAS A. DUCEY

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DIRECTOR

LARRY D. VOYLES

DEPUTY DIRECTOR

TY E. GRAY



November 29, 2016

Mr. Kevin Wakefield
Base Natural and Cultural Resource Manager EIAP Program Manager
355 CES/CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707

Re: Final DOPAA for Angel Thunder Training Exercise in the Southwestern U.S. – AGFD
Scoping Comments

Dear Mr. Wakefield:

The Arizona Game and Fish Department has reviewed the *Final Description of the Proposed Action and Alternatives* [DOPAA] for an *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States*. As described in the DOPAA, the proposed action is the development of Air Combat Command's biannual Angel Thunder exercise for the recovery and rescue of personnel, to be conducted at various locations on Department of Defense (DOD) and non-DOD owned properties in Arizona, California, Nevada, and New Mexico.

Proposed training sites have been previously disturbed or are currently or previously used for the activities to be conducted under the Proposed Action. Operations will be primarily centered out of Davis-Monthan Air Force Base in Tucson, Arizona. Training would include day and night activities using fixed- and rotary-winged aircraft, vehicular ground operations, airdrops of personnel and equipment, live fire at previously approved target areas and existing small arms ranges, and landing on unimproved surfaces. Operations would not include construction or ground disturbing activities.

After reviewing the Proposed Action, proposed operations sites, Department wildlife data, and discussions amongst Department staff, we have concluded there are no significant wildlife concerns related to the Proposed Action at this time. As your team develops the Environmental Assessment, we encourage your use of the Department's Heritage Data Management System (HDMS)'s On-line Environmental Tool located at <https://azhgis2.esri.com>.

The Department appreciates the opportunity to provide an evaluation of impacts to wildlife or habitat associated with the DOPAA. If you have any questions regarding this letter, please contact me at (520) 388-4447, and visit our website for additional guidelines at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

Sincerely,

A handwritten signature in black ink, appearing to read "Kristin Terpening". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Kristin Terpening
Habitat Specialist, Region V

cc: Laura Canaca, Project Evaluation Program Supervisor

AGFD# M16-11031954



Doug Ducey
Governor

Sue Black
Executive Director



November 23, 2016

Colonel Jennifer M. Short
Vice Commander, 355th Fighter Wing
3405 S. Fifth Street
Davis-Monthan Air Force Base, AZ 85

RE: Angel Thunder Personnel Recovery/Rescue Training Exercise Project; Multiple Counties;
DOD- Davis Monthan; SHPO 2016-1271 (133729)

Attention: Kevin Wakefield, Natural and Cultural Resource Manager

Dear Vice Commander Colonel Short:

Thank you for initiating consultation with our office regarding the above referenced project. Pursuant to 36 C.F.R. Part 800, the implementing regulation for Section 106 of the National Historic Preservation Act we have reviewed the submitted documentation, *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States*, and have the following comments.

1. It is our understanding that the United States Air Force (USAF) is proposing to expand their Air Combat Command's Angel Thunder Personnel Recovery/Rescue Training Exercise centered on Davis-Monthan AFB. We further understand that the exercises associated with this proposed training incorporate multiple states and multiple jurisdictions, including private, state, and federal lands. The proposed project will increase the number of personnel and the frequency of training. Essentially, the project will become biannual, combining training for para-rescue combat aircrews with additional intelligence personnel, battle managers, and joint search and rescue center personnel.
2. Since this project involves coordination of efforts on various federal and state agencies, we assume that Davis Monthan AFB is the lead agency for purposes of Section 106. Please confirm whether this assumption is accurate. Also, we will need to be aware of which agencies will coordinate with you to take the lead, and whether there will be any agencies that will be pursuing their own Section 106 consultation requirements separately.
3. We appreciate that you have begun consultation with Tribes. Please note that all activities within the White Mountain Apache Tribal lands are under the jurisdiction of their THPO and we will defer all comments on those areas to them. As your Tribal consultation continues, please provide us with a comment matrix outlining your efforts.

State Historic Preservation Office

1100 W. Washington St | Phoenix, AZ 85007 | 602.542.4009 | AZStateParks.com

"Managing and conserving natural, cultural, and recreational resources for the benefit of this people, both in our Parks and through our Partners."

4. We appreciate the documentation provided regarding the proposed locations and descriptions of the activities. However, we request that future correspondence provide additional information regarding the relative amount of anticipated ground disturbance created when air dropping equipment and what types of aircraft will be landing on unimproved surfaces.
5. There is a brief mention of access roads in the project description, but the maps do not show access road use. Please provide additional information on access roads, including whether they are existing, any new roads that are anticipated, whether roads are paved or unpaved, any use of vehicles going off existing roads, and whether any roads are proposed to be maintained. We will also be interested to know whether these areas had been previously surveyed for cultural resources, and if there are any existing or known sites that are intersected by the roads.
6. We appreciate that your initial efforts to evaluate the project area included an AZSITE and NRHP literature review. While sites are always important to consider, it is critical to know how much of the proposed project area has been previously inventoried for cultural resources and when the inventories were completed. Table 2-1 has a lot of great information. In Arizona, we request that you include columns that indicate whether the area had been surveyed and references for any previous surveys.

We look forward to receiving more information (much of which is spelled out above) as this project continues. As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, then please do not hesitate to contact me via e-mail, kdobschuetz@azstateparks.gov, or by phone, 602-542-7141.

Sincerely,



Kris Dobschuetz, MA, RPA
Compliance Specialist/Archaeologist
Arizona State Historic Preservation Office



Susana Martinez
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

December 2, 2016

Kevin Wakefield
414th Combat Training Squadron
4430 Grissom Avenue
Nellis Air Force Base, NV 89191

Re: Angel Thunder Training Exercise (HPD log 104644)

Dear Mr. Wakefield,

On behalf of the New Mexico State Historic Preservation Officer (SHPO) I want to thank the Air Force for giving our office the opportunity to review the *Description of the Proposed Action and Alternatives* (DOPAA) for the *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/ Rescue Training Exercise in the Southwestern United States* (EA). I also want to thank you for your quick reply to my telephone call and for providing me with a copy of the *Environmental Assessment for the Playas Training Center, in Hidalgo County, New Mexico* (PTC EA). Although our records show that we received a copy of the Playas EA in 2006, I was unable to locate a copy for review. This letter provides SHPO review comments on the content of the consultation letter and the DOPAA.

I reviewed the information provided in reference to our NCMRIS records, previous Section 106 consultations listed in our tracking system, and land status maps from the New Mexico State Land Office and the Bureau of Land Management. The review focused on areas of potential effect (APEs) in the Gila National Forest, Reserve and Glenwood, and at the Playas Training and Research Center. I did not review APEs that fall within Melrose Air Force Range and White Sands Missile Range. I want to add that NCMRIS records searches in New Mexico extend to 500 meters beyond project APEs, if previously identified properties are illustrated in NMCRIS, and to 1000 meters if no properties are shown. We do this to help obtain objective data to evaluate the probability that unidentified historic properties are in APEs that have not been surveyed.

The next section summarizes the result of the initial review.

Glenwood Ranger Station and heliport has been surveyed for cultural resources and two historic properties are located within 500 meters.

Reserve Ranger Station and Airport, and much of the surrounding areas, have been surveyed for cultural resources. There are a large number of historic properties within 500 meters.

The Catron County Fair Grounds have not been surveyed for cultural resources, as shown in the NMCRIS system. A large number of historic properties have been identified nearby, and a few of these may be on the Fair Grounds property. Additional research may clarify what has been surveyed and what has not. In addition, county property is a subdivision of the state and any additional work must meet state rules.

The Negrito Airstrip has not been surveyed for cultural resources. Much of the area surrounding the Negrito location has been surveyed and a few resources have been identified, but not evaluated. These surveys and documentation may not meet current standards

Negrito Fire Base (and heliport), southwest of the airstrip, has been surveyed for cultural resources and no properties were identified. The survey and documentation may not meet current standards.

The locations for Negrito Helibase, Negrito North, and Negrito South are not precise enough to identify previous surveys and historic properties. Much of the area surrounding the Negrito airstrip has been surveyed, however, and more precise locational information on the APEs and additional records searches may help clarify the undertaking's potential to affect historic properties.

The Rainey Mesa airfield has not been surveyed for cultural resources.

The Playas Research and Training Center (PRTC) and associated "other than American" venues or APE locations (e.g. Ben White, Flores, Playas Airstrip, Playas North, Playas South, Playas East, Playas West, Playas Housing Area, South Village, the off-road driving range) have not been surveyed for cultural resources. The Playas EA indicates that New Mexico Tech owns the Playas town site, but the land status for the other PRTC venues is unclear. Please clarify land status for the Playas area APEs during the development of the EA. In addition, the Playas EA shows that the study was limited to only the Playas Town site and the airport. To the best of my knowledge, the other venues have been subject to neither NEPA nor Section 106 review. We do, however, have records of small Section 106 surveys and consultation near various Playas facilities and venues that are identified as "military trespass". Please consider this during the development of the EA.

Based on our phone call, I understand that the Air Force has contracted a cultural resource consultant to conduct a detailed review of previous research in the project's APE. Please have the consultant coordinate the review with each land managing agency, which may have agency specific review requirements and additional information about cultural resources in their respective areas.

The SHPO is looking forward to working with the Air Force to advance this consultation. We appreciate the Air Forces' commitment to historic preservation while training for its mission to defend our nation. If you have any questions or comments, please feel free to call me directly at 505-827-4225 or you can email me at bob.estes@state.nm.us.

Sincerely,



Bob Estes Ph.D.
HPD staff Archaeologist

From: [WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE](#)
To: [Boyes, David](#); [Frederick, Nicolas](#)
Cc: [KEITH, JUDITH M GS-13 USAF AFMC AFCEC/CZN](#); [WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE](#)
Subject: FW: DOPAA for Angel Thunder Personnel Recovery/Rescue Training Exercise
Date: Thursday, November 10, 2016 3:34:22 PM

Received this today.

Kevin Wakefield
Base Natural and Cultural Resource Manager
EIAP Program Manager
355 CES/CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707
DSN: 228-4035
COMM: (520) 228-4035
Cell: (520) 289-4603

-----Original Message-----

From: Diane Versaggi [<mailto:dversaggi@sanmanuel-nsn.gov>]
Sent: Thursday, November 10, 2016 1:29 PM
To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>
Subject: DOPAA for Angel Thunder Personnel Recovery/Rescue Training Exercise

Dear Mr. Wakefield:

Cultural Resources Management Department for San Manuel Band of Mission Indians (SMBMI) received correspondence from Col. Gregory S. Marzolf dated October 28, 2016, regarding the DOPAA for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States. I am writing today to inform you and the USAF that the above-referenced project exists outside of Serrano ancestral territory and, as such, SMBMI will not be requesting consulting party status under NEPA or requesting to participate in the scoping, development, and/or review of documents created pursuant to these legal and regulatory mandates.

Should you have any questions about the content of this communication, please do not hesitate to contact me at your convenience.

Respectfully,

Diane Versaggi on Behalf of

Lee Clauss

Cultural Resources Management Director

O: (909) 864-8933 x3248

M: (909) 633-5851

lclauss@sanmanuel-nsn.gov <https://owa.sanmanuel.com/owa/redir.aspx?REF=D4Ut_P_FCtq4LYsL4-v0Afr18gUoPoF2BwUJZWGdUHB7FuT6PajTCAftYWlsdG86bGNsYXVzc0BzYW5tYW5lZWwtbnNul.mdvdg..>

26569 Community Center Drive

Highland, CA 92346

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Example Public Draft Tribal Letter



DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA



Colonel Scott C. Campbell
Commander, 355th Fighter Wing
3405 S. Fifth St
Davis-Monthan AFB AZ 85707

Mr. Robert Valencia
Pascua Yaqui Tribe, Chairman
7474 S Camino De Oeste
Tucson, AZ 85757

Dear Mr. Valencia

REFERENCE: Section 106 No Historic Properties Affected Determination and Draft Environmental Assessment for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

1. The U.S. Air Force invited the Pascua Yaqui Tribe to consult on the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States in a letter dated October 28, 2016. As described in that letter, the Angel Thunder training would become a biannual exercise with exercise locations in Arizona, New Mexico, California, and Nevada. We are pleased to provide the *Draft Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States*. The Draft Environmental Assessment (EA), provided as Attachment 1, describes the Proposed Action and alternatives, establishes baseline environmental conditions, and analyzes potential direct, indirect, and cumulative impacts. The Draft EA meets the requirements of the National Environmental Policy Act (NEPA) for evaluation of impacts of a Proposed Action as part of the planning process. After the public review period for the Draft EA ends and all substantive comments have been considered, the USAF will make a determination on the significance of environmental impacts. If the USAF determines that no significant impacts would result from the Proposed Action, then the USAF will approve a Finding of No Significant Impact (FONSI) for the project. The Draft FONSI is provided for review with the Draft EA.

2. In accordance with NEPA and the USAF's implementing regulations, 32 CFR Part 989.14(l), the USAF seeks your input on the proposal's potential environmental impacts as described in the Draft EA. Government-to-government consultation between the USAF and your tribe for this effort is also in accordance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments; Air Force Instruction (AFI) 32-7065, Cultural Resources Management Program; and AFI 90-2002 Air Force Interactions with Federally-Recognized Tribes.

3. In accordance with Section 106 of the National Historic Preservation Act and implementing regulations at 36 CFR 800.4, we have prepared a No Historic Properties Affected Determination for proposed training locations in Arizona (Attachment 2), which incorporates information and comments received

Agile Combat Power

from consulting parties into our analysis of the undertaking's effects on historic properties. The USAF has determined that the undertaking would not affect historic properties in Arizona. As noted in the No Historic Properties Affected Determination, the USAF has not received any information regarding properties of traditional religious or cultural significance; if you wish to submit such information, please do so as soon as possible so that we can take it into account when developing avoidance measures.

4. We request your review of the enclosed No Historic Properties Affected Determination and Draft EA. Please submit your comments within 30 days of receipt of this letter. Please address questions regarding this consultation to Kevin L. Wakefield at 520-228-4035. Thank you.

Sincerely,



SCOTT C. CAMPBELL, Colonel, USAF
Commander

2 Attachments:

1. Compact Disk of the Draft EA and FONSI
2. Angel Thunder Personnel Recovery/Rescue Training Exercise Finding of Effect for Arizona

Courtesy copies sent to:

Ms. Kelly Gomez, Land Use Department

Example Public Draft Agency Letter



DEPARTMENT OF THE AIR FORCE
355TH FIGHTER WING (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA



Colonel Scott C. Campbell
Commander, 355th Fighter Wing
3405 S. Fifth St
Davis-Monthan AFB AZ 85707

Arizona Army National Guard
Florence Military Reservation
Public Affairs Office
5636 East McDowell Road
Phoenix, AZ 85008

To whom it may concern

REFERENCE: Environmental Assessment (EA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

The U.S. Air Force (USAF) has prepared an *Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States* in accordance with the National Environmental Policy Act (NEPA). The EA is provided as Attachment 1 to this letter. The environmental impact analysis process for this proposal is being conducted by the USAF in accordance with the Council on Environmental Quality regulations pursuant to requirements of NEPA.

The USAF is preparing a NEPA analysis for this training based on the proposal to further develop Air Combat Command's Angel Thunder Personnel Recovery (PR)/Rescue Training Exercise. The Angel Thunder training exercise is a large-scale exercise developed in 2006 that is conducted throughout the southwestern United States and primarily centered out of Davis-Monthan Air Force Base (AFB), Arizona. The Angel Thunder training is proposed to become biannual. The biannual exercise would combine PR training for pararescue combat aircrews with training for intelligence personnel, battle managers, and joint search and rescue center personnel.

This proposal would meet the Air Force's responsibilities under Department of Defense Directive (DODD) 3002.01 to ensure PR preparation efforts keep pace with changes in the global operating environment; be prepared to plan and execute PR operations with other interagency partners; and be prepared to conduct interoperable and mutually cooperative PR operations with partner and host nations to rescue Department of Defense (DOD) personnel whenever possible.

In accordance with NEPA and the USAF's implementing regulations, 32 CFR Part 989.14(I), the USAF is also seeking your input on the proposal as described in the enclosed EA. NEPA requirements help ensure environmental information is made available to the public during the decision-making process and prior to actions being taken. A premise of NEPA is that the quality of Federal decisions will be enhanced if the public is involved in the planning process. The Intergovernmental Coordination Act and Executive Order 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider territorial and local views when implementing a Federal proposal. Therefore,

Agile Combat Power

Davis-Monthan AFB is notifying you of the Proposed Action to give you the opportunity to provide comments on the action.

The proposed action consists of updating the biannual three week Angel Thunder training exercise throughout the southwestern U.S., primarily centered out of Davis-Monthan AFB. The Angel Thunder exercise is the largest and most realistic joint service, multinational, interagency Combat Search and Rescue exercise designed to provide training for PR assets using a variety of scenarios to simulate deployment conditions and contingencies. The Proposed Action includes using additional non-Department of Defense (DOD) and non-DOD owned properties desired for use as landing zones and helicopter landing zones; increased numbers and types of American and foreign aircraft at Davis-Monthan AFB and related training airspace and ranges; and an increased number of aircraft training sorties.

- Proposed training sites are on federal, tribal, state, municipal, and private land in areas of New Mexico, Arizona, California, and Nevada that have been previously disturbed or are currently or previously used for the activities conducted under the Proposed Action.
- The biannual training is proposed to normally occur during spring and fall. The first week of an exercise would be for classroom training of support personnel, followed by a 2- to 3-day mobilization period, 10 to 11 days of field training, 1 day of de-mobilization and return to home base.
- Preparation of the environment would occur 5 to 6 times before each exercise for several days at a time. Preparation would primarily consist of site surveys using approximately 10 to 20 personnel to assess the safety of specific locations for intended exercise execution.
- Up to 3,000 personnel could be engaged in an AT exercise, with international participation normally limited to five nations per training event.
- Training would include the following: day/night extractions; day/night infiltration/evasion/exfiltration training; aircraft refueling; tactical combat maneuvering by fixed- and rotary-wing aircraft; airdrops of personnel and equipment (freefall- and static line-parachute operations from all altitudes); water hoists; and landing on unimproved surfaces. Live fire would be conducted at previously approved target areas at the Barry M. Goldwater Range and existing small arms ranges. Operations would not include construction or ground disturbing activities.
- All vehicular ground operations would be conducted using existing paved and unpaved roads.
- Depending on location and suitability, operation centers would be set up at one or more forward operating airfields with a few tents set up to support Command and Control activities. Alternatively, a similar number of conex shipping containers or recreational vehicles may be used to achieve the same objective.

More details on the proposed action and training locations are provided in the enclosed EA (Attachment 1).

Public comments must be submitted in writing by (insert month and date), either via e-mail to 355fw.pa.comment@us.af.mil, or by mail to: ATTN: ANGEL THUNDER EA COMMENT, 355th Fighter Wing Public Affairs, 3405 S Fifth Street, Davis-Monthan AFB, Arizona 85707. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "SCC", is written over the printed name.

SCOTT C. CAMPBELL, Colonel, USAF
Commander

Attachment: Compact Disc of the EA for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States

Tribal Comment Letters Received

AK-CHIN INDIAN COMMUNITY

Community Government

42507 W. Peters & Nall Road • Maricopa, Arizona 85138 • Telephone: (520) 568-1000 • Fax: (520) 568-1001



March 06, 2017

Colonel Scott C. Campbell
Commander, 35th Fighter Wing
3405 S. Fifth Street
Davis-Monthan AFB, AZ. 85707

Re: Section 106 No Historic Properties Affected Determination and Draft Environmental Assessment for the Angel Thunder personnel Recovery/Rescue Training Exercise in the Southwestern United States.

Dear Sir,

The Ak-Chin Indian Community did receive your letter on March 03, 2017 regarding the United States Air Force Draft Environmental Assessment (EA) that describes the Proposed Action and alternatives, establishes baseline environmental conditions, and analyzes potential direct, indirect, and cumulative impacts of the Angel Thunder Personnel Recovery/Rescue Training Exercises that would become a biannual exercise with exercise locations in Arizona, New Mexico, California, and Nevada.

We also receive a copy of the *Draft Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States* for our review. Thank you for enclosing the copy for our review.

At this time, due to the project location, we will defer all comments and concur with the Tohono O'odham Nation Tribal Historic Preservation Office located in Sells, Arizona.

If you should have any questions, please contact Ms. Bernadette Carra CRS-Land Management at (520) 568-1337 or Mrs. Caroline Antone, Cultural Resources Manager at (520) 568-1372. Thank you.

Sincerely,

Robert Miguel, Chairman
Ak-Chin Indian Community



White Mountain Apache Tribe

Office of Historic Preservation

PO Box 1032

Fort Apache, AZ 85926

Ph: (928) 338-3033 Fax: (928) 338-6055

To: Scott C. Campbell, Colonel, USAF Commander
Date: March 13, 2017
Re: Draft Environmental Assessment for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States

.....

The White Mountain Apache Tribe Historic Preservation Office appreciates receiving information on the proposed project, dated March 02, 2017. In regards to this, please attend to the following checked items below.

Please refer to the additional notes in regards to the proposed project:

Thank you for allowing the White Mountain Apache tribe the opportunity to review and respond to the above draft EA for the proposed Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United State, two of which are located on the Fort Apache Indian Reservation, in east-central Arizona's Salt River Canyon, and we have determined the Recovery and Rescue Training Exercise **will not have an impact** on the White Mountain Apache tribe's historic properties and/or traditional cultural properties.

Regardless, any/all ground disturbing activities should be monitored "if" there are reasons to believe that there are human remains and/or funerary objects present, and if such remains are encountered they shall be treated with respect and handled accordingly until such remains are repatriated to the affiliated tribe(s).

Thank you. We look forward to continued collaborations in the protection and preservation of places of cultural and historical importance.

Sincerely,

Mark T. Altaha - THPO

White Mountain Apache Tribe - THPO

WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE

From: Chris Coder <ccoder@yan-tribe.org>
Sent: Tuesday, March 14, 2017 3:10 PM
To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE
Cc: Gertrude Smith, YavapaiCulture
Subject: ANGEL THUNDER

Hi Kevin,

Salutations.

As per our phone conversation, the Yavapai-Apache Nation (YAN) has NO comments or concerns regarding the Draft EA for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States project. You can consider this as our response to you obligations to consult under Section 106.

Culturally yours,

Chris Coder

Tribal Archaeologist

YAN, Camp Verde, AZ 86322

AGUA CALIENTE BAND OF CAHUILLA INDIANS

Tribal Historic Preservation



01-022-2016-001

March 17, 2017

[VIA EMAIL TO: kevin.wakefield.1@us.af.mil]
United States Air Force
Mr. Kevin L. Wakefield
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707

Re: Section 106 Consultation for the Angel Thunder Personnel Recovery/Rescue Training Exercise

Dear Mr. Kevin L. Wakefield,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the Angel Thunder Personnel Recovery/ Rescue Training Exercise project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area (TUA). For this reason, the ACBCI THPO requests the following:

* Since all locations in California are within previously approved areas on military installations the ACBCI THPO has no concerns.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760)699-6828. You may also email me at hfeeney@aguacaliente.net.

Cordially,

Hannah Feeney
Archaeological and Archives Technician
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

3001 HINDS ROAD, SUITE 100, PALM SPRINGS, CA 92264
TEL: 760/699-6828 FAX: 760/699-6829

Frederick, Nicolas

From: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>
Sent: Monday, April 3, 2017 3:31 PM
To: Boyes, David; Frederick, Nicolas
Cc: DIVINE, ROBIN D CIV USAF AFMC AFCEC/CZN; WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE
Subject: FW: Angel Thunder EA and Section 106 Consultation Request

Received the following request for additional information from the Campo Band of Mission Indians.

Kevin Wakefield
Base Natural and Cultural Resource Manager EIAP Program Manager
355 CES/CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707
DSN: 228-4035
COMM: (520) 228-4035
Cell: (520) 289-4603

-----Original Message-----

From: Marcus Cuero [mailto:MarcusCuero@campo-nsn.gov]
Sent: Monday, April 03, 2017 8:24 AM
To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>
Subject: RE: Angel Thunder EA and Section 106 Consultation Request

Do you have more information regard cultural surveys on the proposed California military installations? If there are cultural resources that are impacted we would like to know. I would like more information before Campo writes a letter.

-----Original Message-----

From: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE [mailto:kevin.wakefield.1@us.af.mil]
Sent: Monday, March 20, 2017 3:08 PM
To: Marcus Cuero
Cc: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE
Subject: RE: Angel Thunder EA and Section 106 Consultation Request

Hi Marcus, here is the draft letter that was sent out to the tribes.

We have also received comments back from the CA SHPO, I have attached those as well.

Kevin Wakefield
Base Natural and Cultural Resource Manager EIAP Program Manager
355 CES/CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707

DSN: 228-4035
COMM: (520) 228-4035
Cell: (520) 289-4603

-----Original Message-----

From: Marcus Cuero [mailto:MarcusCuero@campo-nsn.gov]
Sent: Monday, March 20, 2017 2:57 PM
To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>
Subject:

Thank you for the call today. Could you please email me the draft letter that would be great. I will keep an eye out for the EIS. Thank you and have a great day.

-----Original Message-----

From: Peter Steere [<mailto:Peter.Steere@tonation-nsn.gov>]

Sent: Thursday, April 06, 2017 11:10 AM

To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>

Subject: [Non-DoD Source] RE: Angel Thunder Exercise Section 106 Consultation

MEMORANDUM

DATE: April 13, 2017

TO: Kevin Wakefield

Base Natural and Cultural Resource Manager Davis-Monthan AFB

FROM: Peter L. Steere, THPO, Tohono O'odham Nation

RE: Angel Thunder Personnel Recovery Rescue Training Exercise in the Southwestern United States

The Tribal Historic Preservation Office of the Tohono O'odham Nation concurs that a "No Historic Properties Affected" determination for the Angel Thunder Personnel Recovery Rescue Training Exercise in the Southwestern United States is appropriate.

-----Original Message-----

From: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE [<mailto:kevin.wakefield.1@us.af.mil>]

Sent: Thursday, March 23, 2017 6:37 AM

To: Peter Steere

Cc: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE

Subject: FW: Angel Thunder Exercise Section 106 Consultation

Mr. Steere, here is a copy of the letter that was sent to you.

Kevin

Kevin Wakefield

Base Natural and Cultural Resource Manager EIAP Program Manager

355 CES/CEIE

3775 S. Fifth Street

Davis-Monthan AFB, AZ 85707

DSN: 228-4035

COMM: (520) 228-4035

Cell: (520) 289-4603

-----Original Message-----

From: Lee Clauss [<mailto:L.Clauss@sanmanuel-nsn.gov>]

Sent: Sunday, April 09, 2017 11:47 PM

To: WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>

Subject: [Non-DoD Source] DEA and FONSI for the Angel Thunder Training Exercise--SMBMI Resposne

Dear Mr. Wakefield,

Thank you for contacting the Cultural Resources Management Department of the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Department on March 6, 2017. By this e-mail, SMBMI wishes to inform the USAF, 414th Combat Training Squadron, that the proposed training exercises will occur outside of Serrano ancestral territory, and therefore, SMBMI does not require consultation on this undertaking, nor do we possess any information that would supplement or contradict the content of the Draft EA or the Draft Finding of No Significant Impact (FONSI).

Should you require any additional information or clarification regarding the comments provided in this e-mail, please do not hesitate to follow-up with me at your convenience.

Respectfully,

Lee Clauss

San Manuel Band of Mission Indians

Cultural Resources Management Department

Cultural Resources Management Director

O: (909) 864-8933 x3248

M: (909) 633-5851

lclauss@sanmanuel-nsn.gov <https://owa.sanmanuel.com/owa/redir.aspx?REF=D4U1_P_EC1q41YsL4-y0AfR18gUoPof2f3wUJZWGdUHB7FuT6PajTCAFiYWJsdG86bGNsYXVze0BzYW5tYCW51ZWwtbnNuf.mdvde...>

26569 Community Center Drive

Highland, CA 92346

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UNITED STATES AIR FORCE
355 CES / CEIE
3775 S. Fifth Street
Davis-Monthan AFB, AZ 85707



"Engineers Lead the Way"

Facsimile Transmittal

To: Chairman Damon R. Clarke FAX: (928) 769-2343
Hualapai Indian Tribe of the Hualapai Indian Reservation
From: Kevin Wakefield Date: 17 April 2017

Re: Angel Thunder Exercise Section 106 Consultation

This Facsimile Transmittal is a follow-up on the Angel Thunder Personnel Recovery/Rescue Training Exercise Section 106 Consultation request that was mailed out on/or about 3 March 2017. The public comment period has ended and the Air Force is in the process of finalizing the EA. The United States Air Force would like to hear from the tribe if they have any concerns or comments. Any comments provided will be included in the Final EA in the Section 106 Section. The Air Force would also appreciate a response from the tribe if you have no concerns or comments so we can complete the consultation process.

Respectfully,

Kevin Wakefield
EIAP Program Manager
355th Civil Engineer Squadron
Kevin.wakefield.1@us.af.mil
(520) 228-4035 / Office

17 Apr 2017/09:09
Received phone message from
Chairman Clarke, "the Hualapai Tribe
has no concerns or comments at
this time."

4/17/2017
Kevin Wakefield
[Signature]

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DD FORM 2056, MAY 2000 PREVIOUS EDITION MAY BE USED



Received from Tribal Admin 4/20/17

E-mailed 4/20/17 ysp

Signed 4/20/17 ysp

SAN CARLOS APACHE TRIBE
Historic Preservation & Archaeology Department
P.O. Box 0
San Carlos Arizona 85550
Tel. (928) 475-5797, apachevern@yahoo.com

Tribal Consultation Response Letter

Date: March 29, 2017

Contact Name: Kevin Wakefield, kevin.wakefield.1@us.af.mil

Company: Department of the Air Force, 355th Fighter Wing (ACC)

Address: 3405 S. Fifth Street, Davis-Monthan AFB AZ 85707

Project Name/#: Draft E.A. for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States

Dear Sir or Madam:

Under Section 106 and 110 of the National Historic Preservation Act, we are replying to the above referenced project. Please see the appropriate marked circle, including the signatures of Vernelda Grant, Tribal Historic Preservation Officer (THPO), and the concurrence of the Chairman of the San Carlos Apache Tribe:

☐ **NO INTEREST/NO FURTHER CONSULTATION/NO FUTURE UPDATES**

We defer to the Tribe located nearest to the project area.

☒ **CONCURRENCE WITH REPORT FINDINGS & THANK YOU**

☒ **REQUEST ADDITIONAL INFORMATION**

I require additional information in order to provide a finding of effect for this proposed undertaking, i.e.

Project description ___ Map ___ Photos ☒ Other *Concurrence report but also support*

☐ **NO EFFECT** *any tribes that may have concerns regarding sites & topics*

I have determined that there are no properties of religious and cultural significance to the San Carlos Apache Tribe that are listed on the National Register within the area of potential effect or that the proposed project will have no effect on any such properties that may be present.

☐ **NO ADVERSE EFFECT**

Properties of cultural and religious significance within the area of effect have been identified that are eligible for listing in the National Register for which there would be no adverse effect as a result of the proposed project.

☐ **ADVERSE EFFECT**

I have identified properties of cultural and religious significance within the area of potential effect that are eligible for listing in the National Register. I believe the proposed project would cause an adverse effect on these properties. Please contact the THPO for further discussion.

We were taught traditionally not to disturb the natural world in a significant way, and that to do so may cause harm to oneself or one's family. Apache resources can be best protected by managing the land to be as natural as it was in pre-1870s settlement times. Please contact the THPO, if there is a change in any portion of the project, especially if Apache cultural resources are found at any phase of planning and construction. Thank you for contacting the San Carlos Apache Tribe, your time and effort is greatly appreciated.

DIRECTOR/THPO:

Vernelda J. Grant
Vernelda J. Grant, Tribal Historic Preservation Officer

04/02/2017
Date

CONCURRENCE:

Terry Rambler
Terry Rambler, Tribal Chairman

4/12/17
Date



GILA RIVER INDIAN COMMUNITY

POST OFFICE BOX 2193, SACATON, AZ 85147

TRIBAL HISTORIC PRESERVATION OFFICE

(520) 562-7162
Fax: (520) 562-5083

April 24, 2017

Colonel Scott C. Campbell, Commander
Department of the Air Force
355th Fighter Wing (ACC)
3405 S. Fifth Street
Davis-Monthan Air Force Base, Arizona 85707

RE: Section 106 Findings of Effect and Draft Environmental Assessment (EA) for the Angel Thunder Personnel Recovery/Rescue Training, Southwestern United States, Davis Monthan Air Force Base (DMAFB), Tucson, Arizona

Dear Colonel Campbell,

The Gila River Indian Community Tribal Historic Preservation Office (GRIC-THPO) has received your consultation documents via electronic mail on April 24, 2017. The draft EA describes a DMFAP undertaking to conduct biannual Angel Thunder (AT) training throughout the southwestern United States. AT training includes the use of Department of Defense (DoD) and non-DoD properties landing zones (LZs), helicopter landing zones (HLZs), drop zones (DZs), forward aircraft refueling points (FARPs), military operations in urban terrain (MOUT), and use of American and foreign aircraft at DMAFB. A total of 142 DoD and non-DoD properties would be used in the exercise. Of the 142 properties to be used, 113 of the properties are within Arizona. Non-DoD properties are located on Forest Service lands, tribal lands, state lands, county lands, municipal lands, and private lands. Each of the training, landing, and drop zones are 100 meters in diameter.

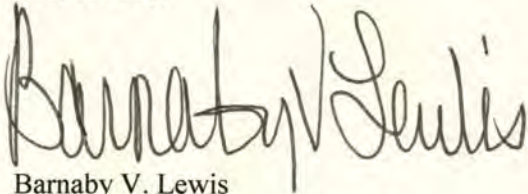
A Class I records overview has been conducted for the various DoD and non-DoD properties. A total of 35 sites were identified within the Arizona properties. The DMAFB has made a finding of adverse effect for three unrecorded architectural historic properties, no adverse effect for three properties, and no effect for 28 historic properties. DMFAB will avoid the unrecorded architectural features. The DFMAFB will prepare a Programmatic Agreement (PA) in accordance with Advisory Council on Historic Preservation guidance to resolve and mitigate any adverse effects the training exercise could have upon historic properties which may be eligible for listing on the National Register of Historic Places.

The GRIC-THPO requests additional information about the proposed findings of effect. A finding of adverse effect is presented, a finding of no adverse effect presented, and a finding of no effect is presented. While we understand the proposed findings of effect in regards to this undertaking, we also have reviewed a letter concurring with a finding of no historic properties affected from the Tohono O'odham Nation THPO (April 13, 2017). There is no mention of recommendation for the preparation of a PA. Is that still the goal of the DMAFB to write a PA? Please provide clarification regarding findings of effect and the proposed Section 106 objectives for this undertaking. Perhaps the GRIC-THPO and the TON-THPO have reviewed different "packages."

Again, we request clarification. The GRIC-THPO will continue to participate in the Section 106 consultation for this undertaking. The proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation).

Thank you for contacting the GRIC-THPO about this undertaking. If you have any questions please do not hesitate to contact me or Archaeological Compliance Specialist Larry Benallie, Jr. at 520-562-7162.

Respectfully,

A handwritten signature in dark ink, appearing to read "Barnaby V. Lewis". The signature is fluid and cursive, with the first name "Barnaby" being more prominent and the last name "Lewis" following in a similar style.

Barnaby V. Lewis
Tribal Historic Preservation Officer
Gila River Indian Community

Agency Comment Letters Recieved

Substantive comments provided on the Public Draft EA are noted with comments that indicate the section of the document where they have been addressed.

GOVERNOR
Susana Martinez



DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Donald L. Jaramillo

STATE OF NEW MEXICO DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507

Post Office Box 25112, Santa Fe, NM 87504

Tel: (505) 476-8000 | Fax: (505) 476-8123

For information call: (888) 248-6866

www.wildlife.state.nm.us

STATE GAME COMMISSION

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Roswell

THOMAS "DICK" SALOPEK
Las Cruces

13 March 2017

ATTN: Angel Thunder EA Comment
355th Fighter Wing Public Affairs
3405 S. Fifth St.
Davis-Montham AFB, AZ 85707

**Re: *Angel Thunder Personnel Recovery/Training Exercises Environmental
Assessment NMDGF Doc. No. 17639***

Dear Sirs:

The Department of Game and Fish (Department) has reviewed the above-referenced project. The Department does not anticipate adverse effects to wildlife or important wildlife habitats from implementation of this project.

We appreciate the opportunity to comment on this project. Should you have any questions regarding these comments, please contact Mark Watson, Habitat Specialist, of my staff at (505) 476-8115 or mark.watson@state.nm.us.

Sincerely,

Chuck L. Hayes, Assistant Chief
Ecological and Environmental Planning Division

cc: USFWS NMES Field Office



March 14, 2017

Mr. Scott C. Campbell, Colonel, USAF Commander
ATTN: Angel Thunder EA Comment
355th Fighter Wing Public Affairs
3405 S. Fifth Street
Davis-Monthan AFB
Tucson, Arizona 85707
355fw.pa.comment@us.af.mil

Subject: Environmental Assessment for the Angel Thunder Personnel
Recovery/Rescue Training Exercise in the Southwestern United States

Dear Colonel Campbell:

We appreciate the opportunity to review the draft Environmental Assessment (EA) for the above referenced proposed action. Based upon our review, we have no comments to share at this time.

As the region's federally designated metropolitan planning organization, Pima Association of Governments (PAG) oversees long-range transportation planning and short-range transportation programming activities for the region. PAG also provides regional coordination for air and water quality related activities, among others. PAG members include the Cities of South Tucson and Tucson, the Towns of Marana, Oro Valley and Sahuarita, Pima County, the Pascua Yaqui Tribe, and the Tohono O'odham Nation. Our governing board also includes the Governor-appointed Pima County representative of the Arizona State Transportation Board who votes on transportation matters only.

Thank you again for the opportunity to review the draft EA. Should you have any questions, please do not hesitate to call me at (520) 792-1093.

Sincerely,

Cherie Campbell
Deputy Director

**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov



March 20, 2017

Reply in Reference To: USAF_2017_0302_001

Gregory S. Marzolf, Colonel, USAF
Commander
414th Combat Training Squadron (Air Combat Command)
Nellis Air Force Base, Nevada

Re: Section 106 Consultation for Angel Thunder Personnel Recovery and Rescue
Training Exercise, Southwestern United States

Dear Commander Marzolf:

The United States Air Force (USAF) is initiating consultation regarding their effort to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800.

The USAF is proposing to conduct a bi-annual training exercise identified as Angel the Thunder Personnel Recovery and Rescue Training program. Currently the exercises are conducted throughout the southwestern United States and the USAF is proposing to expand the training area into the following California Department of Defense properties:

1. Naval Weapons Air Station, Seal Beach
2. March Air Reserve Base
3. Marine Corps Base Camp Pendleton
4. San Nicolas Island
5. San Clemente Island
6. Naval Base Coronado
7. Naval Air Facility El Centro

As the lead federal agency, the USAF contacted cultural resources management staff at the subject installations to confirm that all proposed training will occur in approved training areas. As these seven sites are currently used for similar training maneuvers and no NRHP listed or eligible sites have been identified in the proposed areas, the USAF is requesting SHPO concurrence with their determination of no historic properties affected. After reviewing the information provided, SHPO concurs with this finding of effect. Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, the USAF may have future responsibilities for this undertaking under 36 CFR Part 800.

March 20, 2017
Colonel Gregory S. Marzolf
Page 2

USAF_2017_0302_001

If you have any questions or concerns, please contact SHPO Historian Ed Carroll at (916) 445-7006 or Ed.Carroll@parks.ca.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Julianne', with a horizontal line extending to the right.

Julianne Polanco
State Historic Preservation Officer



State of New Mexico
ENVIRONMENT DEPARTMENT

Office of the Secretary

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

Springer Square
121 Tijeras Avenue, NE, Suite 1000
Albuquerque, NM 87102-3400
Telephone (505) 222-9500 Fax (505) 222-9510
www.env.nm.gov



BUTCH TONGATE
Cabinet Secretary Designate

J. C. BORREGO
Acting Deputy Secretary

March 22, 2017

Colonel Gregory S. Marzolf
Commander, 414 Combat Training Squadron
3662 Tyndall Ave., Building 201
Nellis Air Force Base, NV 89191

Email: 355fw.pa.comment@us.af.mil

Re: Environmental Assessment for the Angel Thunder Personnel Recovery/Rescue Training
Exercise in the Southwestern United States
NMED EIR #5430

Colonel Marzolf:

Staff from the New Mexico Environment Department (NMED) reviewed the Environmental Assessment (EA) documentation for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States.

Proposed training sites in New Mexico are described as previously disturbed; previously or currently used for the activities described; and, include the use of existing paved and unpaved roads. The activities described in the EA are not likely to negatively impact surface or ground water quality in the areas identified and no significant environmental impact is anticipated.

Thank you for the opportunity to comment on this proposed action. If you have any questions, please contact me at (505) 222-9552 or by email at thomas.skibitski@state.nm.us.

Sincerely,

Thomas Skibitski
Environmental Impact Review Coordinator

NMED File Number: EIR #5430

Email: 355fw.pa.comment@us.af.mil



United States
Department of
Agriculture

Forest
Service

Coconino National Forest
Supervisor's Office

1824 South Thompson Street
Flagstaff, AZ 86001
928-527-3600
Fax: 928-527-3620

File Code: 1950; 2710
Date: March 31, 2017

Ms. Robin Divine
ACC NEPA PM
AFCEC/CZN
2261 Hughes Avenue, Suite 155
JB SA Lackland, TX 78236-9853

Dear Colonel Jennifer L. Kilbourn,

We have recently noticed the release of the Draft Environmental Assessment (EA) Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise, and are writing to submit comments for consideration during the 30-day comment period.

Our primary concern is that there has been very little or no coordination with the Coconino National Forest for the activities discussed in the EA as part of its development and publication. As a result, a final decision based on this EA will still require additional analysis and approval for the proposed training activities by the Coconino National Forest before these activities can be authorized through the issuance of a special use permit. In particular, we are concerned that the analysis lacks information on whether the proposed activities would be in conformance with the agency NEPA requirements, or the Coconino National Forest land and resource management plan standards and guidelines.

Our understanding based on the 1988 Master Agreement Between Department of Defense and Department of Agriculture is that the USAF may be the lead agency in NEPA analysis given the agency is involved throughout the process and included, "in the initial planning stages of activities proposed on National Forest System lands." Our concern is that there has been very little coordination and communication regarding this proposal, and as a result a decision on the EA will not meet Forest Service planning requirements, or possibly Forest Plan requirements. After reviewing the EA, it appears the EA lacks the documentation and detail necessary to directly result in the approval of a special use authorization for the identified training exercises. However, based on interagency cooperation, we have successfully expedited NEPA and the special use authorization process in the past for these types of training exercises on an annual basis. It is our determination that additional NEPA analysis would need to continue on an annual basis to authorize special use authorizations for activities on the Coconino National Forest identified in the EA in the future.

The Coconino National Forest reviewed and approved a special use permit for activities associated with Angel Thunder exercises planned to occur in 2016. The Forest is in the process of issuing a permit for activities in 2017. We feel that given the current general nature of the proposal, the same specifications and design criteria included in the 2016 permit should apply to the proposal to implement Angel Thunder exercises on the Coconino National Forest in future years. Please see the attached 2016 permit. However, an application or submittal of details of



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annual activities and locations would be required well enough in advance to do screen proposed activities with the forest plan direction, complete any needed analysis and prepare the permit.



After reviewing the proposed action, we have identified a number of issues or concerns based on the locations and types of training activities to occur. These issues or concerns include:

- Noise impacts near listed and sensitive species areas, population centers or developed sites (campgrounds, popular trails and trailheads) may be an issue depending on how many landings are planned at the site and what types of aircraft are used. For example, the Rough Rider HLZ is close to the Village of Oak Creek and there is a public sensitivity to low flying aircraft in the Sedona community and Sedona Airport.
- If routes that provide access to popular recreation sites are planned for use (e.g. Snowbowl Road, Forest Road 525, etc.) it would be appropriate to notify forest visitors with signage or other appropriate safety accommodations to reduce unnecessary hazards.
- The Forest has a number of sensitive wildlife areas (such as, Mexican spotted owl, Northern goshawk, yellow-billed cuckoo, southwest willow flycatcher) where helicopter use should be avoided. For example, low-altitude helicopter use should be avoided within ¼ mile of Mexican spotted owl Protected Activity Centers during the breeding season, which is March 1 through August 31.
- There is management direction to restrict/ prohibit use of trails for motorized activities, especially National Scenic Trails (AZ Trail and General Crook).
- Advance notification of activities to allow for signage, temporary closure, or other appropriate safety measures associated with roads/trails in activity areas, if necessary.
- There are concerns with the proposed use of the Long Valley Admin Site. This location regularly sees heavy recreational use in Spring through Fall, including the month of May. It is also a location that is permitted for large group events. Landing helicopters in the meadow adjacent to the recreation site will likely result in impacts to recreational users at this location. This location also includes a number of historic structures protected under the National Historic Preservation Act. Since this area is not usually used as a helitack base and using it this way could result in impacts to historic structures as well as tree removal, which would result in impacts to other resources such as scenery, wildlife, etc.
- Any activities and permits would need to be subject to any fire restrictions or fire closures.
- Water hoists may be concern related to the City of Flagstaff's water sources. In addition, equipment used for water hoists will need to address potential cleaning to avoid introduction of invasive species and diseases.

In addition to the specifications in the 2016 special use authorization (which appears to include slightly different locations and plans than in the proposed action being analyzed), we would suggest the following conditions be applied to Angel Thunder exercises on the Coconino National Forest:

- General Crook Location is immediately adjacent to two Mexican spotted owl PACs that are on the Tonto National Forest. No activities would be allowed with 0.25 mile of those PACs (which includes the point provided) during the breeding season (March 1 – August 31st). There is also a peregrine nest ~0.8 mile to the west of the point provided, so the travel paths of flights would need to stay 0.5 mile from the nest during the breeding season (March 1st – August 15th). 
- Jacks Canyon location – there is a MSO PAC and a peregrine nest ~1.0 mile southwest of the coordinates provided for this location. While activities at the location would not have a timing restriction, the travel path of flights would need to stay 0.25 mile from the PAC and 0.5 mile from the peregrine nest during their respective breeding seasons.
- There are other sensitive species in addition to MSO, such as Northern goshawk, bald eagle roosts and cuckoo that would need to be analyzed and timing restrictions or flight paths considered for some locations. (i.e. goshawk near the Hotshot Ranch and eagle roosts near Mormon Lake Guard Station.) 
- All vehicular activity will occur on existing paved and unpaved, designated roads. No off road vehicular activity is proposed.
- Roads closed (and gated) to the public for wet weather conditions or for other purposes (we have several forest roads that have been gated or ‘decommissioned’ to discourage unauthorized motor vehicle use) should also apply to the Angel Thunder operations.
- The “Comanche” drop zone appears to be located in the North Coulter pasture of the Casner Park/Kelly Seep allotment (east of the 700 Rd. near Ward Camp Tank); active allotment and grazed most summers. Apparently this site has been used in the past and we haven’t heard any concerns from the grazing permittee so assume no issues. It would be helpful to get advanced notification if the proposed activities occur between June 1 and October 31. There is the possibility that livestock may be present within the Elk or Comanche drop zones.

Thank you for the opportunity to review this proposed action. As I previously mentioned, in previous years we have been able to work closely with the DOD to expedite NEPA review of Angel Thunder activities to issue a short-term special use authorization for specifically identified training activities (please see enclosed special use authorization). The enclosed comments include the issues we would consider prior to issuing a special use authorization for implementation of the training activities identified in the Draft EA.

Number: 1 Author: NFREDERI Subject: Sticky Note Date: 4/27/2017 11:39:06 AM
 The Mogollon Rim (General Crook) and Jack's Canyon location conditions for the peregrine falcon have been added to Section 4.4.1.2, U.S. Forest Service subsection, paragraph 5.
 The Mogollon Rim (General Crook) and Jack's Canyon location conditions for the Mexican spotted owl have been added to Section 4.4.1.2, U.S. Forest Service subsection, paragraph 13.

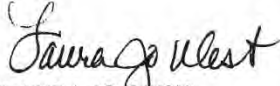
Number: 2 Author: MSHELBY Subject: Sticky Note Date: 4/27/2017 11:39:10 AM
 Potential biological restrictions for the Flagstaff Hotshot (Hotshot Ranch) and Mormon Lake locations are included in Section 5.3, Table 5-2 under "Northern Arizona - USFS."

Ms. Robin Divine

4

We would like to discuss the proposed activities in more detail and identify a clear, predictable process for reviewing and authorizing these activities in the future. Please contact Bridget Roth, Public Lands Staff Officer, at 928-527-3470 or broth@fs.fed.us.

Sincerely,

A handwritten signature in black ink, reading "Laura Jo West". The signature is written in a cursive, flowing style.

LAURA JO WEST
Forest Supervisor

cc: Judy Adams, Lisa Mizuno, Sur Farley, Mike Elson, Debra Mollet, Polly Haessig, Linda Wadleigh, Michael Duncan, Jessica Richardson, Nicole Branton, Steve Martinet, Elizabeth Munding

Authorization ID: COC0541
Contact ID: DEPT_OF_DEFENSE
Expiration Date: 06/13/2015
Use Code: 431

FS-2700-25 (01/2014)
OMB NO. 0596-0082

**U.S. DEPARTMENT OF AGRICULTURE
Forest Service
TEMPORARY SPECIAL - USE PERMIT
(FSH 2709.11, sec. 53.13a)
AUTHORITY:
ORGANIC ADMINISTRATION ACT June 4, 1897**

UNITED STATES AIR FORCE, hereinafter called the Holder, is hereby authorized to use, subject to the terms and conditions of this permit, National Forest System land identified within the unit area and described as Sec. 27, T. 18 N., R. 9 E., GILA AND SALT RIVER MERIDIAN, as shown on the attached Exhibit(s) 1 and 2 and Appendix A and B. This authorization covers approximately 25000 acres.

The holder is authorized to conduct the following activities and/ or install the following temporary improvements on the permitted area on lands administered by the Coconino National Forest:

ANGEL THUNDER is the National Personnel Recovery Exercise for the United States which provides for Non-Conventional Assisted Recovery actions during military exercise utilizing Air Force and local law enforcement officers. This exercise provides for recovery of isolated personnel in areas where conventional recovery capabilities do not exist, are not feasible, or are not acceptable. The training area is located within lands administered by the Coconino National Forest as shown in Figures 1 (Proposed military training area), 2 (Wildlife restrictive areas) and Figures 3A thru 3G (Travel lanes) and in accordance with Appendixes A (Angel Thunder 2015 – Coconino National Forest Stipulations) and B (2015 Visiting Flight Crew Aviation Briefing Packet). Military and volunteer participants will be transported via the use of helicopters, vehicles, or horseback. This authorization also includes the use of the Mormon Lake Helibase.

TERMS AND CONDITIONS

1. Use under this permit shall begin on 06/02/2015 and end on 06/13/2015. The permit shall not be extended.
2. The fee for this use is exempted.
3. The holder shall conduct the authorized activities according to the attached approved plans and specifications, Exhibit(s) Figures 1, 2 and 3A thru 3G and Appendixes A and B.
4. The holder shall not install any improvements not specifically identified and approved above.
5. No soil, trees, or other vegetation may be destroyed or removed from National Forest System lands without specific prior written permission from the authorized officer.
6. The holder shall comply with all Federal, State, county, and municipal laws, ordinances, and regulations which are applicable to the area or operations covered by this permit.
7. The holder shall maintain the improvements and premises to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer. The holder shall fully repair and bear the expense for all damage, other than ordinary wear and tear, to National Forest System lands, roads and trails caused by the holder's activities.
8. The holder has the responsibility of inspecting the use area and adjoining areas for dangerous trees, hanging limbs, and other evidence of hazardous conditions which would pose a risk of injury to individuals. After securing permission from the authorized officer, the holder shall remove such hazards.
9. The holder shall be liable for any damage suffered by the United States resulting from or related to use of this permit, including damages to National Forest resources and costs of fire suppression.

10. The holder shall hold harmless the United States from any liability from damage to life or property arising from the holder's occupancy or use of National Forest lands under this permit.
11. The holder agrees to permit the free and unrestricted access to and upon the premises at all times for all lawful and proper purposes not inconsistent with the intent of the permit or with the reasonable exercise and enjoyment by the holder of the privileges thereof.
12. This permit is subject to all valid existing rights and claims outstanding in third parties.
13. This permit may be revoked upon breach of any of the conditions herein or at the discretion of the authorized officer. Upon expiration or revocation of this permit, the holder shall immediately remove all improvements except those owned by the United States, and shall restore the site within five day(s), unless otherwise agreed upon in writing. If the holder fails to remove the improvements, they shall become the property of the United States, but that will not relieve the holder of liability for the cost of their removal and restoration of the site.
14. This permit is a license for the use of federally owned land. It does not grant any interest in real property. This permit is not transferable. The holder shall not enter into any agreements with third parties for occupancy of the authorized premises and improvements.
15. Appeal of any provisions of this permit or any requirements thereof shall be subject to the appeal regulations at 36 CFR 214 or revisions thereof.
16. This permit is accepted subject to the conditions set forth herein, condition(s) 1 thru 23 and Exhibit(s) Figures 1, 2 and 3A thru 3G and Appendixes A and B attached to and made a part of this permit.
17. The above clauses shall control if they conflict with additional clauses or provisions.
18. Cultural Resources Protection (D001RO). The holder, contractor, or lessee shall be responsible for the protection from damage of all identified cultural resources within the area which may be affected by their actions. In addition, the holder, contractor, or lessee shall be liable for all damage or injury to the identified cultural resources caused by their actions. The holder, contractor, or lessee shall immediately notify the agency Project Administrator if any damage occurs to any cultural resource and immediately halt work in the area in which damage has occurred until approval to proceed has been granted by the Project Administrator after consultation with the Forest Archeologist. All provisions of the Region 3 Cultural Resources Damage Assessment Handbook are incorporated by reference herein.
19. Native American Grave Protection and Repatriation Act (X003RO). Pursuant to the Native American Grave Protection and Repatriation Act (NAGPRA) 25 USC 3002(d); 43 CFR Part 10.4, if any human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during the course of ground disturbing activity, the holder will immediately cease activity in the area of the discovery and will make a reasonable effort to protect the remains and objects. The holder will provide immediate telephone notification of the discovery to the Forest Service, and will follow up with written confirmation to the authorized officer. The holder will not resume the activity that resulted in the discovery until the authorized officer gives written approval. Approval to resume the activity, if otherwise lawful, will be given thirty (30) days after certification by the authorized officer of the holder's written confirmation of the discovery, or at any time that a written binding agreement is executed between the Forest Service and the affiliated tribes adopting a recovery plan for the remains and objects.
20. Surveys, Land Corners (D4). The holder shall protect, in place, all public land survey monuments, private property corners, and Forest boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of the privileges permitted by this authorization, depending on the type of monument destroyed, the holder shall see that they are reestablished or referenced in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) the specifications of the county surveyor, or (3) the specifications of the Forest Service.

Further, the holder shall cause such official survey records as are affected to be amended as provided by law. Nothing in this clause shall relieve the holder's liability for the willful destruction or modification of any Government survey marker as provided at 18 U.S.C. 1858.

21. LOSS OF AUTHORIZED IMPROVEMENTS. If authorized temporary improvements in the permit area are destroyed or substantially damaged, the authorized officer shall conduct an analysis to determine whether the improvements can be safely occupied in the future and whether rebuilding should be allowed. If rebuilding is not allowed, the permit shall terminate.

22. HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION. The holder shall take all measures necessary to protect the environment, natural resources, and the health and safety of all persons affected by the use and occupancy authorized by this permit. The holder shall promptly abate as completely as possible and in compliance with all applicable laws and regulations any physical or mechanical procedure, activity, event, or condition existing or occurring before, during, or after the term of this permit, and arising out of or relating to any activity, event, or condition existing or occurring during the term of this permit, that causes or threatens to cause a hazard to workers' safety or to public health or safety or harm to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, their habitats, or any other natural resources). The holder shall prevent impacts to the environment and cultural resources by implementing actions identified in the operating plan to prevent establishment and spread of invasive species. The holder shall immediately notify the authorized officer of all serious accidents that occur in connection with such activities. The responsibility to protect the health and safety of all persons affected by the use and occupancy authorized by this permit is solely that of the holder. The Forest Service has no duty under the terms of this permit to inspect the permit area or operations and activities of the holder for hazardous conditions or compliance with health and safety standards.

23. LIABILITY FOR INJURY. As an agency of the United States, the holder is limited by federal law as to the assumption of liability for its acts or omissions. The holder agrees, within its legal limitations and limitations of appropriations, to be responsible for all damages arising from injury to persons or property associated with the use and occupancy authorized by this permit. The holder further agrees, to the extent legally permissible, to use its appropriations and resources as required to pay any claims and to repair damage to the federal lands covered by this permit. The Forest Service is exempt from any burdens, other than administrative costs, which may arise in connection with the use and occupancy authorized by this permit.

I have read and understand the terms and conditions and agree to abide by them.

HOLDER: UNITED STATES AIR FORCE

U. S. DEPARTMENT OF AGRICULTURE
Forest Service

By: _____
JAMES P. MEGER, Colonel, USAF
Commander 355th Fighter Wing
Address: 4575 S Phoenix St Bldg 4837
Davis- Monthan AFB, AZ 85707

By: _____

Name: Scott Russell

Title: Acting Forest Supervisor
(Authorized Officer)

Phone #: (520) 228-5157

Date: _____

Date: _____

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average one (1) hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

U.S. DEPARTMENT OF DEFENSE Military Training Area COC0541

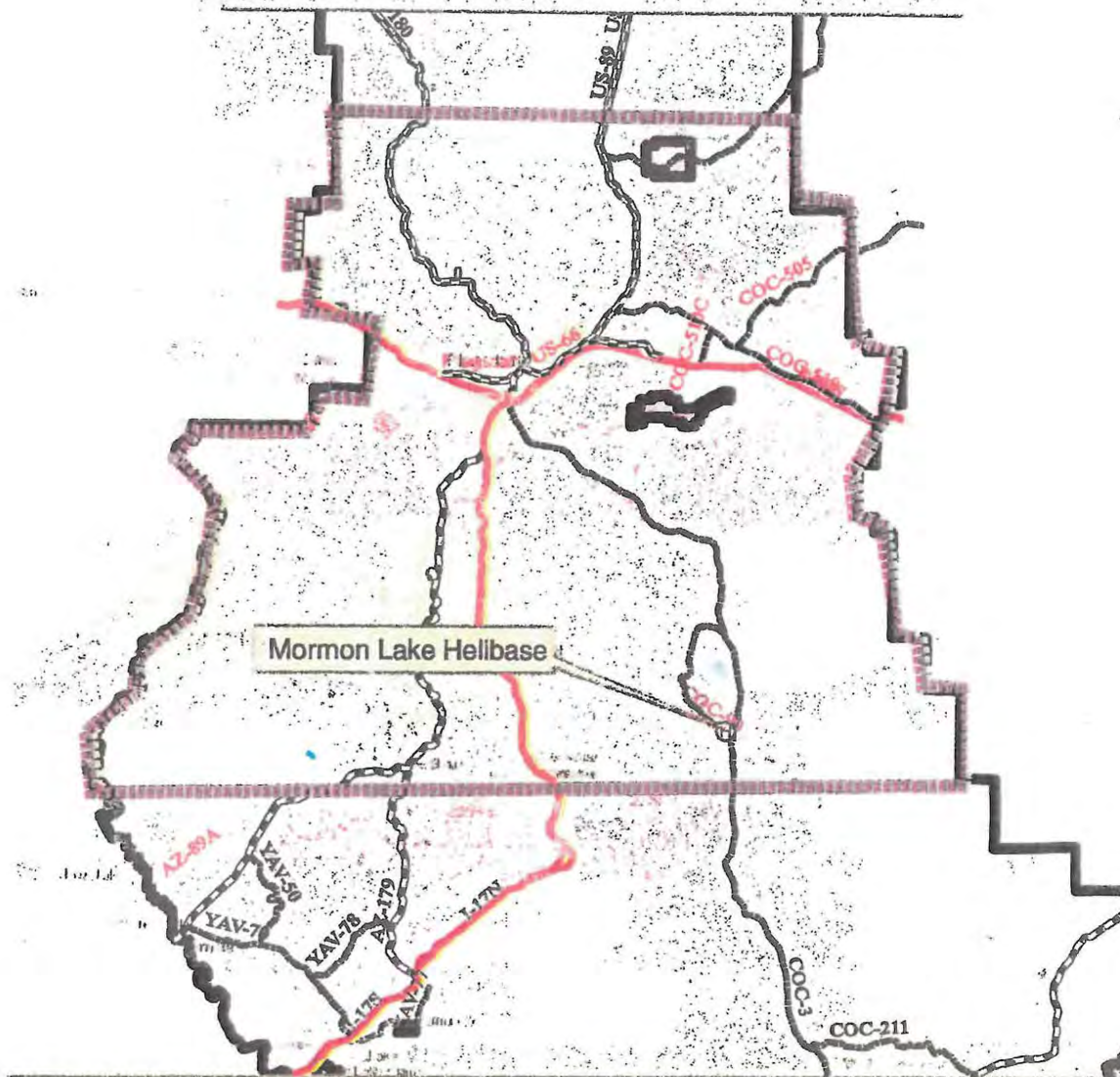


Figure 1

0 1.75 3.5 7 10.5 Miles

1:500,000

NAD83 UTM Zone 12N



Map prepared by SEM 4/23/2015

This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service. Geospatial information and GIS product accuracy may vary. This information was released on the indicated date. The Coconino National Forest reserves the right to correct, update, modify, or replace GIS products without notification.



U.S. DEPARTMENT OF DEFENSE
Military Training Area
COC0541

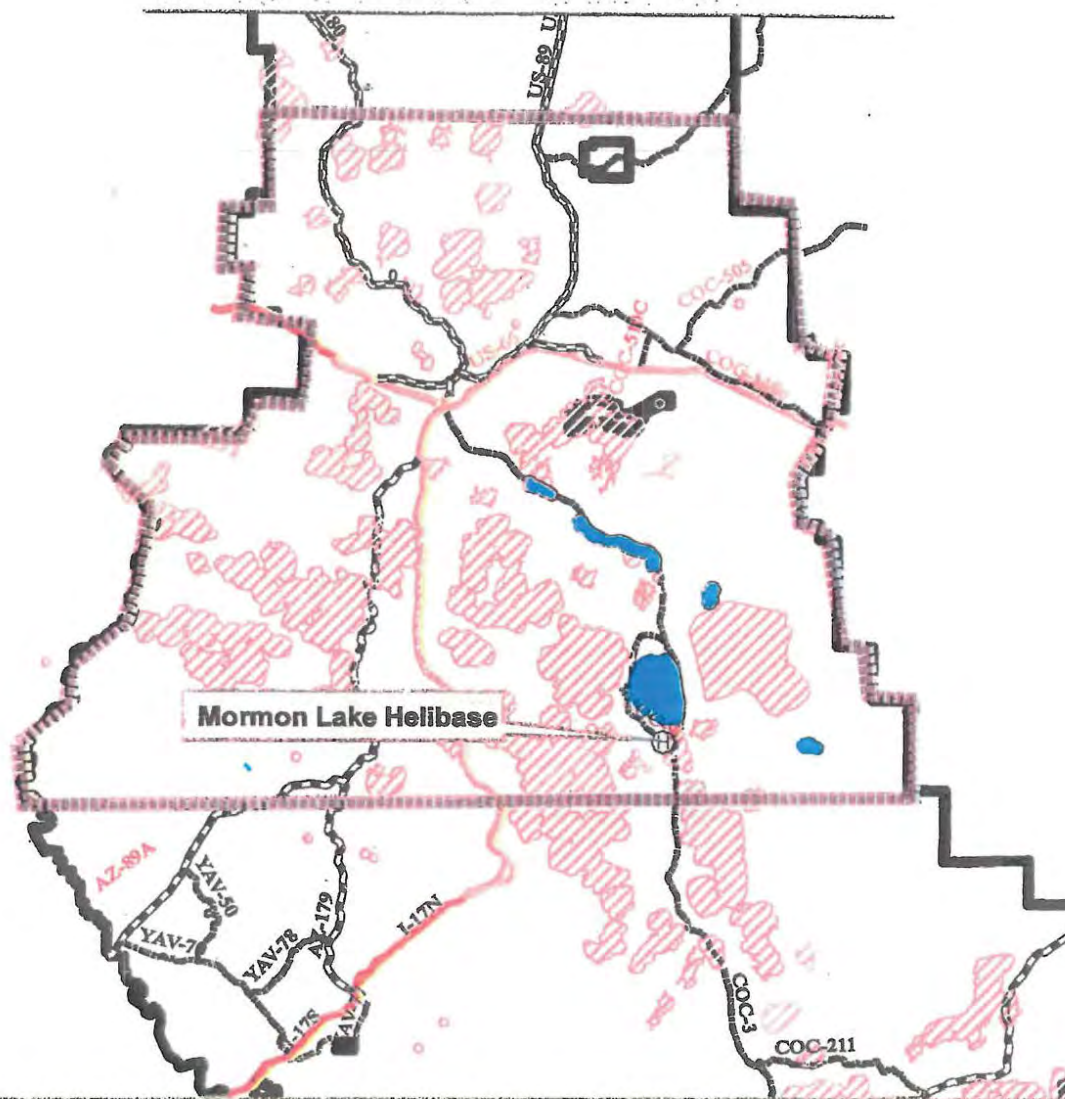


Figure 2

Map prepared by SEM 4/23/2015

0 1.75 3.5 7 10.5 Miles

1:500,000

NAD83 UTM Zone 12N



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FIGURE 3A

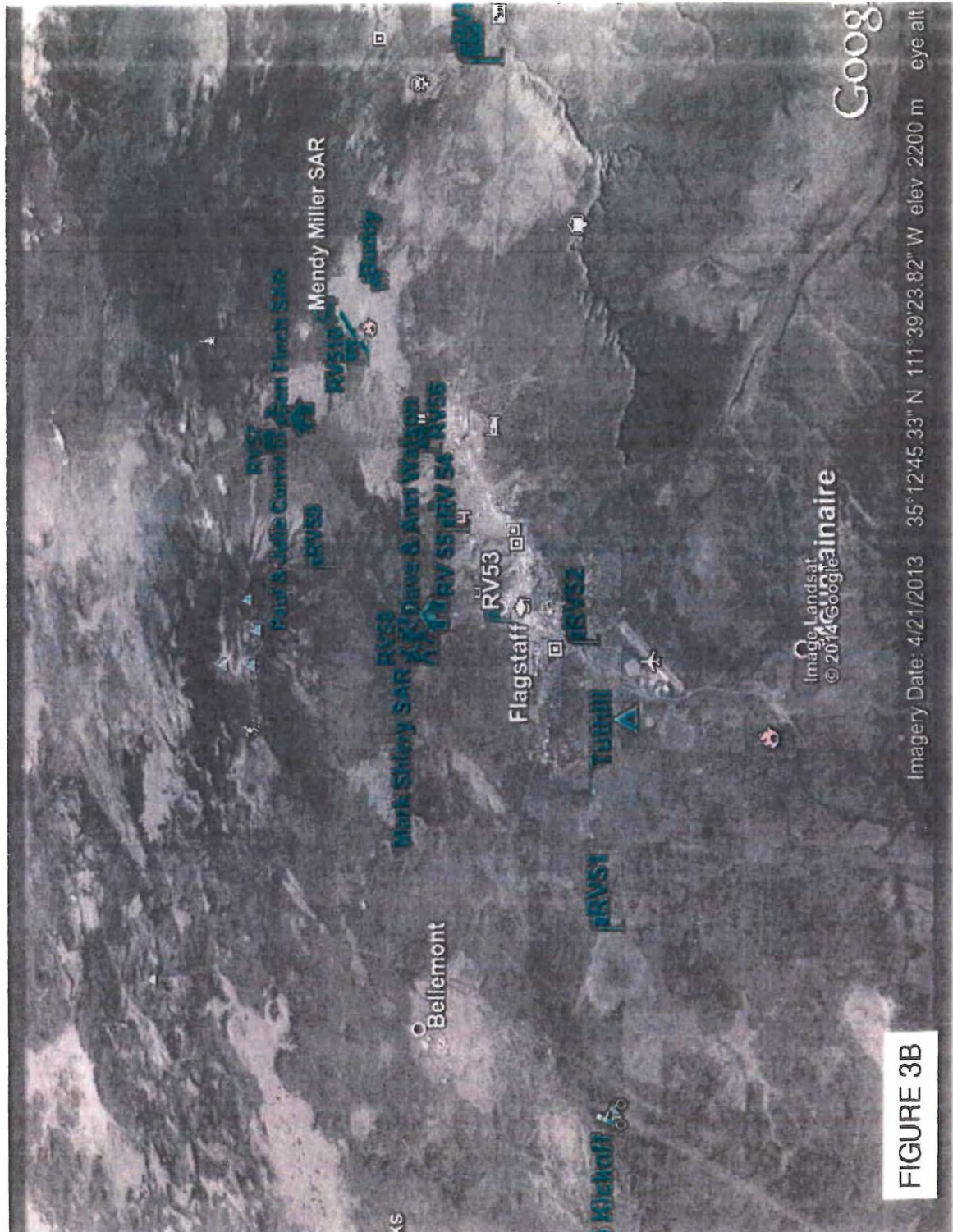


FIGURE 3B

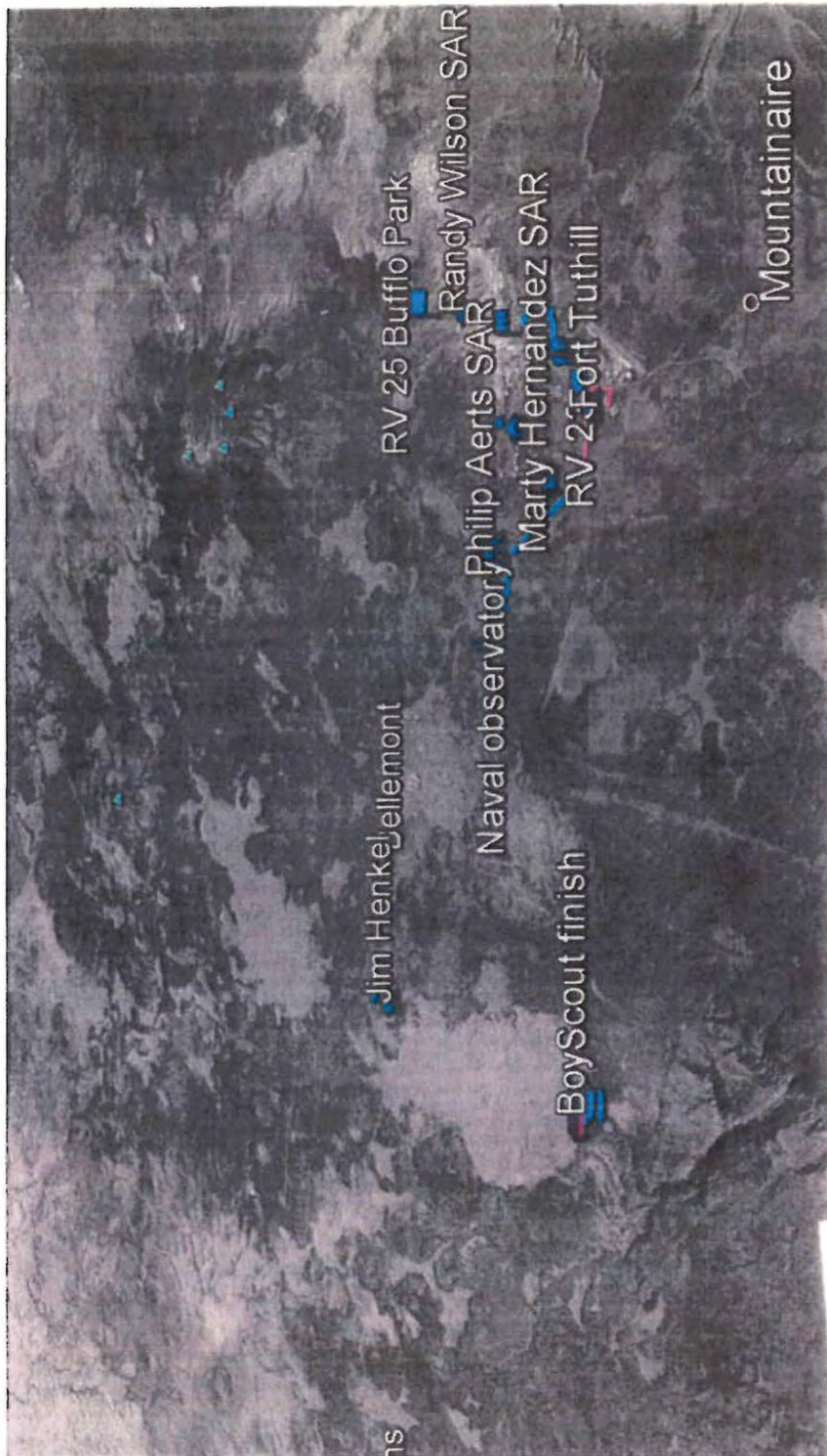


FIGURE 3C



FIGURE 3D



FIGURE 3E



FIGURE 3F

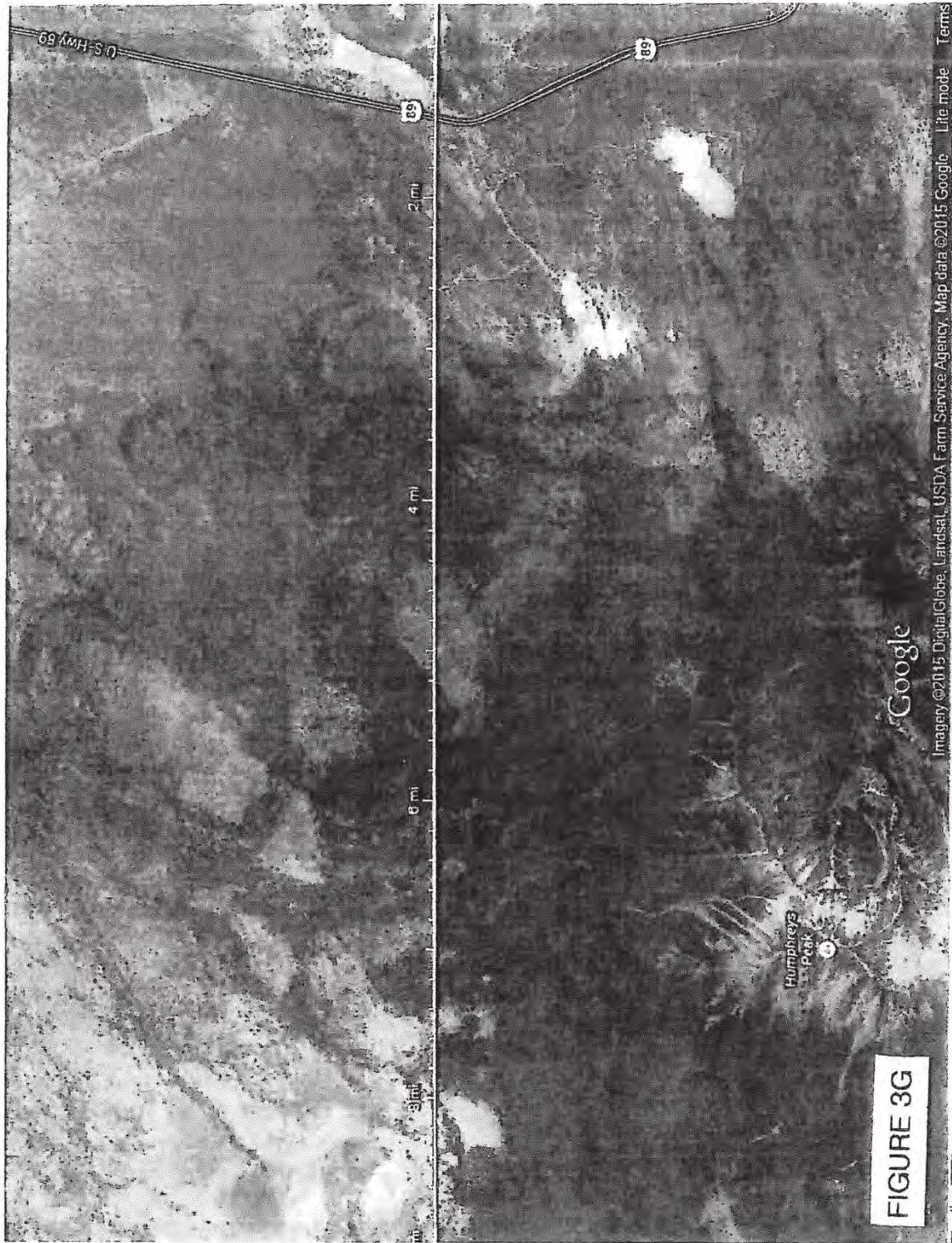


FIGURE 3G

APPENDIX A

ANGEL THUNDER 2015

COCONINO NATIONAL FOREST STIPULATIONS

- The Permit Holder or participants are not authorized to block vehicle or pedestrian traffic.
- The Permit Holder or participants must not interfere with Coconino National Forest's employees or the public's use of any areas within the permitted area.
- The Permit Holder or participants are not authorized to use warming and/or campfires at any time during the Angel Thunder activities on lands administered by the Coconino National Forest.
- The Permit Holder or participants are not authorized to use motor vehicles for cross county travels. Vehicle traffic is limited to the use of designated forest roads listed in the Coconino National Forest's 2015 Motor Vehicle Use Map (MVUM); all participants must have a copy of the MVUM map on hand during the Angel Thunder activities on lands administered by the Coconino National Forest.
- The use of horses by the Permit Holder or participants will abide with the following specifications:
 - The stock is required to be fed with certified weed free hay or pelletized cubes. Grazing is not authorized by this permit
 - Unless kept over-night in an established corral, all manure will be thoroughly scattered before departing the camp.
 - Trails or areas that are muddy will not be ridden on unless it can be done without damage.
 - Stock will not be allowed to damage trees in any way and will not be tied to them for extended periods (over one hour). When necessary to tie stock for longer periods, a temporary hitch line will be used. A temporary corral may be constructed if approved by a local Forest Officer.
- Wildlife Mitigation Measures in reference to Figure 2 map
 - Low level flights are restricted over the orange hatch areas.
 - Flights over open water are restricted to above 2000 feet.
- This military exercise is subject to the Coconino National Forest's area closures and flight restrictions that may occur due to wildfire.

APPENDIX B



Northern Arizona Zone

Coconino & Kaibab National Forest

Grand Canyon National Park

2015

Visiting Flight Crew

Aviation Briefing Packet

Any discrepancies, corrections or additions to this Aviation Briefing Packet contact:
Justin Jager- Interagency Aviation Officer (928) 266-5672

BRIEFING CHECKLIST

- ☐ Aviation Contacts: Dispatch office locations, phone numbers.
- ☐ Aviation Hazards & Special Considerations: Special use airspace; Grand Canyon SFAR, MTR's, MOA's, Airports, Flight Routes, Restricted Areas, known aerial hazards.
- ☐ Explain initial attack procedures and include regional requirement to monitor dip sites.
- ☐ Explain Zone aviation resource location and availability.
- ☐ Explain Forest and Park maps, layout of Districts, and other cooperating agencies.
- ☐ Frequencies; air-ground, IA victor, admin, fire, and repeaters. Give frequency lists and repeater map.
- ☐ Crash-Rescue plan; show pages that refer to local and Regional contact phone numbers, and hospitals to include latitude/longitudes. Point out other agency phone number pages.
- ☐ Any discrepancies, changes or additions to Briefing packet contact Interagency Aviation Officer
- ☐ Please return maps

RESOURCES RECEIVED

Air

- ☐ Northern Arizona Zone Briefing Packet
- ☐ Southwest Aviation Contacts and Commo Guide
- ☐ Repeater Location Map
- ☐ Forest and Park Radio Frequencies
- ☐ Local Contacts

Ground

- ☐ Kaibab N.F. Map
- ☐ Coconino N.F. Map
- ☐ 2015 Incident Organizer(s)
- ☐ Pocket Cards
- ☐ GRCA, KNF & COF Propaganda

AVIATION CONTACTS

INTERAGENCY AVIATION OFFICER

The Interagency Aviation Officer covering Coconino N.F., Kaibab N.F. and Grand Canyon N.P. is the primary contact for aviation related questions or concerns.

Interagency Aviation Officer: Justin Jager
Email: jjager@nps.gov
Cell: (928) 266-5672

WILLIAMS INTERAGENCY DISPATCH CENTER

Williams Interagency Dispatch Center provides dispatch services for the Kaibab N.F. and Grand Canyon N.P. All fire and project aircraft will be ordered through the Williams Dispatch Center. Dispatch is located at:

Kaibab National Forest Headquarters
800 South 6TH Street
Williams, AZ 86046
Phone number: (928) 635-2601

FLAGSTAFF INTERAGENCY DISPATCH CENTER

Flagstaff Interagency Dispatch Center provides dispatch services for the Coconino N.F. All fire and project aircraft on the Coconino will be ordered through Flagstaff Dispatch Center. Dispatch is located at:

Coconino National Forest Supervisor's Office
1824 S. Thompson St.
Flagstaff, AZ 86001
Phone number: (928) 527-3552

KAIBAB NATIONAL FOREST

Arthur Gonzales
Fire Staff Officer
aagonzales@fs.fed.us
Cell: (928) 606-2632

Holly Kleindienst
Deputy Fire Staff
Email: hkleindienst@fs.fed.us
Cell: (928) 853-6887

COCONINO NATIONAL FOREST

Don Mulse
Fire Staff Officer
Email: dmulse@fs.fed.us
Cell: (928) 606-5144

Duane Tewa
Deputy Fire Staff
Email: duanertewa@fs.fed.us
Cell: (505) 366-7677

LOCAL AIRCREWS

Kaibab Helitack

Helicopter Manager: Cole Orozco (928) 635-5659
Assistant Helicopter Manager: Mike Wallace (928) 699-5190

Grand Canyon Helitack

Helicopter Manager: Robert Dauphinais (928) 266-5633
Assistant Helicopter Manager: Matt Walls (928) 638-7822

Air Tactical Group Supervisor

Air Attack: Mike Vanderpass (208) 553-3577

AVIATION HAZARDS & SPECIAL CONSIDERATIONS

Refer to Aviation Hazard Maps for all information below.

If you encounter any new or unmarked aviation hazards notify the Interagency Aviation Officer as soon as possible.

AERIAL HAZARDS

Vertical obstructions are dispersed throughout Northern Arizona and surrounding lands. High level reconns will be used prior to any low level flights. Aerial hazards in Northern Arizona include but are not limited to:

- Microwave and radio towers
- High tension power lines
- Wind turbines
- Balloon Operations
- Lookout towers
- Condors
- Unmanned aerial systems
- High winds

Local airspace is host to recreational and commercial aviation including tour operators in the Grand Canyon and Sedona areas, as well as heavy General Aviation traffic in the summers near Grand Canyon, Sedona and Flagstaff.

SPECIAL USE AIRSPACE

The Grand Canyon National Park has Special Federal Aviation Regulations prohibiting flights in certain areas of the park. All pilots flying missions in these areas must have a current waiver on board and receive a briefing from the Interagency Aviation Officer or Grand Canyon Helibase prior to operating within the flight-free zones. The restricted airspace is identified and described on the Grand Canyon Sectional Aeronautical Chart.

MILITARY TRAINING ROUTES (MTR) & MILITARY OPERATING AREAS (MOA)

Camp Navajo, south of Bellemont, has a restricted area. The Northeastern corner of the Coconino N.F. is overlapped by the Sunny MOA. A portion of the Southeastern boundary of the Coconino N.F. is affected by the IR 112 MTR. In addition to established MTR's and MOA's Northern Arizona experiences a high number of transient military aircraft not on designated routes.

TRAUMA & BURN CENTERS

The nearest burn center is located in Phoenix at the Maricopa Medical Center. Transport of burn patients should be coordinated with either Williams or Flagstaff dispatch center. There are several air-ambulance services in Northern Arizona for transport of critical patients. Flagstaff has a level 1 trauma center with a heliport (N35 12' 30" x W111 38' 35"). This is an extremely busy heliport with a history of aviation accidents. All direct transports to Flagstaff trauma center will be coordinated with either Williams or Flagstaff Dispatch. Grand Canyon Helitack is a short-haul capable platform. Refer to the Aviation Incident/Accident Guide for Kaibab and Coconino N.F. for more information.

DENSITY ALTITUDE

During the summer months, "high and hot" conditions prevail throughout Northern Arizona. Terrain feature elevations as high as 12,632 feet exist in the area (Humphreys Peak). Prior to any aviation activity density altitude shall be a factor in the risk assessment.

RETARDANT USE NEAR WATERWAYS

Avoid aerial application of wildland fire chemicals within 300 feet of waterways. Complete and submit form NIFC 9210-18 the Interagency Aviation Officer, Justin Jager, to report any of the following events:

- Aerial application of retardant, foam or water enhancer (gel) in a waterway or within the 300-foot buffer area
- When a transportation accident results in a spill of a wildland fire chemical into a waterway or within the 300-foot buffer
- When ground resources apply a wildland fire chemical that enters or has potential to enter a waterway
- When applied on USFS administered lands in the habitats of the 45 Threatened & Endangered Species (TES) identified by the US Fish & Wildlife Service (USFWS) as being the most vulnerable to retardant, regardless of the 300' waterway buffer.

REGION 3 DIP SITE MONITORS

Since 1994, use of dip site monitors/observers is policy for Region 3. During helicopter bucket operations from any source (remote lake, pond, dirt tank, etc.), a monitor/observer will be in place at the dip site. This individual will be equipped, trained and capable of identifying and communicating concerns to helicopter pilots (i.e. fouled bucket lines), hell-base, Dispatch, etc. For further clarification contact the Interagency Aviation Officer.

TOPOGRAPHY

The topography of Northern Arizona varies significantly throughout the zone. Northern Arizona has several notable geographic features including the Grand Canyon, Red Rocks of Sedona and Humphreys Peak, the highest point in Arizona. Elevations in the zone vary from 3,000' in the lower deserts and bottom of the Grand Canyon to 12,633' at the top of Humphreys Peak. The area is dominated by volcanic mountains and major canyons. These topographic features can produce strong and erratic winds during the day as surrounding desert heat funnels up the major canyons and around high mountain features.

FUELS

Fuels in Northern Arizona vary as much as the topography. Fuels in the zone include pinon-juniper woodlands, ponderosa pine with oak and brush understories, mixed conifer, grasslands, sagebrush shrubland, spruce-fir, desert scrub, and various other desert and riparian communities. Pocket cards for the zone are updated annually and can be accessed at: <http://liam.nwcg.gov/liam-web/pocketcards/pocketcards.htm>. Please ensure that you have received an updated briefing on fuels conditions from district, forest or park personnel in addition to the pocket card. Fuels conditions across the zone can fluctuate greatly and change daily. Crews and vendors need to keep up with daily and seasonal fluctuation through daily forecasts and briefings.

AVIATION GROUND LOCATIONS

PITTMAN VALLEY HELI-BASE

Location: The Pittman Valley Helibase is located approximately eight miles east of Williams, Arizona at approximately 6925'. The lat/long coordinates of the base are: N 35°16.30 W 112°03.30. The base is approximately one road mile north of Exit 171 on Interstate 40. The main access road to the base (County/Forest Service Road 74) is paved. The physical address assigned to the helibase by Coconino County is 1782 Forest Service 74 road. Standard operating procedure is to contact Williams Dispatch for departure and upon arrival.

Aircraft Parking: There are two permanent designated helicopter-landing pads at Pittman Valley Helibase. Additional helicopter parking consists of three gravel pads just to the northwest of the concrete pads on the property. No night lighting is available at the pads.

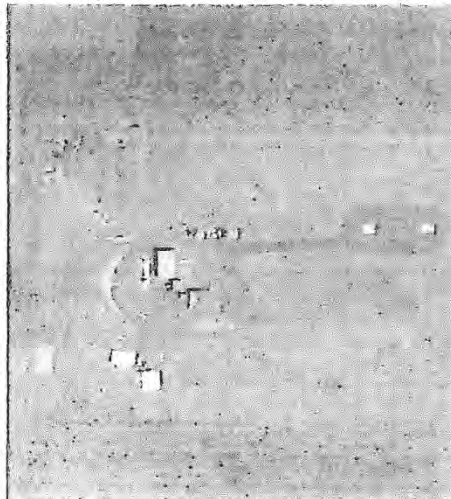
Fueling: No designated fueling pads exist on the helibase. Helicopters will be fueled on their designated pad. Closed circuit hot refueling is allowed if the helicopter, fuel truck, and vendors are approved for such operations. Hot refueling on the helibase will be the exception rather than the rule and will only be allowed when circumstances dictate a quick turnaround time and are requested by the agency. A spill kit is located on each fuel truck. Small spills will be handled by the helicopter vendor. In the event of a larger spill, the procedure will be to evacuate the area and call dispatch. Dispatch will notify the appropriate authorities and the Forest Hazardous Materials Coordinator.

Vehicle Parking: The helibase has designated parking areas for employee, visitor, helibase, and government vehicle parking. Only helitack support trucks and vendor vehicles will normally be allowed past the "helicopter operations area/authorized personnel only" signs along the access road.

Hazards: The Pittman Valley Helibase is located in an open flat meadow with no obstructions other than a 4' fence around the thirteen acres for the Pittman Valley Base Helibase. There is a power line to the south approximately 1/4 mile away, which runs east to west. The normal flight pattern when leaving the helibase is to the southwest. Departure or approach will not be over the power line directly to the south or southeast of the helibase. The normal and best approach and departure route is southwest on departure and from the north, northeast on approach. Prevailing wind is from the southwest. This landing area provides for safe helicopter operations, regardless of wind direction, because of the location and limited number of obstructions.

Contract: A Type III helicopter, Aerospatial A-Star 9-3, under a Regional Exclusive Use Contract is attached to the Kaibab module. The exclusive-use helicopter will be on contract 90 days, from May 1st thru July 29th.

Picture: Pittman
Valley Helibase



Contacts: Pitmann Valley Helibase: (928) 635-2487 Cell: (928) 699-6666
Kaibab Helitack Manager: Cole Orozco (928) 635-5659 Cell: (928) 699-5190
Kaibab Helitack Assistant Manager: Mike Wallace (928) 699-5190

GRAND CANYON SOUTHRIM HELIBASE

Location: Grand Canyon South Rim Helibase is located approximately six miles north of Grand Canyon Airport located in Tusayan, Arizona. The helibase is located approximately one more nautical mile north of the Class D airspace at a heading of 355 degrees. The South Rim Helibase is at an elevation of 6920 feet above MSL and a location of N36° 02.120 W112° 07.771 (WGS 84).

Aircraft Parking: There are currently four established concrete pads that are numbered and colored with a high-visibility yellow paint. The pads will accommodate all types of helicopters. There is additional landing area spread out on the 8 acres that can be used after coordination with the South Rim Helibase Manager.

Fueling: No designated fueling pads exist on the helibase. Helicopters will be fueled at their designated parking location. Closed circuit hot refueling is allowed if the helicopter, fuel truck, and vendors are approved for such operations. Hot refueling on the helibase will be the exception rather than the rule and will only be allowed when circumstances dictate a quick turn around and requested by the Government. Additional fuel is available at the Grand Canyon Airport.

Vehicle Parking: There are designated parking areas for employee, visitor, contractor, and government vehicle parking in the gravel parking outside the helibase fence. Only authorized personnel, helitack support trucks, and vendor vehicles will be in the helicopter operations area.

Hazards: The helibase is located within Special Flight Rules Area (SFRA) and a course through the IAT website (www.iat.gov) must be complete prior to arriving at the helibase. If the class and associated documentation are not complete prior to arrival, the pilot and crew will not be allowed into the SFAR and must land at Grand Canyon Airport. The helibase is also located adjacent to the tour routes and the area can be very busy dependent on the time of year. All transitioning traffic across the Grand Canyon should be aware of the tour corridors and the General Aviation (GA) traffic corridors. Refer to the Grand Canyon Nautical Chart for specifics.

Additionally, Grand Canyon South Rim Village is extremely close to the helibase and all flight operations need to avoid the village by entering and exiting the Grand Canyon at designated reporting locations. Due to the specific hazards and busy airspace, all crews and pilots shall receive a briefing at the South Rim Helibase by the Helibase Manager prior to becoming operational.

Contract: The Grand Canyon National Park contracts two Type III aircraft annually. The first, a MD 900, is on a 365 day contract is located at the South Rim Helibase daily. The other aircraft, an Aerospatial A-Star B3e, begins its contract May 1st and utilizes a 90 day contract ending in late July. It is often used as a second aircraft throughout the year when operations dictate.

Picture: South Rim Helibase



GRAND CANYON NORTH RIM HELISPOT

Unless specifically identified, the above information also applies to the North Rim Helibase.

Location: The North Rim Helispot is located at the top of Transept Canyon. It is also inside of the SFRA. The helispot is at an elevation of 8640 feet above MSL and a location of N36°12.80 W112°03.771 (WGS 84).

Aircraft Parking: The North Rim Helispot has two concrete pads that will support either two Type III helicopters or a combination of a Type III and a Type II helicopter. The helispot is too small to position two Type II helicopters at the same time.



Picture: North Rim Helispot

Contacts:

Grand Canyon South Rim Helibase: 928.638.7823/7936

Helicopter Program Manager: Robert Dauphinais, 928.638.7822/ 928.266.5633cell

MORMON LAKE HELIBASE

Location: Mormon Lake Helibase is located approximately 20 miles south of Flagstaff on Hwy 3 (Lake Mary Road). (N 34° 54 30 / W111° 26 17). Mormon Lake Helibase is a turn-key station and is not staffed unless needed.

Aircraft Parking: There is one concrete pad and an open meadow (CAUTION: a small power line runs through the meadow.)

Fueling: No designated fueling pads exist on the helibase. Helicopters will be fueled at their designated parking location. Closed circuit hot refueling is allowed if the helicopter, fuel truck, and vendors are approved for such operations. Hot refueling on the helibase will be the exception rather than the rule and will only be allowed when circumstances dictate a quick turn around and requested by the Government.

Vehicle Parking: There is designated parking areas crews and vendors. Only authorized personnel, helitack support trucks and vendor vehicles will be in the helicopter operations area.

Hazards: A power line runs through the meadow in front of the station. Perform a high level recon prior to landing.

FLAGSTAFF (PULLIAM) AIRPORT

FAA Identifier: FLG
Location: 4 miles S of Flagstaff, AZ
Elevation: 7014 ft
Airport Services: 100LL JET-A, Fuel Self Service 24hrs, parking and hangars
FBO: Wiseman Aviation (928) 779-9585

SEDONA AIRPORT

FAA Identifier: SEZ
Location: 2 miles SW of Sedona, AZ
Elevation: 4,830 ft
Airport Services: 100LL JET-A, tie-downs
FBO: Red Rock Aviation (928) 282-1046

WILLIAMS AIRPORT (CLARK MEMORIAL FIELD)

FAA Identifier: CMR
Location: 3 Miles N of Williams, AZ
Elevation: 6,691 ft
Airport Services: 100LL, Fuel Self Service 24hrs
FBO: City Of Williams (928) 635-1280

GRAND CANYON NATIONAL PARK AIRPORT

FAA Identifier: GCN
Location: 6 miles S of Grand Canyon, AZ
Elevation: 6,600 ft
Airport Services: 100LL, Fuel Self Service 24hrs
FBO: Grand Canyon Airlines (928) 638-7117

KANAB AIRPORT

FAA Identifier: KNB
Location: 2 miles S of KANAB, UT
Elevation: 4,868 ft
Airport Services: 100LL JET-A
FBO: Kanab Airport (435) 644-2299

PAGE AIRPORT

FAA Identifier: PGA
Location: 1 mile E of PAGE, AZ
Elevation: 4,316 ft
Airport Services: 100LL JET-A
FBO: Classic Aviation (928) 771-5945

MAP WEBSITES & QR CODES

Coconino & Kaibab N.F. Aviation Hazards

http://www.nps.gov/grca/learn/management/upload/kaibab_coconino_aviation_hazards.pdf



Kaibab N.F. and Grand Canyon N.P. Aviation Hazards

http://www.nps.gov/grca/learn/management/upload/grca_kaibab_aviation_hazards.pdf



Colorado River Dip Spots

http://www.nps.gov/grca/learn/management/upload/co_river_helicopter_dip_zones_usfws.pdf



MAP HTTP & QR CODES

Grand Canyon N.P. South Rim Road Map

http://www.nps.gov/grca/learn/management/upload/south_rim_road_map.pdf



Grand Canyon N.P. North Rim Road Map

http://www.nps.gov/grca/learn/management/upload/north_rim_road_map.pdf



Closest Regional Tanker Bases

http://www.nps.gov/grca/learn/management/upload/grca_regional_tanker_bases_map.pdf



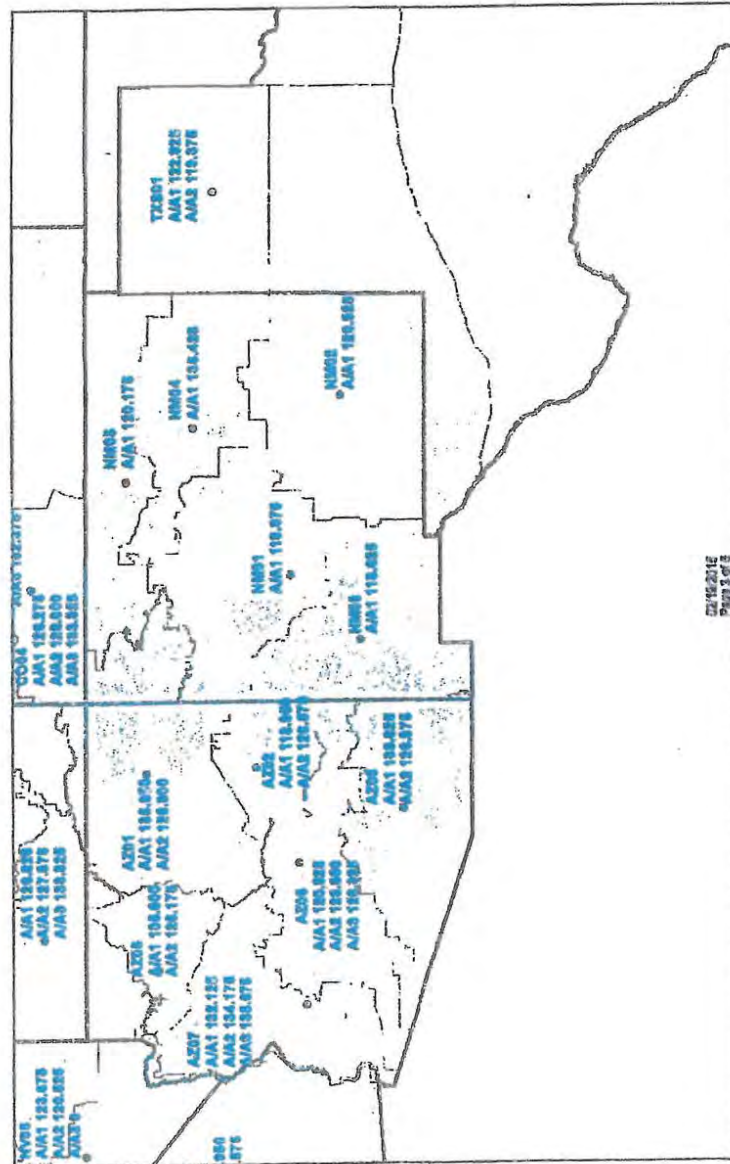
SWCC



The information on this map are classified but Section 1 and are not releasable under the Freedom of Information Act

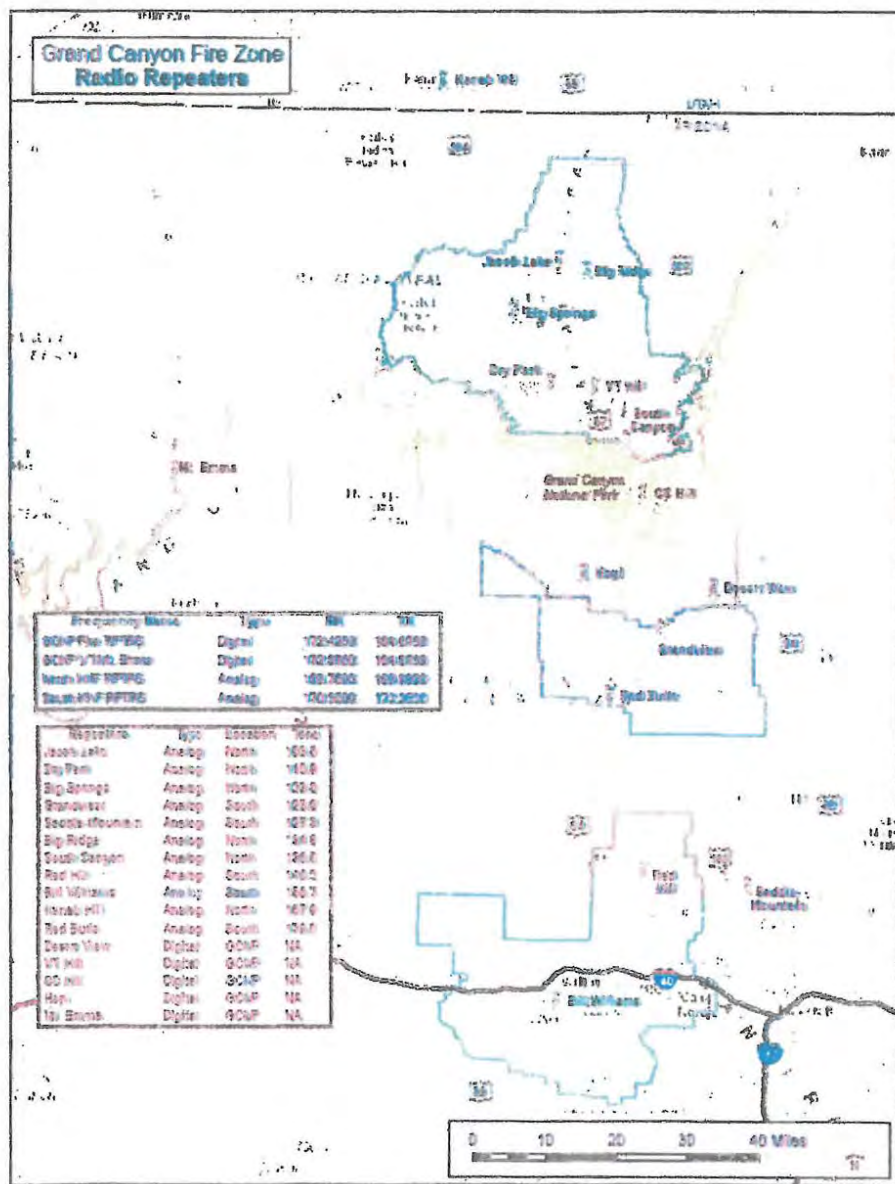
The following are the names of the persons who have been appointed to the various committees of the Board of Directors of the American Society of International Law.

National Emergency Incident Communications Division

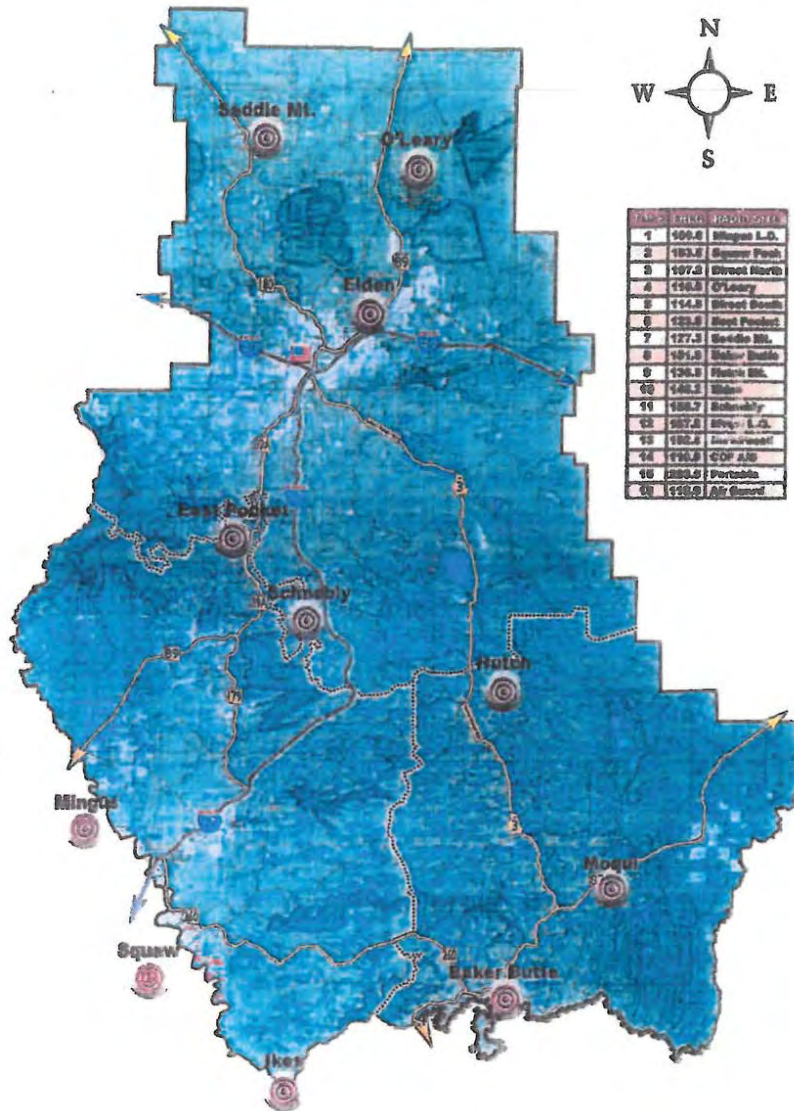


02/12/2015
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Revision 4.0

KAIBAB & GRAND CANYON REPEATER MAP



Coconino National Forest Repeater Locations



KAIBAB & GRAND CANYON COMMUNICATION PLAN

KAIBAB NF COMMUNICATIONS PLAN		1. District/Zone South Kaibab (Group 1)	2. Date Prepared 01/07/2015	3. Operational Period 2015 Season	
4. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 SKNF SIM	South Kaibab Simplex	170.5500 RX/TX (Narrow)	Forest Net Line of Sight	<u>South Kaibab Tones:</u> 1. 103.5 Simplex 2. 136.5 South Canyon 3. 146.2 Red Hill 4. 156.7 Bill Wms. 6. 179.9 Red Butte 8. 123.0 Grandview
	2 SKNF RPT	South Kaibab Repeat	170.5500 RX 172.2500 TX (Narrow)	Forest Net Repeater	
	3 COF NZ RPT	North Coconino Repeater	171.4250 RX 164.0750 TX (Narrow)	Forest North Zone Repeater	
	4 COF SZ RPT	South Coconino Repeat	172.3000RX 1164.8750 TX (Narrow)	Forest South Zone Repeater	<u>NZ Coconino NF Tones:</u> 2. 136.5 Hutch Mt 3. 146.2 Mt. Elden 4. 156.7 Schnebly Hill 7. 127.3 Saddle Mt. 8. 123.0 East Pocket 9. 110.9 O'Leary L.O 13. 203.5 Portable
	5 PNF SIM	Prescott NF Fire Simplex	172.2250 RX/TX (Narrow)	Prescott NF Line of Sight	
	6 PNF RPT	Prescott NF Fire Repeat	172.225 RX 168.675 TX (Narrow)	Prescott NF Repeater	
	7 GCP SIM	Grand Canyon NP Simplex (Digital)	172.4250 RX/TX (Narrow)	Grand Canyon Fire Net Line of Sight	<u>SZ Coconino NF Tones:</u> 1. 103.5 Squaw PK 2. 136.5 Hutch Mt. 4. 156.7 Schnebly Hill 5. 167.9 Moqui LO 8. 123.0 East Pocket 10. 100. Mingsus Mt. 11. 131.8 Baker Butte 12. 192.8 Ike/Fossil Creek 13. 203.5 Portable
	8 GCP RPT	Grand Canyon NP Repeat (Digital)	172.4250 RX 164.6750 TX (Narrow)	Grand Canyon Fire Repeater	
	9 GCZ A/G	GCZ Air-to-Ground	171.4750 RX/TX (Narrow)	GCZ Assigned Air Operations	
	10 FLZ A/G	FLZ Air-to-Ground	171.5750 RX/TX (Narrow)	FLZ Assigned Air Operations	
	11 NIIMS	NIIMS	154.280 RX/TX (Wide)	Interagency Communications	
	12 TAC 1	TAC 1	167.5500 RX/TX (Narrow)	Alternate Tactical	<u>Prescott NF Tone:</u> 9. 110.9 Mingsus Mt.
	13 TAC 2	TAC 2	168.6750 RX/TX (Narrow)	Primary Forest Tactical	
	14 TAC 3	TAC 3	168.7750 RX/TX (Narrow)	Alternate Tactical	
	15 TRAVEL	Travel Simplex	168.3500 RX/TX (Narrow)	Travel Communications	
	16 AIR GUARD	Air Guard (see Remarks)	168.6250 RX/TX (Narrow)	Air Operations Initial Contact or Emergency Traffic	<u>Air Guard</u> **In order to transmit properly on Air Guard, press "0" prior to transmitting.

Air Guard
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properly on Air Guard,
press "0" prior to
transmitting.

KALBAB NF COMMUNICATIONS PLAN		1. District/Zone North Kalbab (Group 2)	2. Date Prepared 01/07/2015	3. Operational Period 2015 Season	
4. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 NKNF SIM	North Zone Simplex	168.7500 RX/TX (Narrow)	Forest Net Line of Sight	<u>NKRD Tones:</u> 1. 103.5 Jacob Lake 2. 110.9 Dry Park 3. 123.0 Big Springs 4. 131.8 Big Ridge 5. 136.5 South Canyon 6. 167.9 Kanab Hill <u>AZ Strip BLM Tones:</u> 2. 110.9 Big Mt. 3. 123.0 Hudson 4. 131.8 Black Rock 5. 136.5 Scrub 6. 167.9 Mt. Logan 7. 167.9 Big Ridge 8. 156.7 Moccasin <u>Dbble NF Tones:</u> 1. 103.5 Blowhard 2. 110.9 Big Mt. 3. 123.0 Wilson Peak 4. 131.8 Mt. Dutton 5. 136.5 Barney Top 6. 167.9 Rudd's Roost 8. 156.7 Toquerville Hill 9. 100.0 Utah Hill
	2 NKNF RPT	North Zone Repeat	168.7500 RX 169.9000 TX (Narrow)	Forest Net Repeater	
	3 TAC 2	TAC 2	168.6750 RX/TX (Narrow)	Primary Forest Tactical	
	4 GCZ A/G	Air-to-Ground	171.4750 RX/TX (Narrow)	GCZ Assigned Air Operations	
	5 SEC A/G	Secondary Air/ Ground	167.9875 RX/TX (Narrow)	GCZ Assigned Sec: A/G	
	6 STRIP RPT	AZ Strip Repeat	173.8250 RX 166.3375 TX (Narrow)	AZ Strip BLM Repeater	
	7 GCP SIM	Grand Canyon NP Simplex (Digital)	172.4250 RX/TX (Narrow)	Grand Canyon Fire Net Line of Sight	
	8 GCP RPT	Grand Canyon NP Repeat (Digital)	172.4250 RX 164.6750 TX (Narrow)	Grand Canyon Fire Repeater	
	9 DIXIE SIM	Dbble NF Simplex	171.5500 RX/TX (Narrow)	Dbble NF Line of Sight	
	10 DIXIE RPT	Dbble NF Repeat	171.5500 RX 172.3500 TX (Narrow)	Dbble NF Repeater	
	11 BLM KNB	Kanab BLM Repeat	170.3625 RX 165.4500 TX (Narrow)	Kanab BLM Repeater	
	12 NIIMS	NIIMS	154.280 RX/TX (Wide)	Interagency Communications	
	13 TAC 1	TAC 1	167.5500RX/TX (Narrow)	Alternate Tactical	
	14 TAC 3	TAC 3	168.7750 RX/TX (Narrow)	Alternate Tactical	
	15 DECK	GCP Helitack	163.1000 RX/TX (Narrow)	Helitack Deck	
	16 ZION SIM	Zion NP Simplex	166.3250 RX/TX (Narrow)	Zion NP Line of Sight	

KAIBAB NF COMMUNICATIONS PLAN		1. District/Zone Grand Canyon NP Fire (Group 3)	2. Date Prepared 01/07/2015	3. Operational Period 2015 Season	
4. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 GCP SIM	Grand Canyon NP Fire Simplex (Digital)	172.4250 RX/TX (Narrow)	Grand Canyon NP Fire Line of Sight	North Zone Tones: 1. 103.5 Simplex/Jacob Lake 2. 136.5 South Canyon 5. 167.9 Kanab Hill 8. 123.0 Big Springs 9. 110.9 Dry Park 10. 131.8 Big Ridge South Zone Tones: 1. 103.5 Simplex 2. 136.5 South Canyon 3. 146.2 Saddle Mt. 4. 156.7 Bill Wms. 6. 179.9 Red Butte 8. 123.0 Grandview Air Guard **In order to transmit properly on Air Guard, press "0" prior to transmitting.
	2 GCP RPT	Grand Canyon NP Fire Repeat (Digital)	172.4250 RX 164.6750 TX (Narrow)	Grand Canyon NP Fire Repeater	
	3 GCP VT	Grand Canyon NP Fire Repeat (Digital)	172.6750 RX 164.6750 TX (Narrow)	Grand Canyon NP Fire Repeater	
	4 GCP EMMA	Grand Canyon NP Fire Repeat (Digital)	172.6750 RX 164.6750 TX (Narrow)	Grand Canyon NP Fire Repeater	
	5 NKNF RPT	North Zone Repeat	168.750 RX 169.900 TX (Narrow)	NZ Forest Net Repeater	
	6 SKNF RPT	South Zone Repeat	170.5500 RX 172.2500 TX (Narrow)	SZ Forest Net Repeater	
	7 TAC 1	TAC 1	167.5500 RX/TX (Narrow)	Alternate Tactical	
	8 TAC 2	TAC 2	168.6750 RX/TX (Narrow)	Primary Forest Tactical	
	9 TAC 3	TAC 3	168.7750 RX/TX (Narrow)	Alternate Tactical	
	10 NIIMS	Mutual Aid	154.280 RX/TX (Wide)	Interagency Communications	
	11 ADM RPT	Grand Canyon NP General Operations (Digital)	169.6500 RX 163.5750 TX (Narrow)	Non- Emergency Operations	
	12 MED RPT	Grand Canyon NP Medical Operations (Digital)	171.7750 RX 163.0250 TX (Narrow)	Grand Canyon NP Medical Operations	
	13 GCP TACR	Grand Canyon NP Tactical Repeat (Digital)	169.7750 RX 164.1625 TX (Narrow)	Grand Canyon NP Tactical	
	14 AIR GRD	Air Guard (see Remarks **)	168.6250 RX/TX (Narrow)	Air Operations Initial Contact or Emergency Traffic	
	15 DECK	GCP Helitack	163.1000 RX/TX (Narrow)	Helitack Deck	
	16 GCZ A/G	GCZ Air-to-Ground	171.4750 RX/TX (Narrow)	GCZ Assigned Air Operations	

KAIBAB NF COMMUNICATIONS PLAN		1. District/Zone PFAC (Group 4)	2. Date Prepared 01/07/2015	3. Operational Period 2015 Season	
4. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 FIRE NET 1	Coconino NF Command Simplex	171.5500 RX/TX (Narrow)	Forest Net Line of Sight	<u>Tones:</u> 7. 131.8 8. 173.8 9. 156.7 12. 123.0 14. 156.7 16. 110.9 **In order to transmit properly with these tones on the associated frequency, press "0" prior to transmitting.
	2 FIRE NET 2	Coconino NF Admin Simplex	172.3000 RX/TX (Narrow)	Forest Net Line of Sight	
	3 FS TAC 1	TAC 1	167.5500RX/TX (Narrow)	Alternate Forest Tactical	
	4 FS TAC 2	TAC 2	168.6750RX/TX (Narrow)	Alternate Forest Tactical	
	5 FS TAC 3	TAC 3	168.7750 RX/TX (Narrow)	Primary Forest Tactical	
	6 BLANK	N/A	RX/TX (Narrow)	Unassigned	
	7 AZ TAC 1	TAC 1	159.3300 RX/TX **	State Tactical	
	8 AZ TAC 2	TAC 2	159.2400 RX/TX **	State Tactical	
	9 VTAC 2	State Mutual Aid	154.4525 RX/TX ** (Narrow)	State Mutual Aid	
	10 MUT AID	NIIMS	154.280 RX/TX	Mutual Aid	
	11 FS A/G	Air/Ground	171.5750 RX/TX (Narrow)	FLZ Assigned Air Operations	
	12 AZ A/G	Air/Ground	159.4500 RX/TX **	AZ State Assigned Air Operations	
	13 SKNF SIM	South Kaibab Simplex	170.5500 RX/TX (Narrow)	Forest Net Line of Sight	
	14 SKNF RPT	South Kaibab Repeat	170.5500 RX ** 172.2500 TX ** (Narrow)	Forest Net Repeater	
	15 NIIMS	NIIMS	154.280 RX/TX	Interagency Communications	
	16 GUARD	Air Guard (see Remarks)	168.6250 RX/TX ** (Narrow)	Air Operations Initial Contact or Emergency Traffic	
KAIBAB NF COMMUNICATIONS PLAN		5. District/Zone GCP Mutual Aid (Group 5)	6. Date Prepared 01/07/2015	7. Operational Period 2015 Season	

8. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 CCSO SIM	Coconino County Sheriff Dispatch Simplex	155.490 RX/TX (Wide)	Sheriff Net Line of Sight	<u>CCSO Tones:</u> 2. 162.2 Hopi Point 3. 186.2 Jacob Lake <u>AZ State Tones:</u> 5. 156.7 6. 131.8 7. 123.0 8. 167.9 9. 156.7 10. 156.7 11. 156.7 12. 156.7 13. 156.7 14. 162.2
	2 CCSO HOPI	Coconino County Sheriff Dispatch Repeat	155.490 RX 159.210 TX (Wide)	Sheriff Net Hopi Repeater	
	3 CCSO JL	Coconino County Sheriff Dispatch Repeat	155.490 RX 159.210 TX (Wide)	Sheriff Net Jacob Lake Repeater	
	4 CCSO OPS	Coconino County Sheriff Tactical	155.370 RX/TX (Wide)	Sheriff Tactical Line of Sight	
	5 AIRS SIM	AZ State Mutual Aid Command Simplex	155.475 RX/TX (Wide)	AZ State Line of Sight	
	6 AIRS 2	AZ State Mutual Aid Command Repeat	155.475 RX 155.190 TX (Wide)	Coconino County	
	7 AIRS 4	AZ State Mutual Aid Command Repeat	155.475 RX 155.190 TX (Wide)	Mohave, Navajo, & Apache Counties	
	8 AIRS 5	AZ State Mutual Aid Command Repeat	155.475 RX 155.190 TX (Wide)	Yavapai County	
	9 AIRS AZ	AZ State Mutual Aid Command Repeat	155.475 RX 155.190 TX (Wide)	Areas Near County Boundaries	
	10 VCALL	AZ State Tactical	155.7525 RX/TX (Narrow)	Statewide	
	11 VTAC 3	AZ State Tactical	158.7375 RX/TX (Narrow)	Coconino County	
	12 VTAC 2	AZ State Tactical	154.4525 RX/TX (Narrow)	Mohave County	
	13 VTAC 4	AZ State Tactical	159.4725 RX/TX (Narrow)	Apache, Navajo, & Yavapai Counties	
	14 AIDC WMS	AZ Dispatch Center Repeat	151.400RX 159.405TX (Narrow)	AZ Dispatch Center Repeater	
	15 TUS FD	Tusayan Fire Department Simplex	154.010RX/TX (Wide)	Tusayan FD Line of Sight	
	16 NIIMS	NIIMS	154.280 RX/TX (Wide)	Interagency Communications	
KAIBAB NF COMMUNICATIONS PLAN		9. District/Zone GCP 5R EVAC (Group 6)	10. Date Prepared 01/07/2015	11. Operational Period 2015 Season	

12. Basic Radio Channel Utilization					
Radio Type	Radio Display (Alpha Numeric)	Function	Frequency	Assignment	Remarks
Bendix/King Mobiles & Portables	1 FIRE SIM	Grand Canyon NP Fire Simplex (Digital)	172.4250 RX/TX (Narrow)	Grand Canyon NP Fire Line of Sight	<u>AZ State Tones:</u> 3. 156.7 4. 131.8 5. 156.7
	2 FIRE RPT	Grand Canyon NP Fire Repeat (Digital)	172.4250 RX 164.6750 TX (Narrow)	Grand Canyon NP Fire Repeater	
	3 AIRS SIM	AZ State Mutual Aid Command Simplex	155.475 RX/TX (Wide)	AZ State Line of Sight	<u>Kalbab NF Tones:</u>
	4 AIRS 2	AZ State Mutual Aid Command Repeat	155.475 RX 155.190 TX (Wide)	Coconino County	
	5 VTAC 3	AZ State Tactical	158.7375 RX/TX (Narrow)	Coconino County	6. 123.0 7. 179.9
	6 SKNF GV	South Kalbab Repeat	170.5500 RX 172.2500 TX (Narrow)	Forest Net Repeater	<u>Xanterra Tone:</u> 11. 123.0
	7 SKNF RB	South Kalbab Repeat	170.5500 RX 172.2500 TX (Narrow)	Forest Net Repeater	
	8 TAC 1	TAC 1	167.5500RX/TX (Narrow)	NIFC Tactical	
	9 TAC 2	TAC 2	168.6750 RX/TX (Narrow)	NIFC Tactical	
	10 TAC 3	TAC 3	168.7750 RX/TX (Narrow)	NIFC Tactical	
	11 XAN RPT	Xanterra Operations	153.890 RX 154.445 TX (Wide)	Xanterra Operations	
	12 GCP TACR	Grand Canyon NP Tactical Repeat (Digital)	169.7750 RX 164.1625 TX (Narrow)	Grand Canyon NP Tactical	
	13 MED RPT	Grand Canyon NP Medical Operations (Digital)	171.7750 RX 163.0250 TX (Narrow)	Grand Canyon NP Medical Operations	
	14 NIIMS	NIIMS	154.280 RX/TX (Wide)	Interagency Communications	
	15 DECK	GCP Helitack	163.1000 RX/TX (Narrow)	Helitack Deck	
	16 GCZ A/G	Air-to-Ground	171.4750 RX/TX (Narrow)	GCZ Assigned Air Operations	

COCONINO N.F. COMMUNICATIONS PLAN

CHANNEL	RX FREQ	TX FREQ	REPEATER TX TONE	TYPE OF USE
1	171.425	171.425	100.0	NORTH DIRECT
2	172.300	172.300	103.5	SOUTH DIRECT
3	171.425	164.075	107.2	NORTH REPEAT
4	172.300	164.875	110.9	SOUTH REPEAT
5	170.550	172.250	114.8	KAIBAB FIRE
6	172.225	168.675	123.0	PRESCOTT FIRE
7	164.825	164.125	127.3	TONTO FIRE
8	166.950	166.350	131.8	FLAG NPS
9	164.200	None	136.5	WX
10	167.550	167.550	146.2	TAC 1
11	168.675	168.675	156.7	TAC 2
12	168.775	168.775	167.9	TAC 3
13	154.280	154.280	192.8	MUTUAL AID
14	171.575	171.575	110.9	COF A/G
15	168.350	168.350	203.5	TRAVEL
16	168.625	168.625	110.9	AIR GAURD

*****The above group is Tone Selectable**

TONES

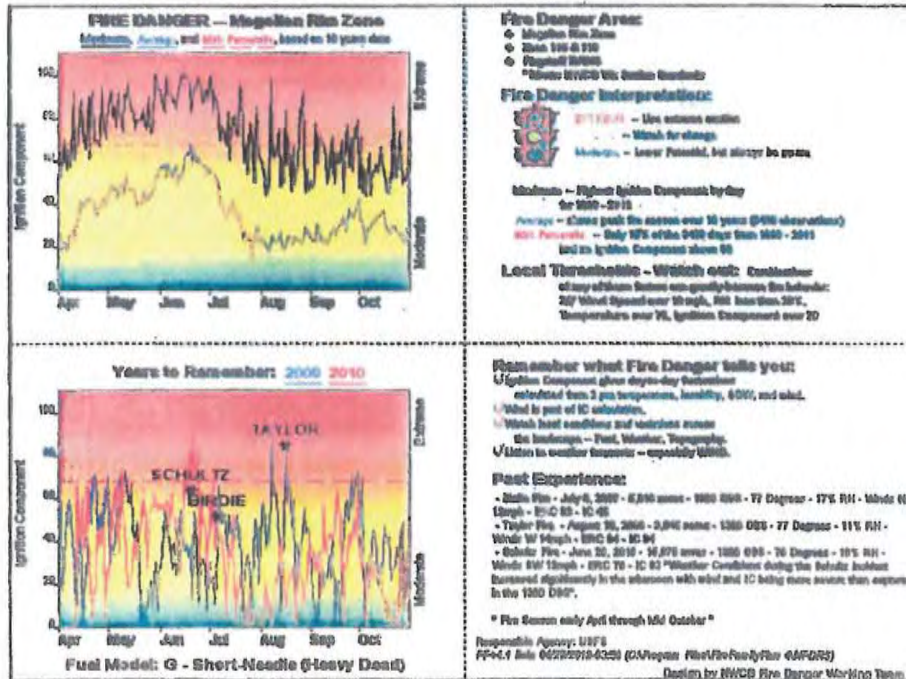
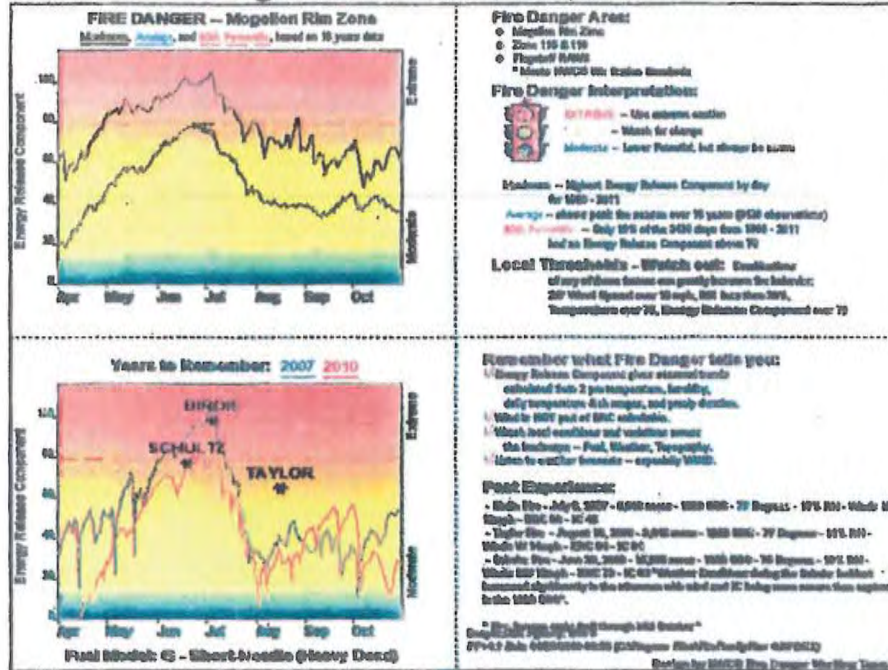
STONE	FREQUENCY	MOUNTAIN TOP	CHANNEL
1	100.0	Mingus	South
2	103.5	Squaw Peak	South
3	107.2	North Direct	North
4	110.9	O'Leary	North
5	114.8	South Direct	South
6	123.0	East Pocket	North and South
7	127.3	Saddle Mtn	North
8	131.8	Baker Butte	South
9	136.5	Hutch Mtn	North and South
10	146.2	Elden	North
11	156.7	Schnebly	North and South
12	167.9	Moqui L.O.	South
13	192.8	Fossil	South
14	110.9	COF A/G	
15	203.5	Portable	
16	110.9	Air Guard	

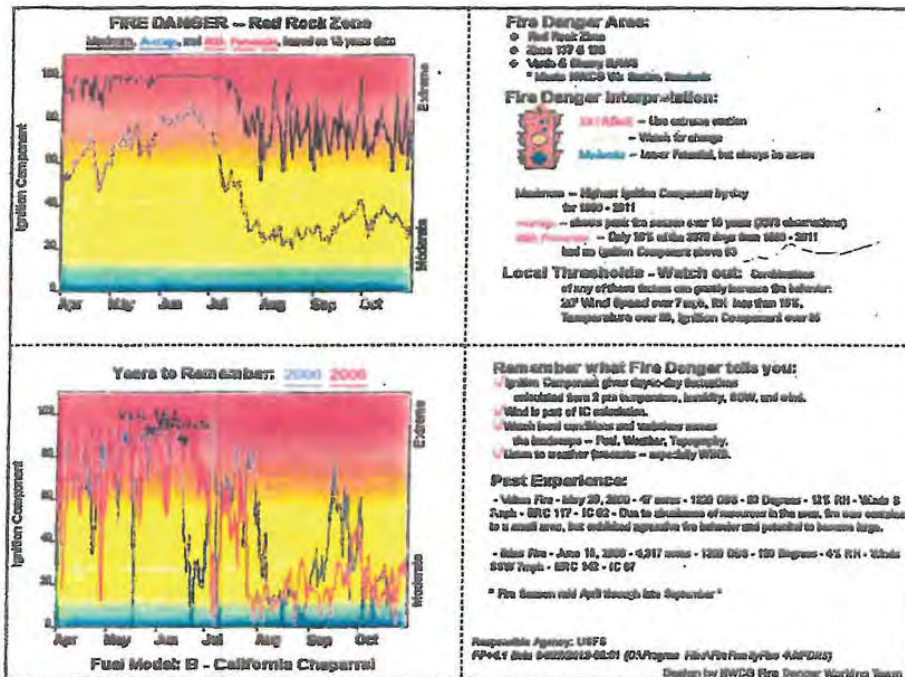
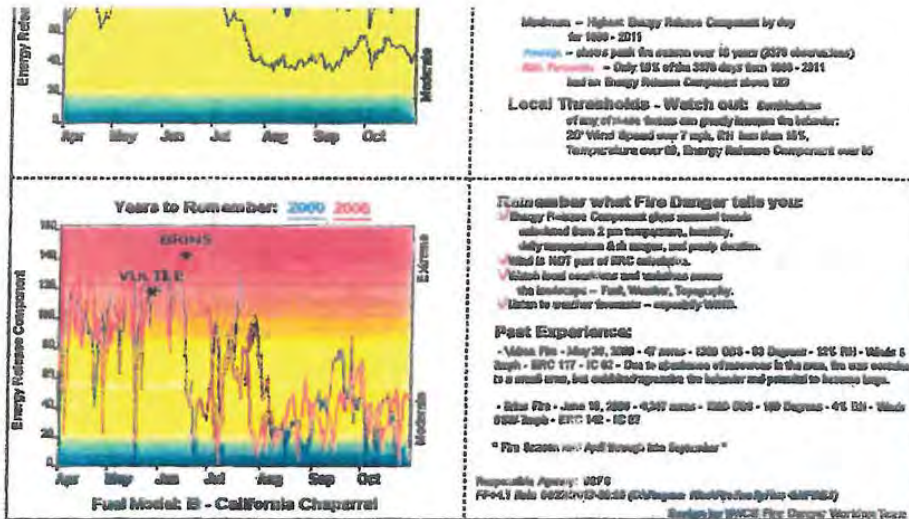
NORTH NON-FIRE GROUP (2) FLAGSTAFF RD			
CHANNEL	LABEL - NAME	RX Freq	TX Freq
1	SOUTH DIRECT	171.425	171.425
2	COF A/G	171.425	164.875
3	EAST POCKET	171.425	164.875
4	SOUTH ALIN	171.425	164.875
5	HUTCH	171.425	164.875
6	COF A/G	171.425	164.875
7	MINGUS	171.425	164.875
8	BAKER BUTTE	171.425	164.875
9	MOQUILLO	171.425	164.875
10	FOSSIL	171.425	164.875
11	TAC 1	167.550	167.550
12	TAC 2	168.675	168.675
13	TAC 3	168.775	168.775
14	MUTUAL AID	154.280	154.280
15	COF A/G	171.575	171.575
16	TRAVEL	168.350	168.350
17	AIR GUARD	168.625	168.625

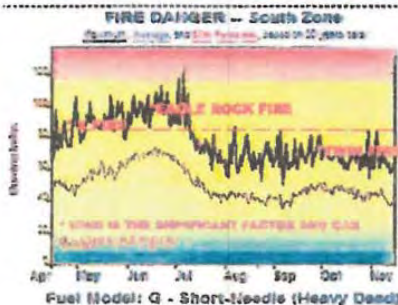
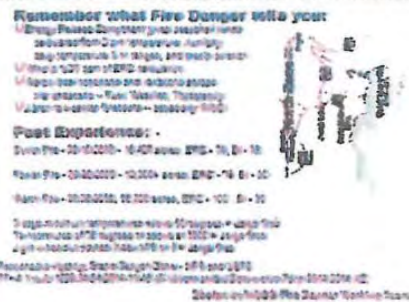
SOUTH NON-FIRE GROUP (3) - RED ROCK/MOGOLLON RD			
CHANNEL	LABEL - NAME	RX Freq	TX Freq
1	SOUTH DIRECT	172.300	172.300
2	MINGUS	172.300	164.875
3	SQUAW PEAK	172.300	164.875
4	EAST POCKET	172.300	164.875
5	BAKER BUTTE	172.300	164.875
6	HUTCH	172.300	164.875
7	SCHNEBLY	172.300	164.875
8	MOQUILLO	172.300	164.875
9	FOSSIL	172.300	164.875
10	TAC 1	167.550	167.550
11	TAC 2	168.675	168.675
12	TAC 3	168.775	168.775
13	MUTUAL AID	154.280	154.280
14	COF A/G	171.575	171.575
15	TRAVEL	168.350	168.350
16	AIR GUARD	168.625	168.625

*****Groups 2 and 3 above are NOT Tone Selectable**

Mogollon Rim Zone Pocket Cards





[illegible]

Authorization ID: COC0541
Contact ID: DEPT_OF_DEFENSE
Expiration Date: 06/13/2015
Use Code: 431

FS-2700-25 (01/2014)
OMB NO. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
Forest Service
TEMPORARY SPECIAL - USE PERMIT
(FSH 2709.11, sec. 53.13a)
AUTHORITY:
ORGANIC ADMINISTRATION ACT June 4, 1897

DEPARTMENT OF DEFENSE, hereinafter called the Holder, is hereby authorized to use, subject to the terms and conditions of this permit, National Forest System land identified within the unit area and described as Sec. 27, T. 18 N., R. 9 E., GILA AND SALT RIVER MERIDIAN, as shown on the attached Exhibit(s) 1 and 2 and Appendix A and B. This authorization covers approximately 25000 acres.

The holder is authorized to conduct the following activities and/ or install the following temporary improvements on the permitted area on lands administered by the Coconino National Forest:

ANGEL THUNDER is the National Personnel Recovery Exercise for the United States which provides for Non-Conventional Assisted Recovery actions during military exercise utilizing Air Force and local law enforcement officers. This exercise provides for recovery of isolated personnel in areas where conventional recovery capabilities do not exist, are not feasible, or are not acceptable. The training area is located within lands administered by the Coconino National Forest as shown in Figures 1 (Proposed military training area), 2 (Wildlife restrictive areas) and Figures 3A thru 3G (Travel lanes) and in accordance with Appendixes A (Angel Thunder 2015 - Coconino National Forest Stipulations) and B (2015 Visiting Flight Crew Aviation Briefing Packet). Military and volunteer participants will be transported via the use of helicopters, vehicles, or horseback. This authorization also includes the use of the Mormon Lake Helibase.

TERMS AND CONDITIONS

1. Use under this permit shall begin on 06/02/2015 and end on 06/13/2015. The permit shall not be extended.
2. The fee for this use is exempted.
3. The holder shall conduct the authorized activities according to the attached approved plans and specifications, Exhibit(s) Figures 1, 2 and 3A thru 3G and Appendixes A and B.
4. The holder shall not install any improvements not specifically identified and approved above.
5. No soil, trees, or other vegetation may be destroyed or removed from National Forest System lands without specific prior written permission from the authorized officer.
6. The holder shall comply with all Federal, State, county, and municipal laws, ordinances, and regulations which are applicable to the area or operations covered by this permit.
7. The holder shall maintain the improvements and premises to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer. The holder shall fully repair and bear the expense for all damage, other than ordinary wear and tear, to National Forest System lands, roads and trails caused by the holder's activities.
8. The holder has the responsibility of inspecting the use area and adjoining areas for dangerous trees, hanging limbs, and other evidence of hazardous conditions which would pose a risk of injury to individuals. After securing permission from the authorized officer, the holder shall remove such hazards.
9. The holder shall be liable for any damage suffered by the United States resulting from or related to use of this permit, including damages to National Forest resources and costs of fire suppression.

10. The holder shall hold harmless the United States from any liability from damage to life or property arising from the holder's occupancy or use of National Forest lands under this permit.
11. The holder agrees to permit the free and unrestricted access to and upon the premises at all times for all lawful and proper purposes not inconsistent with the intent of the permit or with the reasonable exercise and enjoyment by the holder of the privileges thereof.
12. This permit is subject to all valid existing rights and claims outstanding in third parties.
13. This permit may be revoked upon breach of any of the conditions herein or at the discretion of the authorized officer. Upon expiration or revocation of this permit, the holder shall immediately remove all improvements except those owned by the United States, and shall restore the site within five day(s), unless otherwise agreed upon in writing. If the holder fails to remove the improvements, they shall become the property of the United States, but that will not relieve the holder of liability for the cost of their removal and restoration of the site.
14. This permit is a license for the use of federally owned land. It does not grant any interest in real property. This permit is not transferable. The holder shall not enter into any agreements with third parties for occupancy of the authorized premises and improvements.
15. Appeal of any provisions of this permit or any requirements thereof shall be subject to the appeal regulations at 36 CFR 214 or revisions thereof.
16. This permit is accepted subject to the conditions set forth herein, condition(s) 1 thru 23 and Exhibit(s) Figures 1, 2 and 3A thru 3G and Appendixes A and B attached to and made a part of this permit.
17. The above clauses shall control if they conflict with additional clauses or provisions.
18. Cultural Resources Protection (D001RO). The holder, contractor, or lessee shall be responsible for the protection from damage of all identified cultural resources within the area which may be affected by their actions. In addition, the holder, contractor, or lessee shall be liable for all damage or injury to the identified cultural resources caused by their actions. The holder, contractor, or lessee shall immediately notify the agency Project Administrator if any damage occurs to any cultural resource and immediately halt work in the area in which damage has occurred until approval to proceed has been granted by the Project Administrator after consultation with the Forest Archeologist. All provisions of the Region 3 Cultural Resources Damage Assessment Handbook are incorporated by reference herein.
19. Native American Grave Protection and Repatriation Act (X003RO). Pursuant to the Native American Grave Protection and Repatriation Act (NAGPRA) 25 USC 3002(d); 43 CFR Part 10.4, if any human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during the course of ground disturbing activity, the holder will immediately cease activity in the area of the discovery and will make a reasonable effort to protect the remains and objects. The holder will provide immediate telephone notification of the discovery to the Forest Service, and will follow up with written confirmation to the authorized officer. The holder will not resume the activity that resulted in the discovery until the authorized officer gives written approval. Approval to resume the activity, if otherwise lawful, will be given thirty (30) days after certification by the authorized officer of the holder's written confirmation of the discovery, or at any time that a written binding agreement is executed between the Forest Service and the affiliated tribes adopting a recovery plan for the remains and objects.
20. Surveys, Land Corners (D4). The holder shall protect, in place, all public land survey monuments, private property corners, and Forest boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of the privileges permitted by this authorization, depending on the type of monument destroyed, the holder shall see that they are reestablished or referenced in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) the specifications of the county surveyor, or (3) the specifications of the Forest Service.
- Further, the holder shall cause such official survey records as are affected to be amended as provided by law. Nothing in this clause shall relieve the holder's liability for the willful destruction or modification of any Government survey marker as provided at 18 U.S.C. 1858.

21. **LOSS OF AUTHORIZED IMPROVEMENTS.** If authorized temporary improvements in the permit area are destroyed or substantially damaged, the authorized officer shall conduct an analysis to determine whether the improvements can be safely occupied in the future and whether rebuilding should be allowed. If rebuilding is not allowed, the permit shall terminate.

22. **HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION.** The holder shall take all measures necessary to protect the environment, natural resources, and the health and safety of all persons affected by the use and occupancy authorized by this permit. The holder shall promptly abate as completely as possible and in compliance with all applicable laws and regulations any physical or mechanical procedure, activity, event, or condition existing or occurring before, during, or after the term of this permit, and arising out of or relating to any activity, event, or condition existing or occurring during the term of this permit, that causes or threatens to cause a hazard to workers' safety or to public health or safety or harm to the environment (including but not limited to areas of vegetation or timber, fish or other wildlife populations, their habitats, or any other natural resources). The holder shall prevent impacts to the environment and cultural resources by implementing actions identified in the operating plan to prevent establishment and spread of invasive species. The holder shall immediately notify the authorized officer of all serious accidents that occur in connection with such activities. The responsibility to protect the health and safety of all persons affected by the use and occupancy authorized by this permit is solely that of the holder. The Forest Service has no duty under the terms of this permit to inspect the permit area or operations and activities of the holder for hazardous conditions or compliance with health and safety standards.

23. **LIABILITY FOR INJURY.** As an agency of the United States, the holder is limited by federal law as to the assumption of liability for its acts or omissions. The holder agrees, within its legal limitations and limitations of appropriations, to be responsible for all damages arising from injury to persons or property associated with the use and occupancy authorized by this permit. The holder further agrees, to the extent legally permissible, to use its appropriations and resources as required to pay any claims and to repair damage to the federal lands covered by this permit. The Forest Service is exempt from any burdens, other than administrative costs, which may arise in connection with the use and occupancy authorized by this permit.

I have read and understand the terms and conditions and agree to abide by them.

HOLDER: DEPARTMENT OF DEFENSE

U. S. DEPARTMENT OF AGRICULTURE
Forest Service

By: 
Major James M. Tuthill
Address: 3575 S Phoenix St Bldg 4837
Davis Monthan AFB, AZ 85707

By: 
Name: Scott Russell
Title: Acting Forest Supervisor
(Authorized Officer)

Phone #: (520) 228-5157

Date: 4/24/2015

Date: 4/24/15

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0598-0082. The time required to complete this information collection is estimated to average one (1) hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9892 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.



**PIMA COUNTY BOARD OF SUPERVISORS
DISTRICT 3**

130 WEST CONGRESS STREET, 11TH FLOOR
TUCSON, ARIZONA 85701-1317

(520) 724-8051
district3@pima.gov

**SHARON BRONSON
CHAIR**

April 3, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

Re: Angel Thunder Training Activity at Davis-Monthan Air Force Base

Dear Ms. Divine:

We write to you in response to the Environmental Assessment and in support of the Angel Thunder training activity at Davis-Monthan AFB. Davis-Monthan has been a community asset for decades and has been an exceptional community partner. One of the key partnerships has been the integration of military and local public safety organizations, including Raytheon, as they jointly train to address a wide range of emergencies and disasters. Davis-Monthan is also a partner in the Pima County Wireless Integrated Network (PCWIN) which is a county-wide public safety radio system serving local and federal agencies and we also share a common WebEOC Emergency Management System. In particular, we are most grateful for the assistance provided by the 563rd Rescue Group at Davis-Monthan for rescuing three survivors and recovering one fatality from a precarious mountainside when a Pima County Sheriff's Department helicopter crashed in 2012 while investigating mountaintop antenna sites for PCWIN. Quick response and integrated communications systems have allowed Pima County and regional jurisdictions to benefit in many ways from the presence of the world's ultimate Personnel Recovery experts.

Davis-Monthan has a number of advantages that make Arizona an ideal training site for a comprehensive training activity like Angel Thunder. Not only is nearby terrain and weather very similar to that found in current forward theaters, proximity to the Pacific Ocean and Arizona's lakes allows access to open water training operations as well. The weather

Ms. Robin Divine

Re: **Angel Thunder Training Activity at Davis-Monthan Air Force Base**

April 3, 2017

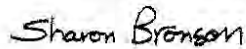
Page 2

provides maximum flying time and the proximity to the Barry M. Goldwater Range and the many nearby Military Operations Areas (MOA) offer a wide range of terrain while minimizing transit time and cost and maximizing Personal Recovery training opportunities across diversified training situations.

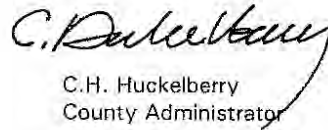
One other factor for consideration is that Pima County offered to include a \$30 million Bond program to voters that would provide a noise mitigation program in the Julia Keen neighborhood (near DM). The program was the same as was successfully implemented at Tucson International Airport. The Julia Keen Neighborhood Association representative is on record as informing the Pima County Bond Advisory Committee that the neighborhood did not want that program and preferred that a bordering street be widened instead.

The surveys show that over 90 percent of Pima County constituents living close to Davis-Monthan support Davis-Monthan's wide range of operations and the positive impact that the base personnel have on the community. Pima County fully supports the location of the Angel Thunder operation at Davis-Monthan and across the region and supports the Finding of No Significant Impact (FONSI) as the Record of Decision for the Angel Thunder Environment Assessment.

Respectfully submitted,



Sharon Bronson
Chair, Pima County Board of Supervisors


C.H. Huckelberry
County Administrator



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

REGION V, 555 N. GREASEWOOD ROAD, TUCSON, AZ 85745

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KURT R. DAVIS, PHOENIX

DIRECTOR

LARRY D. VOYLES

DEPUTY DIRECTOR

TY E. GRAY



April 4, 2017

ATTN: ANGEL THUNDER EA COMMENT
355th Fighter Wing Public Affairs
3405 S Fifth Street
Davis-Monthan AFB, Arizona 85707

Re: Draft Environmental Assessment, Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States

Dear Madam/Sir:

Upon review of the Draft Environmental Assessment (EA) for the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States, the Arizona Game and Fish Department (Department) offers the below comments for your consideration in preparing the Final EA.

The Draft EA acknowledges the potential occurrence of the Mexican spotted owl near several of the proposed training sites. We support the impact avoidance measure in the Draft EA: "To avoid impacts on this species, training activities at the Canelo, Devon, Mesa, Mount Lemmon, Ranger, and Saddle Mountain West sites should be avoided from February 1 through August 31 to avoid breeding and nesting season, when owls are most vulnerable". However, Table 5-1 indicates Potential Biological Restrictions for Canelo, Devon, Mesa, Mount Lemmon, and Ranger sites of March through June, and for Saddle Mountain West of March through July. For clarity, we suggest you ensure all references to avoidance periods are consistent throughout the document. 

In addition to avoidance periods for the federally listed species, please include avoidance for nesting bald and golden eagles. All sites with potential for nesting eagles should be avoided during the eagle breeding season of February 1 through June 31. The Mesa site is in close proximity to documented golden eagle nests. Avoiding use of this site during the entire eagle breeding season would also avoid any potential disturbance to Mexican spotted owl and lesser long-nosed bat, as already identified in the draft EA. Therefore, the avoidance period for Mesa should be February through June. The draft EA indicates that sites near bald eagle nests already take into consideration the appropriate avoidance period for breeding eagles. 

The Salt River Saguaro Lake Ranch site is near bald eagle nesting sites as well as a bat colony. Avoiding use of this site from February through August, as indicated in the draft EA should be adequate to avoid impacts to nesting bald eagles and the bat colony.

Number: 1	Author: MSHELBY	Subject: Sticky Note	Date: 4/24/2017 1:49:04 PM
The suggested corrections have been made in Section 5.3, Table 5-2, under "Southern Arizona - U.S. Forest Service (USFS)." The text referenced by the commenter can be found in Section 4.4.1.1, U.S. Forest Service subsection, paragraphs 14 - 15.			
Number: 2	Author: MSHELBY	Subject: Sticky Note	Date: 4/24/2017 1:39:34 PM
The potential biological restrictions time frame provided for Mesa in Section 5.3, Table 5-2, under "Southern Arizona - U.S. Forest Service (USFS)" is February through August in order to cover the Mexican spotted owl nesting and breeding season per the paragraph above. This avoidance period includes the appropriate avoidance period for nesting eagles and the lesser long-nosed bat.			
Avoidance during the eagle breeding season at Mesa is discussed in Section 4.4.1.1, U.S. Forest Service subsection, paragraph 7.			
Potential for the lesser long-nosed bat to be present at Mesa is discussed in Section 4.4.1.1, U.S. Forest Service subsection, paragraph 20.			

ANGEL THUNDER EA COMMENT

2

April 4, 2017

Thank you for the opportunity to provide comments on the proposed action. Please send any additional information requests to our Project Evaluation Program at PEP@azgfd.gov. For any questions specific to this letter, please contact me directly at kterpening@azgfd.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Kristin Terpening", with a stylized flourish at the end.

Kristin Terpening
Habitat Specialist, Region V

Cc: Laura Canaca, Project Evaluation Program Supervisor
Kevin Wakefield, Davis-Monthan AFB

M17-03064510

From: Richardson, Scott [mailto:scott_richardson@fws.gov]
Sent: Tuesday, April 11, 2017 11:22 AM
To: BREWSTER, CHRISTOPHER L GS-13 USAF ACC 355 CES/CEI <christopher.brewster@us.af.mil>
Cc: ken_mcgowan@fws.gov; DIVINE, ROBIN D CIV USAF AFMC AFCEC/CZN <robin.divine@us.af.mil>; WAKEFIELD, KEVIN L GS-11 USAF ACC 355 CES/CEIE <kevin.wakefield.1@us.af.mil>; DEUTSCH, KARL R GS-12 USAF ACC 355 CES/CEIA <karl.deutsch.2@us.af.mil>; Jeff Servoss <jeff_servoss@fws.gov>
Subject: [Non-DoD Source] Re: Angel Thunder Exercise Environmental Assessment Comments

Mr. Brewster and Mr. Wakefield,

Our staff has done a cursory review of the Angel Thunder EA. At this point, we have no comments on the proposed action. We look forward to coordinating with you on this project should you determine that section 7 consultation under the Endangered Species Act is appropriate. Thank you for the opportunity to provide input on this EA.

Please contact me if you have any questions or if we can be of any further assistance.

Sincerely,

Scott Richardson
U.S. Fish and Wildlife Service
Tucson Suboffice
(520) 670-6150 x 242

On Tue, Apr 11, 2017 at 8:45 AM, BREWSTER, CHRISTOPHER L GS-13 USAF ACC 355 CES/CEI <christopher.brewster@us.af.mil> wrote:

Mr. Richardson/Mr. McGowan,

Sirs, have you sent Mr. Wakefield any comments regarding the Angel Thunder EA? If you have, please forward those comments to Ms. Divine and myself today. I'm asking on Mr. Wakefield's behalf as he has been out of the office for his daughter's wedding so I can't access his e-mails.

If you have not yet completed the comments and/or they are still in circulation, then the window has closed due to the project timeline and comment period. Because DM values the USFWS' comments and mission, we would still like to know what those comments are as we want to ensure to minimize or eliminate impacts to natural resources, fish, and wildlife.

Thank you in advance.

Christopher L. Brewster, PE
Flight Chief, Installation Management
Davis-Monthan AFB, 355 CES/CEI
3775 S. Fifth Street
Tucson, AZ 85707
DSN: 228-7201
Comm: (520) 228-7201
Mobile: (423) 619-4484
christopher.brewster@us.af.mil



Doug Ducey
Governor

ARIZONA STATE PARKS & TRAILS

Celebrating 60 Years!

Sue Black
Executive Director



April 11, 2017

Colonel Scott C. Campbell
Vice Commander, 355th Fighter Wing
3405 S Fifth Street
Davis Monthan Air Force Base, AZ 85707



E-MAILED

4-11-17

Attention: Kevin Wakefield, Base Natural and Cultural Resource Manager

RE: Angel Thunder Personnel Recovery/Rescue Training Exercise Project; Arizona, New Mexico, California; DOD-AF, USFS, ASLD, private, municipal; SHPO 2016 – 1271 (135753)

Dear Colonel Campbell:

Thank you for continuing to consult with our office regarding the above referenced project. Pursuant to 36 C.F.R. Part 800, the implementing regulation for Section 106 of the National Historic Preservation Act, we have reviewed the documentation submitted, *Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States: Section 106 of the National Historic Preservation Act – No Historic Properties Affected Determination for Exercise Locations in Arizona*, and have the following comments:

1. It is our understanding that the United States Air Force (USAF) is proposing to expand their Air Combat Command's Angel Thunder Personnel Recovery/Rescue Training Exercise centered on Davis-Monthan AFB. We further understand that the exercises associated with this proposed training incorporate multiple states and multiple jurisdictions, including private, state, and federal lands in Arizona, New Mexico, Nevada, and California. The proposed project will increase the number of personnel, frequency of training, and locations of training. Essentially, this project will become biannual, combining training for pararescue combat aircrews with additional intelligence personnel, battle managers, and joint search and rescue center personnel in multiple areas around Arizona and other adjacent states. Activities would include landing zones (LZs), helicopter landing zones (HLZs), drop zones (DZs), forward aircraft refueling points (FARPs), and miscellaneous activities comprising mostly classroom training, establishment of shooting ranges, etc. USAF is the lead federal agency for this undertaking.

It is our understanding that the undertaking identifies 139 DOD and non-DOD locations that could serve as training locations, but not every one may be used each year. Of the 139 locations, 110 are located in Arizona.

2. The project's area of potential effect (APE) includes a 330 – foot radius around proposed training locations. Ground transportation of personnel to and from locations

would use existing access roads, both paved and unpaved. The proposed project will not include road improvement activities, off-road use, or new road construction. The USAF indicated that access roads are not included in the project's APE, *because* the level of use is not anticipated to impact historic properties (Letter from Colonel Scott C. Campbell to Kris Powell, dated 3-6-17). However, the entire area associated with the undertaking needs to be included in the study, regardless of anticipated impact level so that indirect and cumulative effects are considered. Please redefine the APE to include non-paved access roads in your Class I inventory. 

3. The USAF has determined that this project would have a finding of "No Historic Properties Affected." We cannot concur with your finding at this time because additional information is needed to fully evaluate the undertaking's effect on historic properties. Specifically, we have concerns regarding the adequacy of the inventory effort for this undertaking. Our concerns are outlined in items #4 and #5, below:
4. Table 1, *Record Search Results for Proposed Training Locations on USFS and Miscellaneous Properties in Arizona*, provides information as to whether each proposed location had been previously surveyed for cultural resources and if known cultural resources are present within the area of potential effect. We are concerned that this Table may not be complete, as per the following:

For the 110 locations in Arizona, 35 are included on military installations. Although the Table denotes references to some survey reports, no cultural resources are identified for those locations, only the phrase, "currently used for training." The location of AUX 6 on the BMGR East contains AZ Z:1:29(ASM)/Mobak Site and the Gila Bend Air Force Auxiliary Base contains several sites that recently witnessed some data recovery. 

The Environmental Assessment for the project (pg 3-73) indicates that the proposed action would "result in a negligible increase in existing operations at these training sites; therefore, cultural resources on military installations in southern Arizona are not discussed." As mentioned previously in this letter, all parts of the project within the APE must be addressed, regardless of the anticipated project impacts. Please review the DOD Report cited above and revise Table 1 to include all sites previously recorded in the project APE. 

Some of the previous surveys in the Table appear to be more than 10 years old, and there is no evaluation as to whether they are still valid surveys (See SHPO Guidance Point No. 5, 2004, *SHPO Position on Relying on Old Archaeological Survey Data*, which can be found on our website at <https://azstateparks.com/shpo-guidance-2016-updates>). Please evaluate these surveys according to these SHPO guidelines. 

The Table also includes locations on USFS lands, private, state, and municipalities. Most of the USFS lands have not been previously surveyed for cultural resources, nor

Number: 1	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 9:56:05 AM
The USAF is pursuing additional Section 106 consultation with the appropriate SHPOs to ensure that the APE and all resources are properly identified. Additional information is provided in Section 4.5.1.6, paragraphs 3-4.			
Number: 2	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 10:10:51 AM
Due to the varied state of completion of surveys across the many military installations, additional consultation would be required prior to implementation of the individual exercises to ensure that the APE and all resources are properly identified. Additional information is provided in Section 4.5.1.6, paragraph 4.			
Number: 3	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 10:10:56 AM
The USAF is pursuing additional Section 106 consultation with the appropriate SHPOs to ensure that the APE and all resources are properly identified. Additional information is provided in Section 4.5.1.6, paragraph 4.			
Number: 4	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 10:14:39 AM
USAF recognizes that old surveys may not meet today's standards and may have missed sites. Most of the previous surveys at proposed training sites are more than 10 years old and may require additional survey to be certain whether sites are present or not. The USAF suggests proceeding with a no effect determination for sites that do not require additional survey and do not have cultural resource concerns. For the remaining sites, the USAF would conduct cultural resource surveys and further consultation on potential effects prior to their approval for use in the Angel Thunder exercise. Please see Section 4.5.1.6, paragraph 4.			

have most of the other jurisdictions. There is no discussion on whether any cultural resource studies are planned for those locations that have not been previously surveyed for cultural resources. Please describe your efforts to complete the inventory (identification and evaluation) phase of the project. 1

Please correct the Table by removing “none” from the “Identified Cultural Resources Column” for properties that were not previously surveyed and replacing it with “unknown.” A “none” label can misleadingly indicate that area is devoid of cultural resources. 2

5. Historic properties have been identified within the undertaking’s APE, but there is no discussion regarding measures to avoid, minimize or mitigate the potential impacts to these properties. (As always, we encourage agencies to avoid sites whenever possible, and, since these training activities have some flexibility, we recommend that the USAF avoid known historic properties.) Instead of the above discussion, the USAF provides an assessment of the likelihood of different types of activities to have negligible impacts to the existing properties. This discussion does not include an assessment on effect to properties not yet known. The two types of activities that need more explanation on potential impacts include the HLZs and the DZs. USAF argues that the HLZs are located only within existing helicopter landing areas and any wind or dust would be minimal and would not be expected to adversely affect historic Register-eligible historic properties. However, archaeological resources are often determined eligible under Criterion D. The two aspects of integrity that are crucial to Criterion D properties are materials and location. Given that rotor wash from helicopters can produce extreme winds in upwards of 20 to 40 miles per hour within 50 feet of the helicopter (Lesse et al. 1974, Table 1, pg 13), we are concerned that the severe winds from rotor wash could adversely affect the location of materials on Criterion D-eligible sites. Please provide a more detailed analysis on the potential impacts to Criterion D-eligible sites within 50 feet of HLZs. 3

Additionally, the USAF indicates that DZs would have no impacts to historic properties because the dropped materials would be landing in water. However, significant archaeological properties are often found in close proximity to water. It is assumed that the supplies that are dropped into the water will be retrieved and relocated to solid ground. As such, background research should include the areas surrounding DZs (with natural water sources) to assess the presence of known archaeological sites. If Register-eligible historic properties exist in these areas, we would request that these areas be flagged and avoided during retrieval of dropped supplies.

There are several areas where no surveys have been conducted and little discussion on how to address any unanticipated discoveries. Please include a discovery plan that outlines the processes that will be followed for a discovery, including documentation

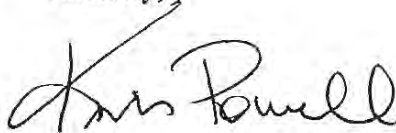
Number: 1	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 10:18:26 AM
The USAF has determined that additional consultation will be required for certain training sites before they are used. Those training sites would include off-installation training sites that have not had complete, recent survey and are not otherwise disturbed to preclude the possibility for sensitive cultural resources. The table in Appendix H has been split into two tables these two categories: sites that can be approved for use now, and sites that will require survey and additional consultation. Please see Section 4.5.1.6, paragraph 4 and Tables H-1 and H-2.			
Number: 2	Author: ELECLERC	Subject: Sticky Note	Date: 4/26/2017 9:33:41 AM
Table revised per recommendation, please see Tables H-1 and H-2 in Appendix H.			
Number: 3	Author: ELECLERC	Subject: Sticky Note	Date: 4/25/2017 11:43:49 AM
As stated in Section 4.5.1.6, paragraph 4, USAF proposes a "no historic properties affected" determination for all training sites on military installations and off-installation sites that have either been completely surveyed in the last 10 years or where previous disturbance or development indicate no effects are likely (i.e., training at existing airports or a heavily disturbed quarry). Please see Tables H-1 and H-2 in Appendix H. One lists sites where activities could proceed without additional survey, and the other lists training sites where additional work is needed.			

of the find, evaluation of the eligibility, consultation with consulting parties, and determination of effects, if the discovery is eligible for the NRHP 

As indicated earlier, the State Historic Preservation Office is not able to concur with the USAF's determination of effect at this time. We look forward to reviewing a revised analysis document of the Angel Thunder Personnel Recovery/Rescue Training Exercise which contains a full assessment of the APE, and comprehensive efforts to identify historic properties within the APE. This information will assist us in providing review of USAF's compliance under Section 106 of the National Historic Preservation Act.

As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, then please do not hesitate to contact me via e-mail, kpowell@azstateparks.gov, or by phone, 602-542-7141.

Sincerely,



Kris (Dobschuetz) Powell, MA, RPA
Compliance Specialist/Archaeologist

Cc: Adrienne Rankin, Luke AFB
Marty Tagg, Fort Huachuca
Shelby Manney, DEMA
Matthew Behrend, ASLD
William Reed, USFS

Lesse, Grady W. et. al
1974 Helicopter Downwash Data. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. National Technical Information Services, U.S. Dept of Commerce.

Number: 1 Author: ELECLERC Subject: Sticky Note Date: 4/28/2017 11:49:49 AM

Comment addressed in Section 4.5.1.7. Unanticipated discoveries that occur at training sites on military installations will follow the procedures outlined in the installation's Integrated Cultural Resources Management Plan or Integrated Natural Resources Management Plan, as appropriate. Procedures for unanticipated discoveries at training sites on U.S. Forest Service or miscellaneous properties will follow the Discovery Plan outlined in Davis Monthan AFB's Integrated Natural Resources Management Plan.

U.S. Forest Service Comments and Notes on Angel Thunder Proposed Sites

Apache-Sitgreaves NFs

General Comments about the proposed action:

Further clarification needed on numbers of folks on the ground during exercises on the ground on the Apache-Sitgreaves National Forests (ASNFs) timing (biannual? Month/s?), frequency (every/twice a year into the future?); how far generally will the members of the exercise range from the identified sites on the ground?

Describe the activities in greater detail (NAR, CZAR, and?) that would occur on the ASNFs.

The maps in the appendix are confusing and not clear on where the activities would actually occur. We received a spreadsheet with coordinates for the locations.

Updated Contact Info

1. District Ranger for Alpine Ranger District is Ed Holloway, 928-339-5010, eholloway@fs.fed.us.
2. KP Circular and KP Tank were *not* listed on the DMAFB spreadsheet of coordinates.
3. Map 25 points to 4 locations that are geographically separated on the ground, but the map shows them all at the same location (the 2 listed in #1, Hannagan Meadow USFS Helitack Base, and Heli-Base Circular). Please clarify map.
4. Define what the Heli-base and KP Circulars are (size/area)?
5. The coordinates for Caldwell Meadows indicate the location on PS Ranch which is owned by Arizona State Game and Fish, not ASNFs. AZGF contact at PS Ranch/cabin is Dave Cagle at dcagle@azgfd.gov.
6. Contact person for fire management (Helitack/Helibase) for Alpine Ranger District is now Chris Johnson, 928-339-5031, cjohnson15@fs.fed.us.
7. Sprucedale Guest Ranch is owned privately, not ASNFs (has correct contact person for the ranch is on the DMAFB spreadsheet of coordinates, but mentions location as ASNFs). Does the operation from Sprucedale Guest Ranch extend onto the ASNFs?
8. Contact person for Caldwell Cabin is Barbara Romero and Jessica Durst (below), 928-333-6205, bromero01@fs.fed.us.
9. Special Uses Recreation staff contact person in Alpine Ranger District: Jessica Durst at 928-339-5052 or jldurst@fs.fed.us.

Commented [FN1]: Comment bubbles correspond to changes made in the document. If a comment bubble appears in a header, it addresses multiple bulleted points below.

Commented [FN2]: Comment regarding number of personnel is addressed in Section 2.1.1, paragraph 3.

Comment regarding the timing of the Proposed Action is addressed in Section 2.1, paragraph 1 and Section 2.1.1, paragraph 1.

Commented [FN3]: Comment is addressed in Section 2.1.3, paragraph 2, which discusses how USAF will coordinate with each district ranger on a case-by-case basis due to the varying requirements of each training activity. Additional training and site details will be provided during the training site review and survey in conjunction with special use permits.

Commented [SM4]: Comment addressed in Section 2.1.1, paragraph 3 and Sections 2.1.1.1 and 2.1.1.2, which describe proposed training activities in detail.

Commented [FN5]: Comment addressed in updated Map 22 in Appendix C.

Commented [FN6]: Section 3.4.1, paragraph 3, provides general information on the size of training areas around proposed sites, including the helibase and KP Circular. Per Section 2.1.3, paragraph 2, USAF will coordinate with each district ranger on a case-by-case basis due to the varying requirements of each training activity. Additional specific site details, such as the size and area of the proposed site, will be provided during the training site review and survey in conjunction with the special use permit.

Commented [FN7]: Comment addressed in Table 2-1 under "Northern Arizona - Miscellaneous" Controlling Agency column.

Commented [FN8]: Comment addressed in Table 2-1 under "Northern Arizona - Miscellaneous" Controlling Agency column.

Resource Specific Comments

Wildlife: More information is needed on what the CSAR and NAR entail. These are the activities where they do search and rescue. Details are needed such as the number of personnel and locations, time of year, etc. The map scale is too large, it needs to be of smaller scale and much more specific. A search and rescue that possibly involves hundreds of people in the woods during Mexican Spotted Owl (MSO) breeding season is of concern. Many of the locations occur in or in the vicinity of designated critical habitat for MSO.

Aquatics: Potential impacts to KP Cienega (adjacent to KP Tank), or other wetland areas in this vicinity. Not having a detailed description of activities on USFS lands it is hard to determine effects to these sensitive areas.

Timber: Timber/roads has no concern, need to change contact information for spread sheet.

Recreation: Operations could certainly affect recreation in the proposed sites from USAF, depending on the timing and duration, noise (low flying aircraft), etc. Caldwell Cabin is a very popular destination and is booked through the season from late April through August. After the season is over it is closed and winterized, so it would not be available for use (unless the District Ranger made an exception). The Air Force would need to pay the daily rate and go through the proper reservation procedure to use the cabin itself in the summer season. Early and often coordination with recreation staff (Special Uses, Jessica Durst) from the Alpine Ranger District is critical.

Other potential conflicts would be operations in the vicinity of the KP Cienega Campground; Hannagan Meadow Lodge and campground (USFS, but run through a Special Use Permit from Alpine RD-just across from Hannagan Helitack base); Recreation staff would need give Larry Innes (manager of Hannagan Lodge) early notification of activities in the area, but he is usually most accommodating; also, a recreation trail running from Hannagan Lodge heading east passing by access road to Hannagan Helitack base. Sprucedale Ranch is also operated under a Special Use permit so working with the ranch manager and Recreation staff (Special Uses) is critical (early notification, etc.).

Operations could also conflict with hunting seasons on the ASNFs. This is a very popular area to hunt elk, deer, etc. Working with AZ Game and Fish (Pinetop, AZ office) would be suggested so USAF would be aware of when critical hunts are occurring.

Cultural: There are Heritage resource concerns for the Sitgreaves side of the Forests. The two areas provided in the locations spreadsheet show the exercises taking place in or very near cultural resource sites. Based on the information provided in the DOPAA, the following training activities are slated for the two Sitgreaves locations: Rotary Wing Terminal Area Ops, Parachute Ops, Dismounted Ground/Water Ops, Dismounted Ground/Water Movement, and Command, Control, Communications, Computers, and Intelligence Operations. Considering single points were provided for these activities and not polygons for areas that will contain such activities, I would be incredibly hesitant to green-light the current proposed action locations on the Sitgreaves side. I've attached screen shots of the areas of concern (for internal use only-in project file). On the "Sitgreaves1" jpeg the LZ is a fuchsia point and on the "Sitgreaves2" jpeg the LZ is a green point. Note how the LZ in "Sitgreaves2" is inside the site boundary.

Angel Thunder has been happening for quite a while but have all of these locations been used previously? Please add information on how many times the locations have been used previously

Commented [FN9]: See Section 2.1.3, paragraph 2, which discusses how USAF will coordinate with each district ranger on a case by case basis due to the varying requirements of each training activity. Limitations of each area will be considered and all USFS procedures would be followed. These limitations will be detailed in special use permits. Site-specific maps will be provided where necessary in special use permits.

Commented [FN10]: Comment addressed in Section 4.4.1.2, U.S. Forest Service subsection, paragraphs 12 and 13. Table 5-2 in Section 5.3 also includes potential biological restriction timeframes for sites where the MSO could be present.

Commented [FN11]: Comment addressed in Chapter 3, paragraph 4 (Water Resources). This paragraph provides reasoning for little to no impacts on KP Cienega.

Comments and Notes on Angel Thunder Proposed Sites

so we can adequately determine what impacts exist from past use to ascertain what potential impacts we can expect from continued use.

"Caldwell Meadows" is actually the old PS Ranch property under Arizona Game and Fish jurisdiction. There is a National Register eligible property (PS Ranch Irrigation System) that weaves back and forth between the Apache-Sitgreaves NFs and AZ Game and Fish Dept. lands. Hopefully this is addressed by AZ Game and Fish in their scoping response.

Caldwell Cabin area on the Apache side of the ASNFs - this historic cabin could potentially be effected by the vibrations caused by helicopter rotors. To mitigate such an effect, it is recommended that flying or hovering directly over the cabin should be avoided, to minimize the amount of time rotors are engaged at the LZ near the structure.

Generally, archeologists recommend providing educational information on ARPA and stewardship of cultural resources to personnel involved to mitigate any potential effects to sites by individuals.

Please let Stephanie Welch, know if you have any questions or need clarification at stephaniewelch@fs.fed.us or call 928-339-5079.

ASNFs Forest Plan Compliance Review:

ID	Latitude	Longitude	PNVT	Management Area	Critical Habitat	Occupied Habitat	Forest Orders	Proposed Activities ¹
Caldwell Cabins	33.74516700	-109.36858800	PPF	GF	MSO			2,3,4,5,6,7 DZ/HLZ
Hennagen Meadow USFS Helitack Base	33.63240000	-109.32605000	VMCF	GF	MSO			2,3,4,5,6,7 DZ/HLZ
Overgaard USFS Helitack Base	34.39823300	-110.56450000	PPF	CFI				2,3,4,5,6,7 DZ/HLZ
Black Mesa USFS Helitack Base	34.53830000	-110.91068300	PPF	GF	MSO			2,3,4,5,6,7 DZ/HLZ
KP Cienega Campground	33.57610833	-109.35542222	WCRA	GF	MSO		01-0401 (not enforced)	2,3,4,5 DZ/HLZ

¹ 1. Fixed-wing terminal area operations
 2. Rotary-wing terminal area operations
 3. Parachute operations
 4. Dismounted groundwater operations
 5. Dismounted groundwater movement
 6. Command, control, communications, computers and intelligence operations location
 7. Logistical beddown location
 8. Forward aircraft refueling point
 DZ=drop zone ("...insertion of pararescuemen in small squad units no greater than 8 to 12 personnel")
 HLZ=helicopter landing zone (used for landing of rotary-wing aircraft, primarily UH-60 Black Hawk)

I did not find the KP Tank or KP Circle points in the excel sheet we were provided by USAF, so I used the coordinates of the KP Cienega Campground from the forests' website. A tank is visible near the point on imagery, but I don't know if that is the one the USAF refers to in the Proposed Action.

Commented [FN12]: Comment addressed in updated Map 22 in Appendix C.

Forest Plan Consistency:

General: This proposed action would be conducted under a Special Use Permit. Plan direction for SUPs includes the following: "As applicable, issuance of special use authorizations should incorporate measures to reduce potential impacts to wildlife and avoid rare and unique habitats (e.g., bogs, fens)." (p. 102) Further, plan direction for Special Uses (DC, p. 101) states: "Lands where special use activities have occurred show little evidence of impacts." Four of the 5 proposed sites are in critical MSO habitat; one is in a riparian PNV. Permits issued for these activities should contain safeguards to ensure that the permitted activities are consistent with plan direction and applicable law, regulation, and policy. Because of the proposed use of three helitack bases on ASNFs and low-altitude aviation across the forests, the proposed action has

Commented [FN13]: Comment addressed in Section 7.1.3, paragraph 2. This paragraph states that use of any site would require a current special use permit that would be consistent with appropriate Forest Plans.

the potential to interfere with, or cause safety issues for, wildland fire suppression operations. Special use permits issued for this proposed action should contain provisions for managing potential conflicts of this type.

Caldwell cabin: This area is in General Forest MA and in Ponderosa Pine Forest PNVT. It lies in MSO critical habitat. The plan requires that "Activities occurring within federally listed species habitat should apply habitat management direction and species protection measures from recovery plans." (p. 26). Conflicts with recreational users would need to be mitigated by blocking out dates for rental of the cabin or by other measures.

Hannagan Meadow USFS Helitack Base: This location lies within Wet Mixed Conifer PNVT and is in the General Forest Management Area. It is adjacent to the Blue Range Primitive Area (distance = 92 m). The site is in MSO designated critical habitat, as noted above. It is a dedicated Helitack Base, and therefore the proposed activities should pose no issues for this site if issues with critical habitat and proximity to the Blue Range Primitive Area are addressed in the permit.

Overgaard USFS Helitack Base, Black Mesa USFS Helitack Base: These two locations are also dedicated helitack bases at which the proposed uses are consistent with their use by the Forest Service. Black Mesa Helitack Base is within MSO designated critical habitat. The Overgaard USFS Helitack Base lies within 250 m of private residences. Although it is not a plan consistency issue, night helicopter operations may cause unacceptable levels of disturbance.

KP Cienega Campground: As noted above, I substituted this location for the two "KP" locations in the proposed action because they were not included in the spreadsheet of coordinates. This area is in the Wetland Cienega Riparian Area PNVT. Plan direction for riparian areas includes: "Sedimentation and soil compaction from forest activities (e.g., vehicle use, recreation, livestock grazing) does not negatively impact riparian areas." (p. 34) "Wet meadows, springs, seeps and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation." (p. 36) "Storage of fuels and other toxicants should be located at least 100 feet outside of riparian areas to prevent spills that could impair water quality or harm aquatic species." (p. 36) Since the proposed activities for this area include rotary-wing terminal area operations, and dismounted activities can result in harm to riparian soils under wet conditions, any special use permit issued should contain safeguards to ensure that the activities will be consistent with this plan direction. Further, conflicts with recreational users will need to be managed at this location, since it is a campground. This site lies approximately 1.5 km from the boundary of the Blue Range Primitive Area.

For further clarification on resource concerns for the ASNFs please contact Sheila Williams, Apache Zone NEPA coordinator at sheilawilliams@fs.fed.us or 928-339-5055, or contact Ed Holloway, Alpine District Ranger at 928-339-5010, eholloway@fs.fed.us

Coconino NF

General Crook Location – is immediately adjacent to two Mexican spotted owl PACs that are on the Tonto. No activities would be allowed with 0.25 mile of those PACs (which includes the

Commented [FN14]: The Mogollon Rim (General Crook) and Jack's Canyon location conditions for the peregrine falcon have been added to Section 4.4.1.2, U.S. Forest Service subsection, paragraph 5.

The Mogollon Rim (General Crook) and Jack's Canyon location conditions for the Mexican spotted owl have been added to Section 4.4.1.2, U.S. Forest Service subsection, paragraph 13.

Also see Section 5.3, Table 5-2 under "Northern Arizona - USFS," for potential biological site restrictions.

Comments and Notes on Angel Thunder Proposed Sites

point provided) during the breeding season (March 1 – August 31st). There is also a peregrine nest ~0.8 mile to the west of the point provided, so the travel paths of flights would need to stay 0.5 mile from the nest during the breeding season (March 1st – August 15th).

Longview Helitack – no wildlife issues.

Jacks Canyon – there is a MSO PAC and a peregrine nest ~1.0 mile southwest of the coordinates provided for this location. While activities at the location would not have a timing restriction, the travel path of flights would need to stay 0.25 mile from the PAC and 0.5 mile from the peregrine nest during their respective breeding seasons.

Gila NF

Notes Common to all sites.

See last two pages for comments specifically related to cultural resources.

- Access by motor vehicles will need to be reviewed using current transportation layer to check for need of closed roads or if there may possibly be a need for cross-country access
- If damage or rutting to the surface of any Forest helispot or airstrip occurs during training activities, damage will immediately be repaired. The Forest Service Aviation Officer will be notified regarding damages and repairs or if repairs cannot be completed immediately.
- Silver City Dispatch Center will be contacted in advance and prior to beginning activities to coordinate flight activities; check for other planned flight activities occurring or upcoming in areas; check on fire or other emergency status.
- Notify the District Rangers when training activities are planned in order to be able to address public questions or concerns.
- Range improvements including such things as waters, fences, etc⁴⁴. will be avoided, repaired if damaged. If any damage occurs to improvements, District will be notified regarding damages and repairs or if repairs cannot be completed immediately.
- Be aware that there is active livestock grazing in and around all areas of the Forest, excluding District Offices and Work Stations
- Mexican gray wolves are present, especially in the Negrito area. Concern regarding disturbance especially during denning season.
- Aerial ops and Timing – using helipads during fire season could prove to be problematic – recommend schedule to come early (pre-May) or late (mid-July or later) especially for the following sites: Glenwood RD, Reserve RD, Negrito Airbase
- How many times per year would each site potentially be used; how many personnel per visit; how many days would sites be occupied?

Commented [FN15]: See Section 2.1.3, paragraph 2, which discusses how USAF will coordinate with each district ranger on a case-by-case basis due to the varying requirements of each training activity. Limitations of each area will be considered and all USFS procedures would be followed. These limitations will be detailed in special use permits.

Commented [FN16]: Comment addressed in Section 3.4.2.3, Federally Threatened and Endangered Species subsection, paragraph 3 and Section 4.4.1.3, U.S. Forest Service subsection, paragraph 5.

Commented [FN17]: Comment regarding how many times each site would be used biannually is addressed in Section 2.1.2, paragraph 3.

Comment regarding how many personnel would be present per visit is addressed in Section 2.1.1, paragraph 3.

Comment regarding how many days the sites would be occupied is addressed in Section 2.1.3, paragraph 2, which discusses how USAF will coordinate with each district ranger on a case-by-case basis due to the varying requirements of each training activity.

Comments and Notes on Angel Thunder Proposed Sites

Name	District	Training Activity	Comments/Notes
Glenwood RD	Glenwood	Drop Zone Helicopter Landing Zone 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Need to contact/notify district in advance (preferably 1 week) due to: - This location is a District Office and has residences on the compound. - Forest livestock (horses) are maintained within HLZ pasture or adjacent pastures periodically during the year - The helispot is visible from Hwy 180 and in close proximity to community of Glenwood and other small communities. This would provide advance notice for the District to ensure personnel, equipment, residents, and livestock are out of the way of training activities. Advance notice would assist in providing notice to the communities and able to address questions regarding helicopter and military presence on the compound. Need to contact / notify in advance to coordinate any project or emergency forest activities that may also be using the helispot and helicopters. Site is near Critical Habitat for: - Southwest willow flycatcher - Gila Chub - Loachminnow - Spike dace Site is near Proposed Critical Habitat for: - Narrow-headed garter snake. - Yellow billed cuckoo.
Reserve Ranger Station	Reserve	Drop Zone Helicopter Landing Zone 2 – Rotary-wing Terminal Area 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Need to contact/notify district in advance (preferably 1 week) due to: - This location is a District Office and has residences on the compound - The helispot is in close proximity to the community of Reserve. This would provide advance notice for the District to ensure personnel, residents and equipment are out of the way of training activities. Advance notice would assist in providing notice to the communities and able to address questions regarding helicopter and military presence on the compound.

Comments and Notes on Angel Thunder Proposed Sites

Name	District	Training Activity	Comments/Notes
			Need to contact / notify in advance to coordinate any project or emergency forest activities that may also be using the helispot and helicopters. Drainage to the north-east proposed critical habitat for narrow-headed garter snake and critical habitat for loachminnow (This is also applicable for Catron Fairgrounds site also)
Reserve Airport	Catron County	Drop Zone Helicopter Landing Zone 1 – Fixed-wing Terminal 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	NOTE: the Reserve Airport is on Forest Service lands and is under special use permit to Catron County to manage the facility. Permit should be reviewed for any specific points regarding allowed uses or authorizations.
Negríto Airstrip	Reserve	Drop Zone Helicopter Landing Zone 1 – Fixed-wing Terminal Area Ops 2 – Rotary-wing Terminal Area Ops 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Need to contact / notify in advance to coordinate any project or emergency forest activities that may be using the airstrip Airstrip used by recreational pilots Within Mexican spotted owl (MSO) critical habitat and is near or adjacent to PACs – may need seasonal restrictions Negríto South campground located west of the airstrip, flight path and noise concerns
Negríto Center	Reserve	Drop Zone Helicopter Landing Zone 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown	Forest Service does not have an existing designated helispot in this location. Within Mexican spotted owl (MSO) critical habitat and is near or adjacent to PACs – may need seasonal restrictions Negríto South campground located west of the airstrip, flight path and noise concerns. Have advance notice so can notify or post at the campground that training activities are taking place nearby.

Comments and Notes on Angel Thunder Proposed Sites

Name	District	Training Activity	Comments/Notes
		location	
Negrito Helibase	Reserve	Helicopter Landing Zone 2 – Rotary-wing Terminal Area 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Need to contact/notify district in advance (preferably 1 week) due to: This location is a District Work Center staffed seasonally and has residences on the compound. This would provide advance notice for the Work Center personnel to ensure personnel, residents and equipment are out of the way of training activities. Need to contact / notify in advance to coordinate any project or emergency forest activities that may also be using the helispot and helicopters. MSO PACs located west of helibase near Negrito Airstrip...may be an issue of flying over PACs if entering helibase from the west – may need seasonal restrictions.
Negrito North	Reserve	Drop Zone Helicopter Landing Zone 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Forest Service does not have an existing designated helispot in this location. Within Mexican spotted owl (MSO) critical habitat and is near or adjacent to PACs - may need seasonal restrictions
Negrito South	Reserve	Drop Zone Helicopter Landing Zone 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement 6 – Command, control, comm., computers, & intelligence ops location 7 – Logistical / Beddown location	Forest Service does not have an existing designated helispot in this location. Within Mexican spotted owl (MSO) critical habitat and is near or adjacent to PACs - may need seasonal restrictions

Comments and Notes on Angel Thunder Proposed Sites

Name	District	Training Activity	Comments/Notes
Rainy Mesa	Reserve	Helicopter Landing Zone 2 – Rotary-wing Terminal Area 3 – Parachute Operations 4 – Dismounted Ground/Water Ops 5 – Dismounted Ground/Water Movement	Forest Service does not have an existing designated helispot in this location. Within Mexican spotted owl (MSO) critical habitat and is near or adjacent to PACs - may need seasonal restrictions Proposed critical habitat for narrow-headed gartersnake east of point

Analysis of potential archaeological effects from USAF Angle Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States on the Gila National Forest

Prepared by Wendy Sutton, Forest Archaeologist

Based on the written description of this activity, there will be no ground disturbing activities associated with this project. However, the FS and USAF may have different ideas on what constitutes "ground disturbing activities." Please remember that driving off roads is considered "ground disturbing" by the FS. Additionally, any encampments could be ground disturbing.

Commented [FN18]: Comment addressed in Section 2.1.1.2, paragraph 1, last sentence.

I reviewed the UTM coordinates associated with the project for previous archaeological inventory and the presence of any sites, using GIS data. This data can be somewhat out-of-date and contain some errors (particularly in survey intensity). This said, most proposed exercise areas appear to be either within previous inventory and/or will occur at pre-existing facilities where previous ground disturbance renders the effects from a possible helicopter landing and use of said facilities negligible. Eligible sites near these facilities, unless otherwise noted, are typically the historic facilities themselves.

As with normal 106 compliance, a separate compliance record is required for each undertaking. Please confirm the level of potential ground disturbance associated with these locations.

Comments and Notes on Angel Thunder Proposed Sites

Location (their designation)	Activity Type	Archaeological Survey	Sites	Comments
Negrito South	DZ	No Survey	No Known Sites	No ground disturbance!
Negrito North	DZ, HLZ	LTC Survey 1979-25 and 1988-27 (not adequate)	No Known Sites	No ground disturbance!
Glenwood Ranger Station	HLZ	Intensive Survey: 1985-108; 1979-17; 2008-44; 1993-149	Sites in area include administrative building/sites; no adverse effect	Could approve
Negrito Airstrip	HLZ	No Survey currently in system	No known sites	I moved location to main airstrip crossing; however situation is identical. May be able to authorize based on previous disturbance.
Negrito Center (this is actually Negrito Airstrip)	DZ	No Survey	Unknown	May be able to authorize based on previous ground disturbance.
Negrito Helibase (mapped to Negrito Work Center)	HLZ	Intensive Survey: 1996-73; 1998-38; 1885-12; 1977-33 (question intensity of 1977-33)	No known sites	Could approve
Rainy Mesa	HLZ	Intensive Survey: 1980-14 (is intensive)	No known sites	Could approve
Reserve Airport	HLZ; LZ	Multiple adequate	06-1287 & 374 & 880	Mix of sites in area. Some appear to be administrative (others are pit houses). Will need to avoid some areas if ground disturbing activities might occur.
Reserve Ranger Station	HLZ	Intensive Survey: 1980-46; 1980-21; 2005-35; 1988-138	Location plotted on site 06-869 (Prehistoric, not eligible)	Could approve
Cañon Fairgrounds	HLZ	1974-3 (despite being called "intensive" in database, file search reflected low intensity)	No sites recorded during previous inventory	May be able to authorize based on previous ground disturbance.
Reserve (actually near FS compound)	DZ	Survey: 1980-46 (intensity unknown); 1980-21 (intensive survey)	Near site 06-59 (prehistoric) - avoid site	Could approve with site avoidance



Doug Ducey
Governor

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Sue Black
Executive Director



April 11, 2017

Colonel Scott C. Campbell
Vice Commander, 355th Fighter Wing
3405 S Fifth Street
Davis Monthan Air Force Base, AZ 85707



E-MAILED

4-11-17

Attention: Kevin Wakefield, Base Natural and Cultural Resource Manager

RE: Angel Thunder Personnel Recovery/Rescue Training Exercise Project; Arizona, New Mexico, California; DOD-AF, USFS, ASLD, private, municipal; SHPO 2016 – 1271 (135753)

Dear Colonel Campbell:

Thank you for continuing to consult with our office regarding the above referenced project. Pursuant to 36 C.F.R. Part 800, the implementing regulation for Section 106 of the National Historic Preservation Act, we have reviewed the documentation submitted, *Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States: Section 106 of the National Historic Preservation Act – No Historic Properties Affected Determination for Exercise Locations in Arizona*, and have the following comments:

1. It is our understanding that the United States Air Force (USAF) is proposing to expand their Air Combat Command's Angel Thunder Personnel Recovery/Rescue Training Exercise centered on Davis-Monthan AFB. We further understand that the exercises associated with this proposed training incorporate multiple states and multiple jurisdictions, including private, state, and federal lands in Arizona, New Mexico, Nevada, and California. The proposed project will increase the number of personnel, frequency of training, and locations of training. Essentially, this project will become biannual, combining training for pararescue combat aircrews with additional intelligence personnel, battle managers, and joint search and rescue center personnel in multiple areas around Arizona and other adjacent states. Activities would include landing zones (LZs), helicopter landing zones (HLZs), drop zones (DZs), forward aircraft refueling points (FARPs), and miscellaneous activities comprising mostly classroom training, establishment of shooting ranges, etc. USAF is the lead federal agency for this undertaking.

It is our understanding that the undertaking identifies 139 DOD and non-DOD locations that could serve as training locations, but not every one may be used each year. Of the 139 locations, 110 are located in Arizona.

2. The project's area of potential effect (APE) includes a 330 – foot radius around proposed training locations. Ground transportation of personnel to and from locations

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would use existing access roads, both paved and unpaved. The proposed project will not include road improvement activities, off-road use, or new road construction. The USAF indicated that access roads are not included in the project's APE, *because* the level of use is not anticipated to impact historic properties (Letter from Colonel Scott C. Campbell to Kris Powell, dated 3-6-17). However, the entire area associated with the undertaking needs to be included in the study, regardless of anticipated impact level so that indirect and cumulative effects are considered. Please redefine the APE to include non-paved access roads in your Class I inventory. 

3. The USAF has determined that this project would have a finding of "No Historic Properties Affected." We cannot concur with your finding at this time because additional information is needed to fully evaluate the undertaking's effect on historic properties. Specifically, we have concerns regarding the adequacy of the inventory effort for this undertaking. Our concerns are outlined in items #4 and #5, below:
4. Table 1, *Record Search Results for Proposed Training Locations on USFS and Miscellaneous Properties in Arizona*, provides information as to whether each proposed location had been previously surveyed for cultural resources and if known cultural resources are present within the area of potential effect. We are concerned that this Table may not be complete, as per the following:

For the 110 locations in Arizona, 35 are included on military installations. Although the Table denotes references to some survey reports, no cultural resources are identified for those locations, only the phrase, "currently used for training." The location of AUX 6 on the BMGR East contains AZ Z:1:29(ASM)/Mobak Site and the Gila Bend Air Force Auxiliary Base contains several sites that recently witnessed some data recovery. 

The Environmental Assessment for the project (pg 3-73) indicates that the proposed action would "result in a negligible increase in existing operations at these training sites; therefore, cultural resources on military installations in southern Arizona are not discussed." As mentioned previously in this letter, all parts of the project within the APE must be addressed, regardless of the anticipated project impacts. Please review the DOD Report cited above and revise Table 1 to include all sites previously recorded in the project APE. 

Some of the previous surveys in the Table appear to be more than 10 years old, and there is no evaluation as to whether they are still valid surveys (See SHPO Guidance Point No. 5, 2004, *SHPO Position on Relying on Old Archaeological Survey Data*, which can be found on our website at <https://azstateparks.com/shpo-guidance-2016-updates>). Please evaluate these surveys according to these SHPO guidelines. 

The Table also includes locations on USFS lands, private, state, and municipalities. Most of the USFS lands have not been previously surveyed for cultural resources, nor

-
- Number: 1 Author: ELECLERC Subject: Sticky Note Date: 4/13/2017 9:34:22 PM
The USAF wishes to discuss this further with the SHPO. The proposed level of vehicle traffic on non-paved roads would be minimal. Most non-paved roads are either on military installations or on USFS property where they are already approved for use by the military or by the public.
-
- Number: 2 Author: ELECLERC Subject: Sticky Note Date: 4/14/2017 8:14:51 AM
Installation CRMS typically only provided information as to whether cultural resource concerns were present (i.e. historic properties that would be adversely affected) or if the CRM could approve use of the specified training sites. The BMGR CRM did not notify us of the presence of this site during previous communications; rather, Ms. Rankin informed us there were no cultural resource concerns for the training sites on BMGR East.
-
- Number: 3 Author: ELECLERC Subject: Sticky Note Date: 4/13/2017 9:37:30 PM
The USAF would like to discuss DoD sites further with the SHPO. These are approved training locations. They must undergo internal review before they are used, according to each installation's procedures. That includes a cultural resources review.
-
- Number: 4 Author: ELECLERC Subject: Sticky Note Date: 4/14/2017 8:17:47 AM
USAF recognizes that old surveys may not meet today's standards and may have missed sites. Most of the previous surveys at proposed training sites are more than 10 years old and may require additional survey to be certain whether sites are present or not. The USAF suggests proceeding with a no effect determination for sites that do not require additional survey and do not have cultural resource concerns. For the remaining sites, the USAF would conduct cultural resource surveys and further consultation on potential effects prior to their approval for use in the Angel Thunder exercise.

have most of the other jurisdictions. There is no discussion on whether any cultural resource studies are planned for those locations that have not been previously surveyed for cultural resources. Please describe your efforts to complete the inventory (identification and evaluation) phase of the project. 1

Please correct the Table by removing “none” from the “Identified Cultural Resources Column” for properties that were not previously surveyed and replacing it with “unknown.” A “none” label can misleadingly indicate that area is devoid of cultural resources. 2

5. Historic properties have been identified within the undertaking’s APE, but there is no discussion regarding measures to avoid, minimize or mitigate the potential impacts to these properties. (As always, we encourage agencies to avoid sites whenever possible, and, since these training activities have some flexibility, we recommend that the USAF avoid known historic properties.) Instead of the above discussion, the USAF provides an assessment of the likelihood of different types of activities to have negligible impacts to the existing properties. This discussion does not include an assessment on effect to properties not yet known. The two types of activities that need more explanation on potential impacts include the HLZs and the DZs. USAF argues that the HLZs are located only within existing helicopter landing areas and any wind or dust would be minimal and would not be expected to adversely affect historic Register-eligible historic properties. However, archaeological resources are often determined eligible under Criterion D. The two aspects of integrity that are crucial to Criterion D properties are materials and location. Given that rotor wash from helicopters can produce extreme winds in upwards of 20 to 40 miles per hour within 50 feet of the helicopter (Lesse et al. 1974, Table 1, pg 13), we are concerned that the severe winds from rotor wash could adversely affect the location of materials on Criterion D-eligible sites. Please provide a more detailed analysis on the potential impacts to Criterion D-eligible sites within 50 feet of HLZs. 3

Additionally, the USAF indicates that DZs would have no impacts to historic properties because the dropped materials would be landing in water. However, significant archaeological properties are often found in close proximity to water. It is assumed that the supplies that are dropped into the water will be retrieved and relocated to solid ground. As such, background research should include the areas surrounding DZs (with natural water sources) to assess the presence of known archaeological sites. If Register-eligible historic properties exist in these areas, we would request that these areas be flagged and avoided during retrieval of dropped supplies.

There are several areas where no surveys have been conducted and little discussion on how to address any unanticipated discoveries. Please include a discovery plan that outlines the processes that will be followed for a discovery, including documentation

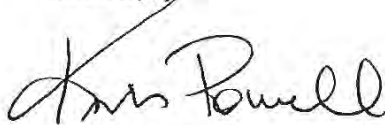
Number: 1	Author: ELECLERC	Subject: Sticky Note	Date: 4/14/2017 8:23:12 AM
The USAF has determined that additional consultation will be required for certain training sites before they are used. Those training sites would include off installation training sites that have not had complete, recent survey and are not otherwise disturbed to preclude the possibility for sensitive cultural resources. The table in Appendix H has been split into two tables these two categories: sites that can be approved for use now, and sites that will require survey and additional consultation.			
Number: 2	Author: ELECLERC	Subject: Sticky Note	Date: 4/14/2017 7:53:03 AM
Table revised per recommendation. Text was also added for training sites on installations that states that "a cultural resources review determined that no historic properties are present that could be adversely affected by the undertaking."			
Number: 3	Author: ELECLERC	Subject: Sticky Note	Date: 4/14/2017 8:23:35 AM
As described above, USAF proposes a "no historic properties affected" determination for all training sites on military installations and off-installation sites that have either been completely surveyed in the last 10 years or where previous disturbance or development indicate no effects are likely (i.e. training at existing airports or a heavily disturbed quarry). USAF has separated Table H-1 into two tables. One lists sites where activities could proceed without additional survey, and the other lists training sites where additional work is needed.			

of the find, evaluation of the eligibility, consultation with consulting parties, and determination of effects, if the discovery is eligible for the NRHP 

As indicated earlier, the State Historic Preservation Office is not able to concur with the USAF's determination of effect at this time. We look forward to reviewing a revised analysis document of the Angel Thunder Personnel Recovery/Rescue Training Exercise which contains a full assessment of the APE, and comprehensive efforts to identify historic properties within the APE. This information will assist us in providing review of USAF's compliance under Section 106 of the National Historic Preservation Act.

As always, we appreciate your continued cooperation with this office in complying with the historic preservation requirements for federal undertakings. If you have any questions or concerns, then please do not hesitate to contact me via e-mail, kpowell@azstateparks.gov, or by phone, 602-542-7141.

Sincerely,



Kris (Dobschuetz) Powell, MA, RPA
Compliance Specialist/Archaeologist

Cc: Adrienne Rankin, Luke AFB
Marty Tagg, Fort Huachuca
Shelby Manney, DEMA
Matthew Behrend, ASLD
William Reed, USFS

Lesse, Grady W. et. al

1974 Helicopter Downwash Data. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. National Technical Information Services, U.S. Dept of Commerce.

Number: 1 Author: ELECLERC Subject: Sticky Note Date: 4/14/2017 8:31:51 AM

Each installation has SOPs for unanticipated discoveries, often outlined in their ICRMP. A discovery plan will be developed for off-installation training sites as part of the Final EA/FONSI. The plan will generally follow the process outlined at 36 CFR Part 800.13 for post-review discoveries with modifications as needed to address the types of activities and situations that would occur during the Angel Thunder exercise. The plan will include procedures for notification, site protection, documentation, evaluation, consultation, determination of effects.

SHPO - 2016 - 1271 (136532) /gc
ARIZONA STATE HISTORIC PRESERVATION OFFICE



DEPARTMENT OF THE AIR FORCE
355TH CIVIL ENGINEERING SQUADRON (ACC)
DAVIS-MONTHAN AIR FORCE BASE ARIZONA



E-MAILED

4-26-17

20 April 2017

Mr. Christopher L. Brewster, PE
Flight Chief, Installation Management
355 CES/CEI
3775 S. Fifth Street
Davis Monthan AFB, AZ 85707-4927

Kris (Dobschuetz) Powell, MA, RPA
Compliance Specialist / Archaeology
State Historic Preservation Office
1100 W. Washington Street
Phoenix, AZ 85007



Dear Ms. Powell,

REFERENCE: Section 106 Consultation & Request for Concurrence of a Finding of No Adverse Effects on Historical Properties for those activities in the May 2017 Angel Thunder Personnel Recovery/Rescue Training Exercise.

Per our discussion in your conference room on Friday, 14 April 2017, the Air Force requests concurrence from your office on our Finding of No Adverse Effects on Historical Properties for the air and ground training operations that are scheduled to occur during the month of May 2017.

The air and ground training exercises, as we discussed, will consist of aircraft operating in approved flight paths and will utilize existing helicopter landing zones (HLZs) and airports. Ground activities will be restricted to established roads/paths/trails (paved/unpaved). Ingress and egress on the ground will be accomplished using passenger vehicles (some with 4-wheel drive capability), public transportation (train), or on foot. Vehicles will not be allowed off of existing roads/paths during the exercise (ie. no breaking of brush). Additionally, exercise participants will be briefed daily on all mission, safety, environmental, and cultural threats that they may encounter for each specific training task.

As discussed during our meeting, for those unpaved roads/paths that will be used during the May exercise, as with all other existing sites/locations, the Discovery Plan, as outlined in Davis-Monthan's Integrated Natural Resources Management Plan (INRMP), will be initiated upon discovery of any historical object/artifact.

Upon further review, the Air Force has determined that the *Environmental Assessment (EA) Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States* will result in a Mitigated Finding of No Significant Impact (FONSI), and that additional consultation with the Arizona State Historic Preservation Office will be required for certain training sites before they are permitted for use. Those training sites would include off-installation training sites that have not had complete, recent surveys and are not otherwise disturbed in order to preclude the possibility for sensitive cultural resources. The table in Appendix H of the EA has been divided into two tables that designate sites that can be approved for use now, and sites that will require survey and additional consultation.

Agile Combat Power

Again, this request for Section 106 concurrence of a Finding of No Adverse Effects on Historical Properties is specifically for the activities discussed for the May 2017 exercise only. We look forward to working with your office to complete the Section 106 process for the remaining Angel Thunder Exercise locations needing additional review.

Please do not hesitate to contact my office at (520) 228-7201, or Mr. Kevin Wakefield at (520) 228-4035, for any additional copies of the INRMP, maps, or tables.

We appreciate your prompt response.

Sincerely,



CHRISTOPHER L. BREWSTER, PE
Flight Chief, Installation Management

NO ADVERSE EFFECT
CONCUR

Kris Powell 4-26-17
Arizona State Historic Preservation Office

*I Look forward to continuing
to work with you on this
project.*

Arizona Notice of Availability Tear Sheets

Arizona Daily Star – Published March 3, 2017

But to get the measure out of the Senate, Sen. Sonny Borrelli, R-Lake Havasu, had to agree to a

See SIGNS, A8

an for the U.S. Attorney's office in Springfield, said "federal law enforcement activity" was being conducted at three Caterpillar locations, including the corporate

Paul said the agencies involved included the Internal Revenue Service's criminal investigation unit, the U.S. Department of Commerce Office of Export En-

focusing on its business practices, according to filings with the Securities and Exchange Commission.

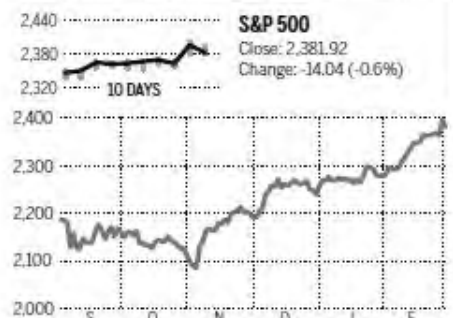
Most recently, in early 2015, a

In 2013 and 2014, Caterpillar subsidiary Progress Rail was the target of two investigations into environmental and other violations.

MARKET ROUNDUP

U.S. stocks closed lower Thursday, erasing some of the gains from a day earlier, when the major indexes soared to their latest record highs. Banks and other financial companies fell the most. Materials and industrials companies also declined. Energy stocks fell along with the price of crude oil. Utilities and phone company stocks bucked the broader market slide. Investors jumped at the chance to snap up shares in Snap, the parent company of the Snapchat messaging app.

	HIGH	LOW	CHANGE	CLOSE
▼ DOW 30	21,129.20	20,996.61	-112.58	21,002.97
▼ NASDAQ	5,897.01	5,856.30	-42.81	5,861.22
▼ S&P 500	2,394.75	2,380.17	-14.04	2,381.92
▼ Russell 2000	1,413.16	1,395.15	-17.97	1,395.66



LOCAL AND WIDELY HELD STOCKS

NAME	TICKER	CLOSE	CHG	%CHG	YTD	YTD	VOL
					%CHG		(Thous)
AT&T Inc	T	42.07	+0.03	+0.1	-1.1	4.7	12660
Accel/Dig	AXDX	25.75	-0.30	-1.2	-24.1	-	30
Airbnb	AIR	45.72	-1.37	-2.9	-2.1	9	7515
Apple Inc	AAPL	138.96	-0.83	-0.6	+20.0	1.6	25426
B/E Aero	BEAV	63.89	-1.2	-1.9	+6.1	1.3	872
Baidu	BAC	25.23	-0.27	-1.1	-34.2	1.2	9782
BerkH B	BRK/B	175.89	-1.39	-0.8	+7.9	-	3956
Caterpillar	CAT	94.36	-4.22	-4.3	+1.3	22968	
CityLink	CTL	23.53	-0.1	-0.4	-1.1	9.2	9396
Chevron	CVX	113.36	-0.52	-0.5	-3.7	3.8	5450
Chigroup	C	60.63	-0.91	-1.5	+2.0	1.1	16978
Coca-Cola	KO	42.47	+0.31	+0.7	+2.4	2.5	15000
Cowys	CWG	21.56	-0.88	-4.1	-12.2	1.7	3012
Cosco	COST	177.98	+1.2	+0.7	+11.2	1.0	2633
DukeEnergy	DUK	82.36	+0.43	+0.5	+6.1	4.2	3902
ExxonMobil	XOM	83.30	+0.28	+0.3	-7.7	3.6	13557
Fortis	FTS	31.92	+1.1	+3.4	+3.4	3.7	216
Freight	FDX	123.31	-0.68	-0.5	-4.9	-	23333
Genzyme	GZ	191.05	-1.36	-0.7	+0.7	1.8	1045
GenieCo	GE	30.19	-0.1	-0.3	-4.5	2.2	25641
GraniteC	GVA	52.77	-1.45	-2.7	-4.1	1.0	350
HTG Mot h	HTGM	2.82	-0.35	-12.0	+25.9	-	1135
HomeDep	HD	147.95	+1.27	+0.9	+10.3	2.4	3838
HomeVint	HON	126.33	-0.92	-0.7	-9.0	2.1	2960
HudBayMg	HBM	8.00	-0.50	-6.3	+40.4	-	826
Intel	INTC	35.91	-0.02	-0.1	-1.0	2.9	23069
IBM	IBM	180.53	-1.42	-0.8	-8.8	1.1	2583
Intuit	INTU	125.17	+0.64	+0.5	-9.2	1.3	3519
JPMorgCh	JPM	92.34	-1.46	-1.6	-6.8	2.1	16516

NAME	TICKER	CLOSE	CHG	%CHG	YTD	YTD	VOL
					%CHG		(Thous)
Johnson	JNJ	123.63	-0.23	-0.2	+7.3	2.6	6775
Kroger's	KR	30.67	-1.39	-4.3	-11.1	1.6	20492
Loews	L	47.25	-0.57	-1.2	+0.9	5	713
Loews	LOW	80.40	-1.05	-1.3	-13.0	1.7	7239
MetLife	MET	53.43	-0.90	-1.7	-0.9	3.0	6406
Microsoft	MSFT	64.01	-0.93	-1.4	+3.0	2.4	23976
NorthropG	NOC	243.07	-1.96	-0.8	+4.5	1.5	1148
PG&E Cp	PEG	66.18	+0.33	+0.5	+8.9	3.0	2629
PepsiCo	PEP	110.11	+0.38	+0.3	+5.2	2.7	3763
Procter & Gamble	PG	41.90	+0.40	+1.0	+0.1	1	55
Raytheon	RTN	154.30	-0.27	-0.2	+8.7	1.9	4147
SearsRoebuck	SHLD	1.77	+0.11	+6.4	-16.4	-	838
SwiGas	SWN	86.10	+0.34	+0.4	+12.4	2.3	169
Target	TGT	77.95	+0.12	+0.2	-19.8	4.1	10629
Talbots	TAN	78.08	-0.01	-0.1	-10	2.6	7356
Timothy	TW	98.96	+0.06	+0.1	+2.5	1.6	2180
UnionPac	UNP	108.05	-1.06	-1.0	+5.2	2.2	2689
UPS B	UPS	105.95	-0.92	-0.9	-7.6	3.1	2430
WalMart	WMT	70.76	+0.31	+0.4	+2.4	2.9	8437
Walgreens	WBA	86.74	-0.03	-0.1	+4.8	1.7	2936
WestMinc	WM	71.28	-0.09	-0.1	+3.3	2.3	1072
Wells Fargo	WFC	58.71	-1.02	-1.7	+6.5	2.6	7215
YumBrands	YUM	65.21	-0.36	-0.5	+3.0	1.8	2155

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FOREIGN EXCHANGE

Country	Foreign currency to U.S.	U.S. to foreign currency
	Today	6mo ago
Britain/Pound	1.2258	1.2594
Canada/Dollar	7657	7657
Euro/Euro	1.0502	1.0502
Mexico/Peso	050009	053850
		19.9964
		18.5700

COMMODITIES

	Close	Previous	%Change	%YTD
Crude oil (bbl)	52.61	53.83	-2.27	-2.1
Copper (lb)	2.68	2.73	-1.72	+2.3
Gold (oz)	1221.90	1248.90	-1.36	+7.1
Silver (oz)	17.70	18.44	-4.00	-11.1

(Previous and change figures reflect current contract.)

PUBLIC NOTICE Notice of Availability

Draft Environmental Assessment (EA) Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States

The U.S. Air Force (USAF), in conjunction with Air Combat Command, and the 99th Air Base Wing, Nellis AFB has completed a Draft EA that evaluates the potential effects of the proposed biannual Angel Thunder (AT) Personnel Recovery/Rescue (PR) Exercise, primarily centered out of Davis-Monthan AFB, Arizona.

The analysis considered in detail the potential environmental effects of the Proposed Action and the No Action Alternative. The results, as found in the EA, show that the Proposed Action would not have a significant adverse impact on the environment, indicating that a Finding of No Significant Impact (FONSI) would be appropriate. An Environmental Impact Statement is not considered necessary to implement the Proposed Action.

Copies of the Draft EA showing the analysis are available for review at the following locations: *Barton Barr Public Library, 1221 North Central Avenue, Phoenix, AZ 85004; Flagstaff City-Coconino County Main Public Library, 300 West Aspen Avenue, Flagstaff, AZ 86004; Himmel Park Branch Library, 1035 N Treat Avenue, Tucson, AZ 85716; Pascua Yaqui Tribe Public Library, 5100 W Calle Totakustin, Tucson, AZ 85757-9308; Quince Douglas Library, 1585 E 36th Street, Tucson, AZ 85713; Salazar-Ajo Library, 15 W Plaza Street, #179, Ajo, AZ 85321; Venito Garcia Library and Archives, P.O. Box 837, Sells, AZ 85634-0837; University of Arizona Library, 1510 E University Boulevard, Tucson, AZ 85721-0055; Glenwood Library, P.O. Box 144, 14 Menges Lane, Glenwood, New Mexico 88039; Lordsburg-Hidalgo Library, 208 East Third St., Lordsburg, NM 88045. The document is also available online at <http://www.dn.af.mil/>.*

Written comments regarding this document should be directed by mail to AFCEC/CZN, 2261 Hughes Avenue Suite 155, (Attention: ACC NEPA PM, Ms. Robin Divine), JBSA Lackland, TX 78236-9853. All comments on the Draft EA must be postmarked by April 4, 2017.

AVISO PUBLICO

Aviso de Disponibilidad

Borrador de Evaluación Ambiental (EA) del Ejercicio de Entrenamiento "Angel Thunder" para Recuperación/Rescate de Personal en el Sudoeste de los Estados Unidos

La Fuerza Aérea de los Estados Unidos (USAF), en conjunto con Air Combat Command (ACC) y la 99th Air Base Wing, Nellis AFB han completado el Borrador EA que evalúa los potenciales efectos del ejercicio biannual "Angel Thunder" (AT) para la Recuperación/Rescate de Personal (PR), basado principalmente en la Davis-Monthan, Base de la Fuerza Aérea (AFB), Arizona.

El análisis consideró en detalle los potenciales efectos ambientales de la Acción Propuesta y la Alternativa de No Acción. Los resultados, encontrados en la EA, demuestran que la Acción Propuesta no tendrá impacto adverso significativo en el ambiente, indicando que sería apropiado un Hallazgo de Impacto No Significativo (FONSI). Una Declaración de Impacto Ambiental no es considerada necesaria para implementar la Acción Propuesta.

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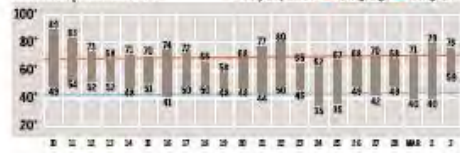
SKYWATCH

Hours of daylight today	11h 37m
Sunset today	6:24 p.m.
Sunrise Sunday	6:46 a.m.
Moonrise Sunday	11:59 a.m.
Moonset Sunday	1:04 a.m.



Normal low 44° 100° days 0 Yuma 56/79/0.00

Tucson temperature trends



WORLD FORECAST

City	Today	Lo/Hi/W	City	Today	Lo/Hi/W	City	Today	Lo/Hi/W
Amsterdam	45/54/f		Buenos Aires	61/73/f		Johnsburg	57/72/f	
Ankara	44/66/f		Cabo	64/73/p		Khartoum	24/51/s	
Baghdad	50/61/p		Cairo	55/72/f		Kuala Lumpur	82/89/f	
Bangkok	75/84/p		Copenhagen	36/45/vh		London	55/75/f	
Beijing	34/53/p		Dublin	47/49/vh		Madrid	44/52/p	
Berlin	41/60/p		Frankfurt	33/51/p		Moscow	32/39/c	
Bombay	26/33/c		Hanoi	26/33/c		New Delhi	54/80/p	
Buenos Aires	61/73/f		Hong Kong	65/73/p		Ottawa	4/15/f	
Burkina Faso	44/66/f		Jerusalem	44/66/p		Paris	45/50/f	

W: weather; P: precipitation; s: sunny; pe: partly cloudy; ec: cloudy; sh: showers; f: fair; r: rain; t: thunder; a: arctic; s: snow; fl: flurries; sn: snow

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Judge mulls accidental killing in Casey Anthony case

ORLANDO, Fla. (AP) — The judge who presided over the acquittal of Casey Anthony in a murder trial televised live around the world said Thursday that an accidental killing is the most logical explanation for her 2-year-old daughter's death.

Former Judge Belvin Perry Jr. told The Associated Press that the theory that makes the most sense to him now, based on the evidence presented at trial in 2011, is that Anthony accidentally used too much chloroform while trying to quiet Caylee, and the infant died. "You have a child that can be-

come cranky, that you want to go to sleep. That is a simple way to do it," said Perry, who is now in private practice. "What we tend to forget is, chloroform was used to render people unconscious long before we had anesthesia."

Asked to respond on Thursday, one of her attorneys, Cheney Mason, said: "I've got your response: She was acquitted."

Anthony, now 30, was acquitted of first-degree murder and convicted of misdemeanor counts of lying to law enforcement after defense attorney Jose Baez told jurors that the toddler accidentally

drowned in the family pool.

Prosecutors said Anthony used chloroform and then suffocated the child by putting duct tape over her mouth.

The toddler's remains were found five months after she disappeared, in a wooded area not far from where the Anthonys lived. Authorities were never able to establish the cause of death.

"I'm disturbed that Mr. Perry would once again go to the press with his thoughts about the case. There is no reason for him to do that," Mason said. "I don't know what motivated Mr. Perry to do

this or why. All I can say is: Everybody is entitled to an opinion."

Florida's Code of Judicial Conduct prohibits judges from making public comments about any pending cases, but it says nothing about former judges talking about cases that are over. A 2011 opinion by Florida's Judicial Ethics Advisory Committee says nothing in the code restricts a judge from talking about a high-profile case once it is finished.

Perry said the case came up this week only because he was asked about it by a reporter from a community newspaper who was

interviewing him for an unrelated story. Other local media then made inquiries about his theory.

Perry said the chloroform theory is one of several regarding Caylee's death he has been examining since he began reviewing trial transcripts at the time of last summer's fifth anniversary of the trial.

"You can't say what happened because you weren't there, but you can talk about the probabilities," Perry said. "Then you can assign whatever weight you want to a theory, and you ask yourself, 'What is more logical?'"

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Thousands flee Iraq's Mosul overnight

MOSUL, Iraq (AP) — Thousands of civilians fled Mosul overnight as Iraqi forces advanced north of a sprawling military base near the city's airport on Friday.

Iraq's special forces pushed into the Wadi Hajar district in western Mosul and retook the area from the Islamic State group Friday, according to Brig. Gen. Yahya Rasool, spokesman of the Joint Military Operations.

Special forces Brig. Gen. Haider al-Obeidi said clearing operations were ongoing in the area and his forces were close to linking up with the militarized fed-

eral police forces who were pushing up along the western bank of the Tigris river.

Iraqi forces, including special operations forces and federal police units, launched an attack on the western part of Mosul nearly two weeks ago to dislodge IS. Since the offensive began, more than 28,000 people have been displaced by the fighting, according to the United Nations.

Nahla Ahmed, 50 fled Mosul late Thursday night, walking more than five kilometers (three miles) from her home in the Shuhada neighborhood.

"All the families were hiding behind a wall," she

said, explaining how they escaped an IS-held part of the city. "We gave the children valium so they wouldn't cry and (the IS fighters) wouldn't catch us."

Ahmed, like most of the civilians who have escaped Mosul in the past week, fled through Mamun neighborhood. The district is partially controlled by Iraq's special forces.

Maj. Saif Ali, who is stationed in Mamun, said huge crowds of civilians began pouring into the area from neighboring districts just after midnight. Ali said civilians in western Mosul are becoming increasingly desperate as food and water

supplies begin to run out.

"In total 7,000 people fled through this area last night," he said. "We were up all night trying to control the crowds."

U.N. spokesman Stephane Dujarric said Friday "the latest figures we have of people recorded leaving western Mosul is 28,400 and that's since operations in west Mosul started on Feb. 19. However we're also tracking down reports thousands more people are on the move."

He said that on average about 4,000 people a day have been fleeing since the beginning of the operation.



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Desert Lightning News

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MARCH 3, 2017

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New Mexico Notice of Availability Tear Sheets

Albuquerque Journal – Published March 3, 2017

Sen. Martin Heinrich, a Democrat who sits on the Senate Intelligence Committee, and Rep. Steve Pearce, the New Mexico delegation's lone Republican, stopped short of calling for Ses-

munications with Russian officials," Luján said. "His role as our nation's top law enforcement official has been compromised and he should do the right thing and resign."

as "honest and correct as I understood it at the time," though he also said he would "write the Judiciary Committee soon — today or tomorrow — to explain this testimony for the record." His explanation, he said, was that he was "taken aback" by Franken's question, which referred to

said.

Earlier Thursday, Trump said that he had "total" confidence in Sessions. Speaking aboard the aircraft carrier USS Gerald Ford in Newport News, Va., Trump told reporters he was not aware of Sessions' contact with the Russian ambassador.

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8 CONVENIENT LOCATIONS**

Just one House Republican, Rep. Sarah Maestas Barnes of Albuquerque, voted in favor of the legislation. And just one Democrat, Rep. Candie Sweetser

local minimum wages higher than \$9.25 an hour, it would prohibit cities and counties from adopting laws that regulate how private employers can schedule

committal earlier this week about the Senate-approved legislation. "The governor supports raising the minimum wage as long as it's in line with neighboring states

patients in New Mexico to end their lives with help from doctors cleared its first test in the Senate. The Democratic-controlled Senate Public Affairs Committee

law makes it a felony for doctors to end the life of a terminally ill patient.

The Associated Press contributed to this report.

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CAROLYN FRANKS

Carolyn Franks, born August 1, 1917, died February 23, 2017, at her home in Silver City, New Mexico, after a long illness. She was born in Silver City on September 16, 1912, to parents Harold H. Franks and Kathryn Marie Franks. She married Peter Thompson of Santa Ana, Arizona, at 19, and they had three children: Peter, Robert, and Susan. She moved to Silver City on April 1, 1944.

Carolyn graduated from the University of Arizona with a Bachelor's degree in Art. She had a great appreciation for art and design, which she demonstrated through her home and garden. She worked in the Deming's book store as a teacher and later a school librarian.

Her gift to posterity was her books. She gave up dancing only to work with her father and a good friend who had been her teacher. She made a comprehensive list of books in the AZHIA World Championship at age 70. She continued to show and sell her books and to compile a list of AZHIA Champions for posterity. Her husband, Peter, died of cancer in 1984. She is survived by her son, Peter, and his wife, Susan, and their children: Robert, Susan, and Peter. She is also survived by her daughter, Susan, and her children: Robert, Susan, and Peter. She is also survived by her daughter, Susan, and her children: Robert, Susan, and Peter.

Funeral services will be held on Tuesday, March 7, at 10:00 a.m. in the Terrazas Funeral Chapel, 100 West Aspen Avenue, Flagstaff, Arizona. Burial will be in the Terrazas Cemetery. Arrangements are under the direction of Terrazas Funeral Chapel, 100 West Aspen Avenue, Flagstaff, Arizona. For more information, call (505) 541-5414.



Terrazas FUNERAL CHAPEL



MARY JEAN ALLEN

Mary Jean Allen, 92, of Silver City, NM, passed away Monday, February 27, 2017, at her home. Mary was born on July 8, 1921, in Santa Clara, NM, to Dr. O. H. Allen and Celia Mae Holladay. She grew up in White Sulphur, NM, and attended school at the White Sulphur School House. In 1939, she met the love of her life, Roy, and they married in 1952. Roy and Mary were not to have two sons and make their home in Terrell, NM. Mary lived a happy and healthy life. She had a great appreciation for life and loved to spend time with her family and friends. She was a member of the Silver City Senior Center and the Silver City Chapter of the United Methodist Church.

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High Desert Sportsmen's Club

HIGH DESERT GUN SHOW

2017 INVITATIONAL

WHEN
Saturday March 11, 2017 9AM - 5PM
Sunday March 12, 2017 9AM - 1PM

WHERE
Grant County Veteran's Memorial Conference Center
1031 Highway 180 East, Silver City, New Mexico
(Next to Ace Hardware)

ADMISSION
Adults: \$4.00
Under 12: Free with adult admission
Military/Law Enforcement in uniform: FREE

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150 Tables

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Food Service Available by Wranglers 4-H Club
For further information and vendor registration contact:
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Silver City, NM 88061
get.terry.louck@outlook.com

IN MEMORY OF
LUPITA AGUILAR
1-11-82 - 3-5-05
12TH ANNIVERSARY

Dear Lupita,

If you were here, I would tell you I am enjoying life for us, living for the moment and loving life as you did. If you were here, I would tell you that I embraced the pain, moved through it, and now sedate myself with beautiful memories of you. If you were here, I would tell you that I can now count the gifts of friendship, love and support that I have received as a result of your death. If you were here, I would tell you how you continue to be missed when a special, loving touch is needed. If you were here, I would tell you that I have learned that sharing our story and helping others has healed my broken heart. If you were here, I would tell you that I now listen with my heart and feel you near to me and that we shall be together again.

Lupita, I believe that God would be satisfied with the quilt I have made from the pieces of our lives and love.

Love Mom, Brothers and Sisters



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ACLU demanda a la policía de San Diego por obtener ADN de menores de edad

Dana Littlefield

Un adolescente afroamericano que fue detenido por la policía el año pasado mientras caminaba por un parque de San Diego, está impugnando la política del Departamento de Policía y su obtención de ADN a menores sin notificar primero a uno de los padres.

Abogados de la Unión Americana de Libertades Civiles (ACLU) de los condados de San Diego y de Imperial presentaron una demanda federal en nombre del joven y su madre, Jamie Wilson. Afirman

que los agentes de policía violaron los derechos civiles del muchacho en marzo de 2016 cuando lo detuvieron, lo esposaron y registraron en el Memorial Community Park en Logan Heights, y luego tomaron una muestra de su ADN sin una orden judicial o el consentimiento de su madre.

Según la queja, la política del Departamento de Policía de San Diego permite a los oficiales obtener el consentimiento de un menor para la recolección de ADN de la misma manera que lo harían con un adulto.

La ley de California restringe la recolección de ADN de un menor para su inclusión en la base de datos de ADN del estado, pero la demanda dice que San Diego ha "soslayado" eso manteniendo su propia base de datos local. Los oficiales están obligados a notificar a los padres del menor solo después de que se ha tomado una muestra de ADN.

La política de San Diego "está dirigida sistemáticamente para eludir el derecho de los padres de aconsejar a sus hijos", dijo Jonathan Markovitz, uno de los abogados que repre-



JOHN GIBBINS U-T

Una oficial de policía de San Diego toma una muestra de ADN de un sospechoso no relacionado con la demanda.

sentan a Wilson y su hijo.

Un portavoz del Departamento de Policía declinó hacer comentarios sobre la demanda, pero proporcionó una copia de los procedimientos de la corporación para tratar con menores. El documento establece que el ADN de un menor se puede tomar y almacenar en el propio banco de datos del departamento si se obtiene legalmente y con fines de investigación.

"Acabamos de ser informados de la demanda presentada por la ACLU. Este caso está pendiente de litigio, por lo que no podemos comentar más", dijo el teniente de la policía Scott Wahl en un correo electrónico.

Los demandantes están buscando una orden judicial permanente de la corte que prohíba que el Departamento de Policía de San Diego imponga la política municipal sobre la

recolección de ADN de menores sin una orden judicial o el consentimiento de los padres. También están pidiendo una orden que obligue al Departamento de Policía a devolver cualquier muestra de ADN del adolescente identificado en la demanda.

De igual forma pretenden daños monetarios no especificados.

Littlefield escribe para el U-T.

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Written comments regarding this document should be directed by mail to AFCEC/CZN, 2261 Hughes Avenue Suite 155, (Attention: ACC NEPA PM, Ms. Robin Divine), JBNSA Lackland, TX 78236-9853. All comments on the Draft EA must be postmarked by April 4, 2017.

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PERALTA • Credited for smothering grenade

FROM B1

The events surrounding a commissioning ceremony are usually planned by a civilian volunteer committee, often helped by a Navy League chapter.

The commissioning itself, a formal ceremony during which a ship is placed into active service, is conducted by the Navy.

Harkins said the commissioning committee is planning for a July 29 event — knowing that circumstances may change as the ship makes its way from a Maine shipyard.

Cmdr. John Perkins,

spokesman for the Naval Surface Force command in San Diego, said the Navy plans for a commissioning no later than July but hasn't released a firm date.

Peralta was stationed in Hawaii when his unit was deployed to Iraq. Peralta and his squad were doing house-to-house searches in Palmyra on Nov. 15, 2004, when he was killed.

Marines with Peralta credited him with smothering a grenade with his body to save others at the scene. The Marine Corps nominated Peralta for a Medal of Honor, the nation's highest combat decoration.

In a still-controversial move, the Pentagon downgraded the award one level to a Navy Cross after questions about whether Peralta, already wounded in the head, was conscious when he smothered the grenade.

Peralta's mother, Rosa, is the ship's sponsor. The family recently accepted the Navy Cross after a long campaign in Congress to upgrade the medal — a campaign that may have fresh legs under the new defense secretary, Jim Mattis, who commanded troops in Iraq and retired as a four-star Marine general.

The ship's motto is "for the ad finem," which translates to "courageous to the end."

peralta@sanuniontribune.com
Facebook: LT Peralta
Twitter: @jperalta

WATCHDOG Some unsure on decision

FROM B1

boosting efficiency, and the district's desire to focus audits on more high-dollar spending. The district will hire outside auditors to do the work, with oversight from district's independent audit and finance committee.

"The point was to make it more independent but also more focused on high-level risks," Sharp said. "We take the auditing thing very seriously."

Andrea Niehaus, who served as the district's audit director for decades, questioned the wisdom of switching to outside auditors. She said she thinks the cuts are about keeping bad news about the district from

getting out — not saving money. She said an internal audit department could handle issues by finding waste, fraud and abuse.

"A district this size really has to have an audit department," Niehaus said. "I don't know how you can operate without it. The external auditors don't look in that much depth."

"To eliminate your only oversight that independently looks at you, I can't get over why they would do that," Niehaus continued. "It seems almost political to me. But they don't want anyone looking at what they're doing, more than a financial decision."

District officials said the new auditors will not be the same types who produce the district's annual financial reports. The district will choose a firm that has the expertise and resources to take a close look at internal controls in high-dollar pro-

grams such as procurement, which have different expertise than the internal audit staff.

In recent years, internal audits have discovered substantial waste of taxpayer money. For example, a September 2014 report checked the Finance Division's spending and accounting for the employee benefits from 2007 to 2013. Findings included \$64,597 erroneously paid for ineligible terminated workers, and employees on leave of absence. The department also wasted \$55,178 by continuing to pay post-employment benefits to employees after the workers canceled their plans.

Audits discovered errors in the district's accounting that led to multimillion-dollar understatements and overstatements in benefit liabilities.

niehaus.ack@sanuniontribune.com

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Written comments regarding this document should be directed by mail to AFCEC/CZM, 2261 Hughes Avenue Suite 155, (Attention: ACC NEPA PM, Ms. Robin Divine), JBSA Lackland, TX 78236-9853. All comments on the Draft EA must be postmarked by April 4, 2017.

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PUBLIC NOTICE
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Written comments regarding this document should be directed by mail to AFCEC/CZN, 2281 Hughes Avenue Suite 155, (Attention: ACC NEPA PM, Ms. Robin Divine), JB5A Lackland, TX 78236-9653. All comments on the Draft EA must be postmarked by April 4, 2017.

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AVISO PUBLICO
Aviso de Disponibilidad
Borrador de Evaluación Ambiental (EA) del Ejercicio
de Entrenamiento "Angel Thunder" para
Recuperación/Rescate de Personal en el Sudoeste
de los Estados Unidos

La Fuerza Aérea de los Estados Unidos (USAF), en conjunto con Air Combat Command (ACC) y la 99th Air Base Wing, Nellis AFB han completado el Borrador EA que evalúa los potenciales efectos del ejercicio bienal "Angel Thunder" (AT) para la Recuperación/Rescate de Personal (PR), basado principalmente en la Davis-Monthan, Base de la Fuerza Aérea (AFB), Arizona.

El análisis consideró en detalle los potenciales efectos ambientales de la Acción Propuesta y la Alternativa de No Acción. Los resultados, encontrados en la EA, demuestran que la Acción Propuesta no tendrá impacto adverso significativo en el ambiente, indicando que sería apropiado un Hallazgo de Impacto No Significativo (FONSI). Una Declaración de Impacto Ambiental no es considerada necesaria para implementar la Acción Propuesta.

Copias del Borrador EA demostrando el análisis está disponible para revisión en los siguientes lugares: Burton Barr Public Library, 1221 North Central Avenue, Phoenix, AZ 85004; Flagstaff City-Coconino County Main Public Library, 300 West Aspen Avenue, Flagstaff, AZ 86004; Himmel Park Branch Library, 1035 N Treat Avenue, Tucson, AZ 85716; Pascua Yaqui Tribe Public Library, 5100 W Calle Tatakusim, Tucson, AZ 85757-8308; Quindie Douglas Library, 1585 E 36th Street, Tucson, AZ 85713; Salazar-Ajo Library, 15 W Plaza Street, #179, Ajo, AZ 85321; Venito Garcia Library and Archives, PO Box 837, Sells, AZ 85634-0837; University of Arizona Library, 1510 E University Boulevard, Tucson, AZ 85721-0055; Glenwood Library, P.O. Box 144, 14 Menges Lane, Glenwood, New Mexico 88039; Lordsburg-Hidalgo Library, 208 East Third St., Lordsburg, NM 88045. El documento está disponible en línea en <http://www.dm.af.mil/>

Los comentarios por escrito sobre este documento deben ser enviados a AFCEC/CZN, 2261 Hughes Avenue Suite 155, (Atención: ACC NEPA PM, Ms. Robin Divine), JBSA Lackland, TX 78236-9853. Todos los comentarios del Borrador EA deben ser enviados antes del 4 de Abril 2017.

Public Comments Received

Substantive comments provided on the Public Draft EA are noted with comments that indicate the section of the document where they have been addressed.

**George E.B. Stewart
2330 E. Camino Miraval
Tucson, AZ 85718**

March 23, 2017

Angel Thunder Public Comments
AFCEC/CZN,
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine,

As a resident of Tucson, Arizona, I want the armed forces that protect me, my family, and my fellow citizens to have the finest training and support in the world. The Angel Thunder exercises conducted out of our own Davis-Monthan AFB provide incomparable training opportunities for the brave men and women serving in Combat Search and Rescue.

I understand that an Environmental Assessment is being conducted for the Angel Thunder program and comments are requested regarding same.

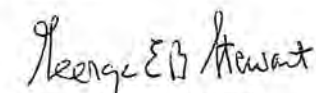
There are so many positive benefits that come from this exercise but only one is really needed to justify its existence – the training it provides for Search and Rescue missions on behalf of both our military and our civilians (our community has directly benefitted from civilians rescued by SAR-trained teams from DMAFB, for example).

While there may be a temporary increase in aircraft activity, it is hardly noticeable in the general scheme of things – and certainly not objectionable given the reason for the activity.

Finally, hosting Angel Thunder in Tucson may give me the opportunity to meet some of the participants as they spend any down-time in our community. When I do, I can proudly shake their hands and thank them for their service.

I strongly advocate for and support the Angel Thunder program at Davis-Monthan AFB.

Sincerely,


George E.B. Stewart

March 24, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

Mark Ziska
6741 N. Avenida De Las Palazas
Tucson, AZ 85750

Dear Ms. Divine,

I live near the flight path to Davis Monthan AFB, and have for 18 years. I have marveled at the planes in flight, be they the heritage bird or the newest Raptors. I always appreciate the A-10s for the work they do in protecting our freedom. The helicopters participating in Angel Thunder are a welcomed addition to those birds regularly flying over. I fully support the Angel Thunder mission. These brave men and women, are truly Guardian Angels. Keep it up.

Respectfully,

A handwritten signature in black ink, appearing to read "Mark D. Ziska", followed by a long horizontal line extending to the right.

Mark Ziska

March 24, 2017

Angel Thunder Public Comments

AFCEC/CZN

Attn: ACC NEPA DM

Ms. Robin Divine

2261 Hughes Ave., Suite 155

JBSA Lackland, TX

78236-9853

Robert D. Bastron, M.D.

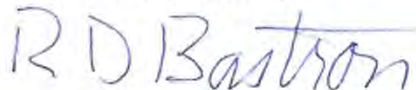
3575 N Pantano Rd

Tucson, AZ 85750

Dear Ms. Divine,

As an anesthesiologist with over forty years experience with trauma cases, I recognize and appreciate the importance of well-trained Combat Search and Rescue personnel. They are critical not only for the military, but are often called on to rescue injured hikers in remote areas of our deserts and mountains. I am strongly in favor of the Angel Thunder exercise.

Respectfully yours,

A handwritten signature in blue ink that reads "RD Bastron". The letters are cursive and fluid.

Robert D. Bastron, M.D.

March 24, 2017

AFCEC/CZN

Attn: ACC NEPA DM

Ms. Robin Divine

2261 Hughes Ave., Suite 155

JBSA Lackland, TX

78236-9853

Dear Ms. Divine,

As a resident of Tucson I have come to appreciate the mountains, the weather, and the diverse and vibrant industry and culture of Tucson. Although I personally never served in the military, I live (and work) very close to Davis-Monthan Air Force Base and I fully support the mission of the base and its role in serving the national security interests of our nation. Each year there are exercises, training events, and real world operations conducted by the various operational elements of Davis-Monthan that support our armed forces around the globe. The Angel Thunder mission is one of these events that I find to be an integral part of our lives. I am proud to be part of the Tucson community and greatly appreciate the dedication and professionalism demonstrated by the Angel Thunder participants, and I do not experience any inconvenience at all from the exercise. It is a comfort knowing that we have brave and dedicated men and women who train so hard to be ready to perform their critical combat search and rescue mission.

Very respectfully,



Austin K. Yamada
571 N. Kolb Road
#33204
Tucson, AZ 85718

DAVID W. EPPIHIMER
3218 N. San Sebastian
Tucson, AZ 85715
davideppihimer@comcast.net
520-885-2098

March 25, 2017

Angel Thunder Public Comments
AFCEC/CZN

Dear Ms. Devine,

As a resident of Tucson, AZ I am writing you today in support of the Angel Thunder exercise and EA. Davis Monthan AFB, with its optimal weather for flying, and proximity to the Barry Goldwater range, is the ideal host site for this important event.

As a 26 year resident of Tucson, I find the modest noise made by the military aircraft flying in the Tucson airspace to be the SOUND OF FREEDOM. It's important to note, too, that the draft EA has come back with a finding of no significant impact.

Thank you for allowing me to weigh in on this important event for Tucson and Pima County. I appreciate your thoughtful consideration in this matter.

Sincerely,



David W. Eppihimer

Anne Gomez
11980 E. Settlers Trail
Tucson, Arizona 85749
goanne@cox.net
(520) 297-1758[Type here]

AFCEC/CZN
2261 Hughes Avenue Suite 155
(Attention: ACC NEPA PM, Ms. Robin Divine)
JBSA-Lackland, TX 78236-9 853
March 23, 2017

Dear Ms. Divine,

In response to the request for comment to the FONSI for the Draft Angel Thunder EA. As you know one of the most important elements of NEPA law as enforced by the CEQ is the cumulative effect on the human element. The Draft EA fails to address the numerous "transient" aircraft and flyovers of aircraft i.e. the recent F-35s from Luke AFB, also as part of the Heritage Flight Conference. 

There is significant residential encroachment at the northwest end of the runway with homes less than a mile from D-M. See attached Google Earth capture of the northwest end of the base (bottom right) with the nearby homes that were in existence at the time the jet runway was built in the early 50's. Many of the homes in the Julia Keen and Alvernon Heights Neighborhoods are occupied by low-income minority families. The "piling on" of more flights only exasperates a situation that already violates Environmental Justice regulation.

The Total Force Training EA is in Federal court awaiting judicial decision. The Angel Thunder expansion only points to the lack of thoroughness and disregard for the cumulative effect on the community.

Please advise of any response or edits to the Angel Thunder EA.

Respectfully,



Anne Gomez

Summary of Comments

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 1:27:58 PM

Comment addressed in Section 5.1.1, Table 5-1. Under "Luke AFB," the beddown of up to 144 F-35A aircraft at Luke AFB is discussed. The total transient aircraft included in Appendix E, Table E-1 is based on the 2008 AICUZ data converted to average daily operations. This is the best available information at this time, and has been carried forward as a comparative baseline to determine the effects under NEPA.

Anne Gomez
11980 E. Settlers Trail
Tucson, Arizona 85749
goanne@cox.net
(520) 297-1758



DMAFB

AFCEC/CZN, Attention: ACC NEPA PM

3/3/17

Ms. Robin Divine

2261 Hughes Avenue Suite 155

JB SA Lackland, Texas 78236-9853

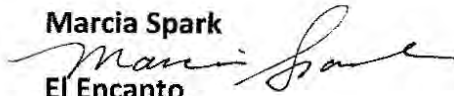
To all it may concern:

As a mid-town resident in Tucson, Az, I strongly oppose Angel Thunder at DMAFB and any other mission creep. The increase in air traffic over residential neighborhoods will greatly impact the lives of hundreds of Tucson citizens in a negative and potentially harmful way. If allowed there will be much greater noise and air pollution at the least which will affect the quality of lives as well as the enjoyment and value of our most prized possessions, our homes.

Sincerely,

Marcia Spark

El Encanto



AFCEC/CZN

March 10, 2017

Atten ACC NEPA DM

Ms. Robin Divine

2261 Hughes Ave Suite 155

JBSA Lackland, Tx

78236-9853

Bryan Foulk

PO Box 90896

Tucson, AZ 85752

Dear Ms. Divine,

I live under the flight path to Davis Monthan AFB, and have for many years. I fully support the Angel Thunder mission. Yes, I see more helicopters during the exercise but they do not impact me or my neighbors in any way. Most days of the posted exercise there seems to be no extra flights over me. If my son was downed in hostile areas I would want the best trained personnel to rescue him. Keep it up.

Respectfully,

Bryan Foulk

A handwritten signature in black ink, appearing to read 'Bryan Foulk', with a stylized flourish at the end.

March 24, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

Dear Ms. Divine,

My father was a veteran of Davis-Monthan and we have lived in Tucson for many years. Davis-Monthan AFB is an integral part of Tucson and is part of the fabric of this community.

I read in the Arizona Daily Star about the Angel Thunder exercise and found out there is an EA that invites public comments. Therefore, please accept this letter as one that fully supports the Angel Thunder mission.

Reading about the Angel Thunder exercise was fascinating -- especailly since it is going to cover multiple states and incorporate over 2,000 military personnel from many branches of the service. I cannot imagine how anyone would not support Angel Thunder. It is such a necessary and needed exercise for these talented young men and women to hone their combat search and rescue skills.

Another key point is how the terrain of this region so closely mimics the terrain of the middle eastern countries, where much of this knowledge will ultimately be deployed.

Sincerely,

A handwritten signature in cursive script that reads "Judy Logan".

Judy Logan

Judy Logan
4630 E. San Carlos Place S
Tucson, AZ 85712



Jack Harris

Training/Leadership Skill Development/Keynote Presentations

March 26, 2017

Angel Thunder Public Comments
AFCEC/CZN,
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine,

As a resident of Tucson for the past 42 years, I am writing to express my full support for Angel Thunder. Seeing military aircraft flying around Davis Monthan AFB is a welcome sight because I know their training makes a difference to our military members serving overseas. As a father of two sons actively servicing in the military (both with multiple combat deployments), this has special meaning to me.

The terrain in our area is similar what our military encounters in the Middle East and the combination of weather, air space and access to the Barry Goldwater range provides the most realistic training environment for a variety of scenarios. Angel Thunder will help save the lives of military members who are in dangerous and high risk situations.

Please don't allow the "loud (not in my back yard)" voices of a small majority to overshadow the clear majority of Tucson residents who support the military presence in Tucson/Southern Arizona and the Angel Thunder Environmental Assessment that finds no significant impact.

Respectfully,

Jack Harris

3903 N. Lindstrom Place • Tucson, Arizona 85750-2089
office 520.296.5488 • fax 520.298.8738 • jack@jackharris.org
www.jackharris.org

March 27, 2017

AFCEC/CZN
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Robin McGeorge
6426 E Santa Elena
Tucson, AZ 85715

Dear Ms. Divine,

I have lived in Tucson, AZ for over 40 years. I have always been and will continue to be a strong supporter of Davis-Monthan AFB in Tucson. I am very much in favor of the Angel Thunder exercise and EA. The DM Rescue Groups are some of the finest in the U.S. Air Force and I believe this training is critical for them to maintain their standing as one of the best.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. McGeorge', with a stylized, flowing script.

Robin McGeorge

Charlotte Harris
2740 E. Avenida de Posada
Tucson, AZ 85718
March 27, 2017

Angel Thunder Public Comments,
AFCEC/CZN
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine:

I am writing to you to inform you of my TOTAL support for the need for Angel Thunder to remain at Davis-Monthan AFB.

As a Tucson citizen since 1961, we as a community are proud of the work of DMAFB and appreciate the dedication of the men and women who serve our country who are based and train here, especially the comprehensive multi-state and multi-agency exercise for Combat Search and Rescue, Angel Thunder.

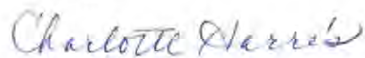
I write to you as I am concerned a minority of vocal members of our community may convince you to remove this valuable and important exercise from DMAFB.

Angel Thunder has minimal impact on noise in the Tucson and Southern Arizona region, but the training of Combat and Search and Rescue reaches worldwide, saving our most valuable resources the young American men and women who serve our country in the military.

The economic impact of the 3 weeks of training that will be done here, has a "trickle-down effect" to our community, but most importantly to the area surrounding DMAFB to enhance service in that area to future airmen and airwomen who will serve at DMAFB.

I stand with many who have a passion for the young men and women who serve our country in protecting freedom throughout the world. Please know of our support of Angel Thunder at Davis-Monthan Air Force Base where training takes place that protects these special Americans as they protect our country's freedom and us! We want them here in Tucson!

Sincerely,



Charlotte Harris

John Bremond
5960 E. San Marino
Tucson, AZ 85715
(520) 721-1794

March 27, 2017

Angel Thunder Public Comments
AFCEC/CZN
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

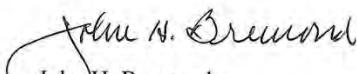
Dear Ms. Divine:

I am writing in support of the Angel Thunder exercises to be held at Davis-Monthan Air Force Base in Tucson, Arizona. I am a native Tucsonan who has a longstanding appreciation for what the Air Force does to provide for our national security and to positively impact our economy. I enjoy seeing and hearing the flight operations that occur in our city, often above my home.

I believe Tucson is the perfect place to hold exercises such as Angel Thunder due to the similarities that exist between our desert environment and those of the Middle East. The residents of southern Arizona are beneficiaries of the training provided through CSAR participation in rescue efforts in our area. And, the Barry Goldwater range is close at hand, allowing easy access for Desert Thunder exercises.

Please record my support for the operation. As the draft EA reported, I perceive no negative impact from the exercise.

Sincerely,


John H. Bremond

James R. Sellers
6601 N. Montezuma Drive
Tucson, Arizona 85718
(520) 326-7378 Phone
Email jim.sellers@cbre.com

March 27, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robbin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Ladies/Gentlemen:

This is to provide our thoughts and support for Davis Monthan AFB as you complete your environmental assessment.

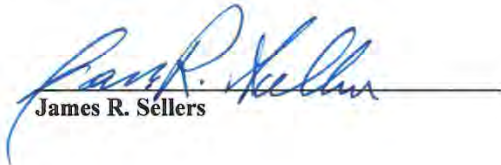
Surveys show the majority of our population living not only near the airbase but Tucsonans in general support flight activities of both Davis Monthan air personnel and the 162nd Fighter Wing of the AZ Air National Guard.

The collaboration necessary for the success of DMAFB and the 162nd Fighter Wing between both the City of Tucson and Pima County has never been higher, thus the decision makers of the local jurisdictions have a proven record of support for the flight activities at DMAFB.

The close proximity of the Goldwater Range, unrestricted flying space and our year round good flying weather makes DMAFB an excellent facility both from a cost efficiency standpoint and also from a use of personnel efficiency standpoint.

DMAFB does not cause significant negative environmental issues, including noise pollution, for the Tucson area populace.

Thank you,


James R. Sellers

March 27, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX 78236-9853

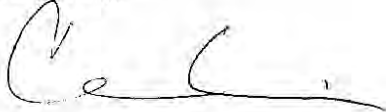
J. Clinton Mabie
4305 E Whittier Place
Tucson, AZ 85711

Dear Ms. Divine,

I live under the flight path to Davis Monthan AFB, and have for many years. I fully support the Angel Thunder Mission at the base and what it does to support our men and women in service, specifically as this mission saves lives.

We are uniquely situated to serve this mission; we have similar terrain that will be encountered in the Middle East and thousands of miles to practice flights. I cannot see a better location in the United States than Tucson for the Thunder Mission. Thank you for your consideration.

Respectfully,

A handwritten signature in black ink, appearing to read 'J. Clinton Mabie', with a stylized flourish at the end.

J. Clinton Mabie

Angel Thunder Public Comments
AFCEC/CZN,
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JB SA Lackland, TX 78236-9853

Date: March 27, 2017
Re: Angel Thunder

To whom it may concern,

As a citizen of Tucson, I want to express my unconditional support for Angel Thunder.

First of all, I am in favor of any training that prepares our service men and women for the dangers and conditions they will face in actual combat.

And, as I'm sure you're aware, Southern Arizona's weather and terrain, not to mention our proximity to the Goldwater Range, provides a perfect environment in which to prepare our service men and women to train in an environment similar to what they will encounter in the 'real' world.

Finally, as a businessperson, I also recognize that the economic impact on our community should not be minimized..

Better than 90 percent of our citizens are strong supporters of DM and its missions, and we realize that any exercise or program stationed at Davis Monthan helps improve our local economy.

So I truly hope you'll consider my comments when assessing the future of Angel Thunder, and should you have any questions, or would like to contact me for any reason, please feel free to do so.

Respectfully,



Richard A. Rose
President / CEO

Nancy McClure
5651 N. Placita Stilbayo
Tucson, Arizona 85718-3906
March 27, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

RE: Letter of Support of Angel Thunder at Davis-Monthan Air Force Base, Tucson, AZ

To AFCEC/CZN:

I am contacting you with my **full support** of ANGEL THUNDER that I understand to be a Joint National Training Capability Accredited/Certified Personnel Recovery exercise for Combat Air Force, Joint, Allied and Interagency participants. Angel Thunder provides the most realistic PR training environment available to more than 2,700 USAF Rescue forces, as well as their Joint, Interagency, and International partners to engage in a variety of personnel recovery scenarios.

DMAFB in Tucson, Arizona is a perfect location for such and we welcome additional use of the base for this and any other needs. The sound of freedom is always thrilling to hear in our community!

DMAFB allows such a special setting including:

- **Weather:** The Tucson weather provides for year-around training capabilities with no natural disasters.
- **Range:** DMAFB close proximity to Goldwater Range- the finest range in the nation makes it economical for DM airplanes to get to the range and spend longer time training.
- **Airspace:** Unrestricted flying space.
- **Topography:** Our mountains and proximity to the ocean allows for diversified training situations.
- **Inter-jurisdictional Cooperation:** Local jurisdictions actively work with DMAFB and with each other and have a proven track record of crossing jurisdictional boundaries during crisis.

Tucson and Southern Arizona is proud to have its military and we look forward to adding to the reasons why the Air Force calls Tucson "home"!

Sincerely,



Nancy A. McClure

520-323-5117

March 27, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

Dear Ms. Divine,

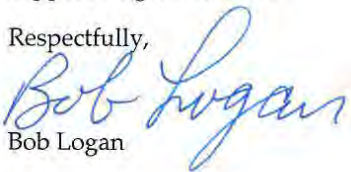
I am a long-time Tucsonan and live midtown near the flight path to Davis Monthan AFB. My father was an Air Force 28 year pilot and served two tours in Vietnam.

Many times, he told me about the experts in combat search and rescue who helped some of his fellow military friends when they were in hostile territory. Therefore, I fully support the Angel Thunder mission.

I also understand that the Angel Thunder exercise will incorporate rescue operations from some of our civilian sectors. I fully embrace our Angel Thunder especially since I know it has helped some of our civilian search and rescue groups learn and use new techniques.

Since most of the operations use helicopters and ground transportation, noise should not be a concern. Thanks for giving the public an opportunity to speak out. I fully support Angel Thunder.

Respectfully,


Bob Logan

Bob Logan
PO Box 210077
Tucson, AZ 85721-0077

March 27, 2017

Ms. Robin Divine
AFCEC/CZN, Attention: ACC NEPA PM
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

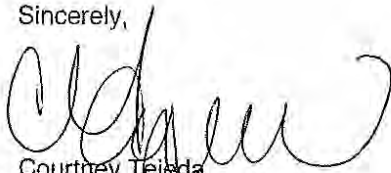
Re: DMAFB - Letter of support for Angel Thunder

To Whom It May Concern:

As a Tucson resident, I support any and all DMAFB missions, especially Angel Thunder. We are the absolute best place to train due to the amount of unrestricted air space and our proximity to Goldwater Range, which is the finest range in the nation and makes it economical for DM airplanes to get to the range and spend longer time training.

I welcome this mission and I am not concerned in any way with any environmental impacts.

Sincerely,

A handwritten signature in black ink, appearing to read 'Courtney Tejeda', written over a light blue rectangular background.

Courtney Tejeda
520-406-5572
11005 N Broadstone Drive
Tucson, Az. 85737



100 S. Church Ave. 520.625.1817
Tucson, AZ 85701 800.638.8350
visitTucson.org f. 520.884.7804

March 27, 2017

AFCEC/CZN
Attention: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine,

I am writing to convey Visit Tucson's strong support for the Angel Thunder mission. As the travel promotion agency for Tucson and Southern Arizona, we value the incredible national defense, economic and jobs-related impacts Davis-Monthan Air Force Base and its activities have on our region.

The economic impact of the Angel Thunder mission, with 2,000-plus military personnel staying in Southern Arizona for three weeks, will likely run into the millions while benefiting many local businesses.

Thank you for bringing the Angel Thunder Environmental Assessment to Tucson. Our sunny weather and Barry Goldwater Range should provide ideal conditions for your combat search and rescue training, while providing an economic boost to our region.

Best Regards,

A handwritten signature in black ink that reads "B. DeRaad".

Brent DeRaad
President & CEO
Visit Tucson



March 28, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

Jim Lubinski
6255 N Wilmot Rd.
Tucson, AZ 85750

Dear Ms. Divine,

My business is under the flight path to Davis Monthan AFB. I fully support the Angel Thunder mission. DM not only serves our country well, but has a direct positive impact on our local community. This mission helps save our troop's lives and it also has helped rescue people throughout Arizona on numerous occasions. Most days of the posted exercise I don't notice any extra activity. And frankly, when I do, I welcome it. It sounds like freedom to me!

Respectfully,



Jim Lubinski

CAFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

March 28, 2017

Dr. Bryan R. Foulk
7830 N Piccola Strada
Tucson, AZ 85742

Dear Ms. Divine,

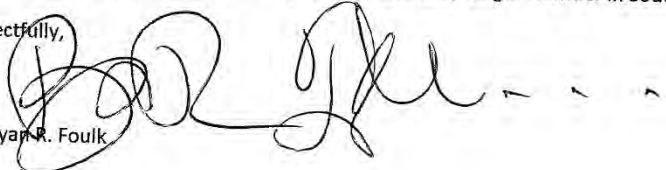
I am a former member of S.A.R.A. (Southern Arizona Rescue Association). I have witnessed firsthand the lives saved from this exercise. The cooperation and training between the military and the civilian personnel in Southern Arizona saves lives. All of us in the search and rescue world benefit from the experiences gained from participating, and even further when that knowledge is communicated back to those of us who did not directly partake in Angel Thunder.

Been there when DPS (Department of Public safety) could not come in to helicopter out someone in desperate need and they needed immediate help. The rescue squadrons from DM received the call and evacuated the injured civilian. Thank you to the brave Airmen who help train our law enforcement and others to perform these tasks. The knowledge learned made me a better member of S.A.R.A.

We have extremely varied terrain and weather here in Southern Arizona. The differences between 10,000 ft. mountain ranges, lakes, and rocky deserts takes skill and experience to know what is best to do. To share in the exercise to, locate, triage, and evacuate an injured person or persons is invaluable. I know I am extremely happy to have Angel Thunder here at Davis Monthan AFB. The Air Force is lucky to have this extremely different topography here in the Tucson area and the unfortunate citizens that fall, get lost or have a medical emergency while outdoors are lucky that the local and state agencies have the AF to help make them better. Thank you again and keep Angel Thunder in Southern Arizona.

Respectfully,

Dr. Bryan R. Foulk



Brian K Harpel
11846 E Wagon Trail Road
Tucson AZ 85749
520-909-8505

March 28, 2017

AFCEC/CZN
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

RE: Angel Thunder - DMAFB

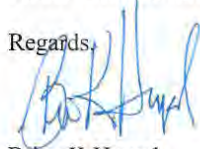
Dear Ms. Divine:

I am writing to express my support for the Angel Thunder Exercise, held annually at Davis-Monthan AFB in Tucson. As a local businessman who is active in the community, I value DM for not only its economic benefit, but to the irreplaceable training it provides our airman to enable them to carry out their missions of sustaining global air power around the world.

DM provides the best weather, range and air space to carry out training, which is unmatched anywhere in the United States. The continuous complaining by a few vocal anti-military types doesn't come close to matching the qualified overwhelming community support DM has in the region. DM is America's asset, and Tucson's treasure!

Please continue this mission at Davis Monthan AFB!

Regards,



Brian K Harpel

March 28, 2017

AFCEC/CZN

Attn: ACC NEPA DM

Ms. Robin Divine

2261 Hughes Ave., Suite 155

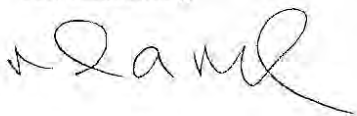
JBSA Lackland, TX

78236-9853

Dear Ms. Divine,

I am a 12 year resident of Tucson, relocating here upon my retirement from the US Navy. I still work for the government, serving as the Facility Manager of USSOCOM's Parachute Training and Testing Facility, located in Marana on Pinal Airpark. I also own two small restaurants in Tucson; Trident and Trident II. I fully support the mission of the base and its role in serving the national security interests of our nation. Having served as a SEAL for vast majority of my Naval career, I fully understand the necessity for exercises and training events that can, and do, ultimately lead to successful real-world operations. The Angel Thunder mission, at least the limited knowledge I have of, represents the culmination of training conducted by numerous United States as well as allied forces. It is a major and necessary mission where SOP's are demonstrated in near-as-possible real world conditions. Where lessons learned may be the difference between life and death sometime in the not so distant future. God bless the men and women who support and defend this country and this proud Tucson community. DM IS a large part of what Tucson is. Anything we can do as civilians should be done without hesitation. I do not experience any inconvenience at all from the exercise. It is a comfort knowing that we have brave and dedicated men and women who train so hard to be ready to perform their critical combat search and rescue mission.

Very respectfully,



Nelson A. Miller
4101 E La Cadena
Tucson, AZ 85718

Danette Bewley
11401 N. Palmetto Dunes Ave.
Oro Valley, AZ 85737

March 28, 2017

AFCEC/CZN
Attn: ACC NEPA DM
Ms. Robin Divine
2261 Hughes Ave., Suite 155
JBSA Lackland, TX
78236-9853

Re: Davis-Monthan AFB / Angel Thunder Mission / Environmental Assessment

Dear Ms. Divine,

I am a citizen of Tucson, Arizona. I fully support Davis-Monthan AFB, the Angel Thunder mission and the Environmental Assessment.

In my opinion, Angel Thunder has minimal impact on noise in the Tucson and Southern Arizona area. The access to the weather, airspace and the Barry Goldwater range is perfect for an Angel Thunder exercise. Furthermore, I support any training that helps saves the lives of our military. The terrain in Arizona, New Mexico, Nevada, etc. is very similar to the terrain our military will encounter in the Middle East. This proactive training across local, regional, civic, jurisdictional, and district lines only helps us prepare for local issues of crisis in our own region. CSAR are often called on in the State of Arizona to rescue citizens when state resources are not available or do not have the capability. Our DM Rescue Groups are some of the finest in the entire United States Air Force. This training is critical to their continued standing as one of the best. Last, the Draft Environmental Assessment has come back with a Finding of No Significant Impact (FONSI).

The majority of Tucsonans (92%) support a military presence in Southern Arizona. The economic impact of over 2,000 military personnel for 3 weeks will run into the millions. This economic impact and multiplier effect will create a great deal of revenue for local businesses in and around Davis-Monthan AFB in Tucson.

Respectfully,



Danette Bewley

Tuesday, March 28th, 2017

Mr. John Navarro
1465 S American Dream Pl
Tucson, AZ 85713

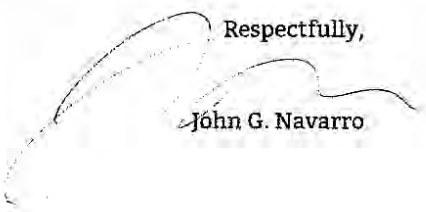
To Whom It May Concern:

My name is John Navarro, a lifelong resident of Tucson, Arizona, home of the Davis-Monthan Air Force Base. This purpose of my letter is to show my support for Angel Thunder, and the base as a whole. The sense of pride, safety, and security that comes along with having a military base here carries sentimental, emotional, and historic value to our growing, yet humble community.

Members from both sides of my family have served in the military, in most branches. My father served our great nation for 29 years, as a paratrooper/ parachute rigger (82nd Airborne, Screaming Eagles). My step-brother did three tours in the Middle East as a Marine. I also have uncles, cousins, and other relatives that have also served. Keeping DMAFB here, and the community-assuring programs they run, truly hits home with our family.

Defending our country is important to many, whether they'd like to admit it, or not. More important, especially to our Military families, is bringing our boys & girls home! I believe our rescue forces are a vital part of that. I'm sure other facts, figures, and statistics will be (or have been) presented in support of this measure, and are certainly selling points for me. Thank you for allowing me to have a voice in the matter, and again, I pledge my support.

Respectfully,



John G. Navarro

March 28, 2017

AFCEC/CZN, Attention: ACC NEPA PM

Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

RE: Davis-Monthan Air Force Base-Angel Thunder

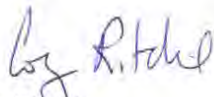
Dear Robin,

The Tucson community is excited to be able to support the Angel Thunder training exercise again in 2017. We have broad and strong ties across the community and can attest to the fact that this community overwhelmingly supports the base, the airmen and women, and this exercise.

We know and appreciate that Southern Arizona is a unique environment that is very conducive to these operations. Our weather and terrain provide the perfect opportunity to get the most out of the training and is very similar to the environments in which our airmen and women operate today. Our proximity to the Goldwater Range, the mountain and the ocean are unique in all of the U.S. and serves to maximize the training opportunities.

Davis-Monthan, the 162nd Fighter Wing and all of their personnel are among our greatest assets as a community and supporting them is one of our greatest blessings. We look forward to, again, being able to support Angel Thunder and the amazing training that it provides.

Sincerely,



Cody Ritchie
President
Crest Insurance Group, LLC
5285 E Williams Circle, Suite 4500
Tucson, AZ 85711

Bob Morken
5010 E. Calle Barril
Tucson, AZ 85718

March 30, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, Texas 78236-9853

RE: Support for Angel Thunder Environmental Assessment (EA)

Dear Ms. Divine,

Our business colleagues, friends and family are enormous supporters of Davis Monthan Air Force base, love having these professional airmen & women and crew around our community and feel great pride interacting with them. We encourage you to join our support for the Air Force holding the Angel Thunder exercise here.

Sunshine and blue skies = year-around training capabilities.

The nearby Goldwater Range = longer, more economical training.

Unrestricted flying space = training begins the moment their airborne.

Mountains, desert and proximity to the ocean = diversified training.

Local jurisdictions proven track record working with DMAFB = safety.

Local surveys show we are part of the overwhelming majority who view Davis Monthan Air Force Base and the 162 Fighter Wing as America's Assets and Tucson's Treasure. This includes 92% of the residents neighboring the base. Our public safety departments are ready, not least because they have been actively working and training with each other, locally simulating disasters of all sizes and types.

We welcome the Angel Thunder exercise and hope you will encourage it happening in Tucson.

Sincerely,



Bob Morken



FARMERS

Sandi Eghtesadi, LUTCF
Insurance and Financial Services Agent
4866 E. Broadway Blvd.
Tucson, AZ 85711-3610
Bus: 520-881-8000
Fax: 520-326-5598
www.YourTucsonAgent.com

March 31, 2017

AFCEC/CZN, Attention: ACC NEPA PM

Ms. Robin Divine

2261 Hughes Avenue Suite 155

JB SA Lackland, Texas 78236-9953

Subject: Support for Angel Thunder Environmental Assessment

Dear Ms. Divine:

I am writing this letter not to restate Tucson's obvious attributes of the weather, range, airspace, topography and a cooperation between local jurisdictions and DMAFB with a proven track record of actively working with each other – but as a citizen that has been blessed to have the opportunity to support and know the Airmen, both active as well as guard/reservists in the U.S. Military in Tucson, Arizona.

I sincerely love and respect our U.S. Airmen and their families and as the years go by since I first had the opportunity to volunteer in support of the base as an ESGR Volunteer in 2002 my personal commitment and respect grows stronger every day. Since then it has been an honor to be on the Board of three non-profits that support our Airmen in Tucson. I own a fairly large insurance agency and have dealt with literally thousands of like-minded Tucsonans who love our Airmen and continually look for ways to support them and their families as they watch out for us 24/7.

The Tucson Chamber of Commerce has been instrumental, along with our elected officials and the many civilian groups that serve different needs of our U.S. Airmen, including (but not limited to) the DM50, The 162nd Air Guardians and my personal non-profit to support needs of military members in crisis situation called Southern Arizona Military Support. There are many grassroots efforts in the retirement communities that have numerous functions to raise money and make life a little easier for our Airmen. I am just one of tens of thousands who love our military and have a desire to do what is right for them as they do selflessly for us every day.

I am not just speaking from my own feelings but surveys we have done as a community showing there is clear support for Davis Monthan and the 162nd Air Wing with the majority (92%) of residents close to DM and the 162nd Air Wing are at least moderately supportive and 73% at least strongly supportive. The collaboration necessary for this mission is similar to the

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Page Two

Letter to AFCEC/C2N, Ms. Robin Divine

partnership between DMAFB and The City of Tucson and every other town within Pima County. As budgets have been cut and sequestration continues it is our goal as a community to collaborate civilian and civic resources in new and creative ways to make it a win/win all around.

Tucson is a unique community with support on so many levels going both ways. It is my desire as a patriot and business owner to play my part and I am all in for any assistance you may request and will be happy to respond to any inquiries or concerns you may have.

Respectfully,

Sandi Eghtesadi
Sandi Eghtesadi - Cell (520) 235-9639

162nd Fighter Wing Air Gaurdians Board Member

Southern Airzona Defense Alliance Board Member

Southern Arizona Military Support Board Member

Employers Support of the Guard and Reserve (ESGR) – Vice Chair Southern Airzona

P.S. There are so many things to do in Tucson including a gentrified, vibrant downtown with World Class restaurants, on of the top Universities in the U.S., great public, charter and private schools and a Community that cherishes military families.

Edward R. & M. Ann Castelhana
12251 N. Klos Drive
Tucson, AZ 85742-8722

March 31, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

Reference: Angel Thunder at Davis-Monthan Air Force Base Tucson AZ.

Dear Ms. Divine:

My wife and I are residents in Tucson Arizona and wish to show our support for the Angel Thunder event to be held at Davis-Monthan Air Force base on a continuing basis. Our community has huge support for any and all missions at DMAFB. Based on the environmental assessment which shows no negative impact on the environment as well as being able to train our soldiers with the best possible conditions on search and rescue as well as other pertinent training issues DMAFB is the best possible location to do this training.

The collaboration necessary for this mission mirrors that of the partnership between DMAFB and the City of Tucson and every other town within Pima County. Public safety officials of all departments actively work and train together regularly to simulate a variety of disasters and prepare for them. Preparing for these types of emergencies and rescues will save lives and support our nation's defense.

When you consider our weather and our desert environment and the fact we have the Goldwater Range available there is no better place to prepare our 2700 men and women of the rescue forces to prepare. Thanks for your every consideration in approving this continuing event.

Sincerely,



Edward R. Castelhana



M. Ann Castelhana

Bruce L. Dusenberry
7090 N. Via Sierra Del Sol
Tucson, Arizona 85718

April 1, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

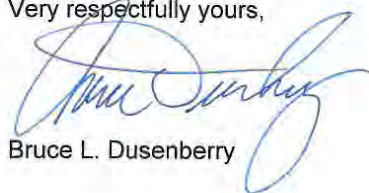
Dear Ms. Divine:

I am a resident of Tucson, Arizona and the owner of property in close proximity to Davis-Monthan Air Force Base. I have read the Draft Finding of No Significant Impact (FONSI) for an Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue (PR) Training Exercise in the Southwestern United States. I urge that this finding be confirmed and that no further environmental assessments (such as an EIS) be undertaken.

The Personnel Recovery/Rescue Training Exercise that is the subject of the Environmental Assessment is designated Angel Thunder (AT). The first one was organized in 2006 and it is now proposed to be conducted by ACC on a biannual basis with a maximum of 800 sorties, of which a maximum of 600 would originate at Davis-Monthan AFB. These operations in Southern Arizona will provide the most realistic training environment available to more than 2,700 USAF Rescue forces, as well as their Joint, Interagency, and International partners to engage in a variety of personnel recovery scenarios.

Davis-Monthan offers one of the best sites in the United States for flying and has the base logistics and community support necessary for this mission. The finding that this activity will have no significant adverse environmental impacts is important for this life-saving training to continue. I strongly urge you to support and adopt the FONSI as contained in the Draft document.

Very respectfully yours,



Bruce L. Dusenberry

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—Cumulative Impacts

Dear Ms. Devine,

The Angel Thunder Draft Environmental Assessment fails to adequately analyze cumulative impacts.

The Council on Environmental Quality, in the first paragraph of the Introduction to a comprehensive publication on cumulative effects, states

Evidence is increasing that the most devastating environmental effects may result not from the direct effects of a particular action, but from the combination of individually minor effects of multiple actions over time [*Considering Cumulative Effects under the National Environmental Policy Act* (U.S. Council on Environmental Quality, 2009)].

In other words, the incremental impact of an action may not in itself be significant. However, the incremental impact, taken together with the incremental impacts of other actions, may create very substantial consequences to the environment. The sum of the incremental impacts may be significant.

This is why the Angel Thunder EA is required to analyze the cumulative effects of *all* impacts, even though some incremental impacts may appear to be insignificant. 

40 CFR 1508.7 defines *cumulative impact* as

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The EA's analysis of cumulative impacts does not consider the impacts of past actions and of reasonably foreseeable future actions, and it fails to adequately consider the impacts created by other governmental and non-governmental entities. 

The EA provides no quantitative analysis of the cumulative impacts. 

Number: 1	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 2:58:02 PM
Comment addressed in revised Section 5. Section 5.1.1 discusses the review of cumulative impacts at the macro level. Table 5-1 displays a series of military actions that represent past, present, and future actions undertaken by the USAF within the region of influence at the macro level.			
Number: 2	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 1:49:27 PM
Comment addressed in Section 5.1.1, Table 5-1, which includes past USAF actions within the region of influence at the macro level.			
Number: 3	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 1:48:09 PM
Comment addressed in Section 5.1.1, paragraph 3, which calculates the total number of annual sorties that would result from past, present, and future operations.			

Cumulative impacts must include all other past and present operations at Davis Monthan AFB. The U.S. Environmental Protection Agency makes this clear: 

The NEPA analysis should establish the magnitude and significance of cumulative impacts by comparing the environment in its naturally occurring state with the expected impacts of the proposed action when combined with the impacts of other actions. [*Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (EPA, 1999); hereinafter referred to as *Consideration*.]

Past and current activities at Davis Monthan affect many aspects of the environment, including (but not limited to) noise, air pollution, groundwater pollution, demands upon public infrastructure and resources, property values, health of nearby residents, learning abilities of students, and environmental justice. In its analysis of past and present cumulative impacts, the EA must separately consider each of these aspects.

Cumulative impacts are not limited to activities at Davis Monthan. Cumulative impacts encompass all actions of all entities within the Angel Thunder Region of Influence. 40 CFR 1508.7 and *Consideration* both make this clear. 

Proper analysis of cumulative impacts requires much more than a generalized narrative description. The impacts must be quantified. 

“Trends analysis, or how the resource condition has changed over time, is the most useful tool for looking at the accumulated effects of past actions,” *Consideration* states. Trends analysis is equally useful for looking at the effects of future actions. “The analysis should include the use of trends information and interagency analyses on a regional basis to determine the combined effects of past, present, and future actions,” says *Consideration*.

Trends analysis can help determine reasonably foreseeable future actions, such as future increases in vehicular traffic in the Region of Influence, future increases in air traffic at TIA, and future population densities in the areas around Davis Monthan.

The legal system has provided guidelines for the term “reasonably foreseeable future actions.” According to *Consideration*, “Court decisions on this topic have generally concluded that reasonably foreseeable future actions need to be considered even if they are not specific proposals.”

The Angel Thunder EA fails to carefully consider numerous reasonably foreseeable future actions from all entities within the Region of Influence. Following are two examples, both from the Air Force itself. The first is a specific proposal; the second is not, but it nevertheless falls within the courts’ guideline for a “reasonably foreseeable future action.” 

Number: 1	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 1:50:12 PM
Comment addressed in Section 5.1, Table 5-1, which includes the past and present operations at Davis-Monthan AFB.			
Number: 2	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 2:08:40 PM
Comment addressed in Section 5.1.1, Table 5-1 which includes all past, present, and future actions undertaken by USAF within the macro level region of influence. Section 5.1.1, paragraph 3 also discusses the analysis of the macro level region of influence.			
Number: 3	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 2:05:44 PM
Comment addressed in Section 5.1.1, Table 5-1, which includes past, present, and future USAF projects within the macro level region of influence. Quantitative analysis of the annual number of sorties associated with past and present operations is included in Section 5.1.1, paragraph 3.			
Number: 4	Author: MSHELBY	Subject: Sticky Note	Date: 4/25/2017 2:09:53 PM
Comment addressed in Section 5.1.1, Table 5-1, which includes past, present, and future USAF projects within the macro level region of influence.			

First: The Air Force intends to eliminate all A-10s. The Air Force wants to accomplish this quickly; Congress may decide to delay it by a few years. In either case, elimination of all A-10s is a specific proposal, and is a reasonably foreseeable future action.

The A-10s will be replaced with louder aircraft; Davis Monthan's 355th FW, for example, intends to replace its A-10s with F-16s. In addition, for all three of the EA's alternatives, noise levels will increase as Angel Thunder A-10s are replaced with louder aircraft. Analysis of cumulative impacts of reasonably foreseeable future actions must include a careful assessment of the replacement of Angel Thunder and 355th A-10s.

Second: The Air Force intends to replace most fighter aircraft with F-35As. Then-current aircraft of Davis Monthan's 355th FW will be replaced with F-35As; many Angel Thunder aircraft will also be replaced with F-35s. The Air Force's intent to bring F-35As to both TIA and Davis Monthan is corroborated by a July 15, 2014, letter written by Ms. Kathleen I. Ferguson, Acting Assistant Secretary of the Air Force. Assistant Secretary Ferguson wrote, "Tucson Air Guard Station and Davis-Monthan AFB may be considered in the next round of F-35A basing, which will likely begin in the next few years."

In a front-page interview with DM's Base Commander, Col. Scott C. Campbell, the *Arizona Daily Star*, in an article titled, "New Commander Campbell Expects Increase in Missions" (September 29, 2016) stated:

D-M is in the running as a potential site for a new drone squadron, F-16 fighter training units and a Reserve squadron of F-35 Joint Strike Fighters, the Air Force has been saying since late last year [2015].

In an email two years ago, in March of 2015, Lt. Col. Kevin Eilers, the 355th Operations Group Commander at DMAFB, wrote, "I DO expect the F-35 use of airspace to increase" [emphasis in original].

F-35s have been transient aircraft at DMAFB for more than two years. While their beddown at Davis Monthan is not yet a specific proposal, it falls within the courts' guideline for reasonably foreseeable future actions.

These and all other reasonably foreseeable future impacts must be included in an analysis of cumulative impacts, even though they may also be analyzed again in the future by EAs and EISs that are specific to their impacts.

This is the law.

Sincerely,


Gary A. Hunter

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—DNL

Dear Ms. Devine,

The Angel Thunder EA provides no analysis of noise, aside from DNL. 

In 1974, the U.S. Environmental Protection Agency recommended the use of DNL for analysis of noise impacts. Forty-three years later, Federal agencies still use DNL analysis. Nothing precludes any Federal agency from using additional metrics, though; in fact, in California, airports are *required* by a court decision to use single-event metrics to analyze noise impacts.

An individual reacts differently to different types of noise. The individual's reaction to the continual white-noise sound of a creek is quite different from his reaction to a sudden sharp sound that is many times louder than low background noise. DNL makes no distinction between the two types of noise, however. Each might be averaged to 65 dBA DNL.

The current Joint Land Use Study for Tucson and Pima County, prepared with the assistance of the Department of Defense for Davis Monthan AFB, states in Paragraph 5.1.1. "Aircraft noise can be experienced as particularly annoying because its sudden onset may startle people."

Is the noise of a loud flyover equivalent to the continuous low-level sound of a stream? According to DNL metrics, it is.

The Department of Defense recognizes that DNL is inadequate:

While the Federal government has accepted DNL as the best metric for land use compatibility [which is not a major focus of the AT EA], describing noise exposure solely with DNL may not be adequate to achieve broad public understanding of noise exposure [*Using Supplemental Noise Metrics and Analysis Tools* (Department of Defense, 2009)].

The same DoD publication states:

[S]upplementing DNL . . . with additional noise exposure metrics improves public understanding of noise exposure and decision makers' ability to make better informed decisions.

The Department of Defense stipulates the best noise metric:

To assess the impact of this transitory noise [of an aircraft] . . . the Sound Exposure Level, or SEL, is the best measure of the annoyance response” [*Operational Noise Manual: An Orientation for Department of Defense Facilities* (Operational Noise Program, 2005)].

Despite DoD’s prescription, the Angel Thunder EA fails to include any SEL analysis of noise impacts. 

Several Department of Defense publications provide detailed guides for the use of noise metrics that yield much better analyses of aircraft noise than DNL does. A separate comment letter, whose subject line is “Department of Defense Guides for Noise Analysis,” provides references to some of the relevant DoD publications. The letter also describes several specific noise metrics.

One of the publications [*Improving Aviation Noise Planning, Analysis and Public Communications with Supplemental Metrics* (Department of Defense, 2009)] includes real-life results of the additional metrics. One of several notable results depicts the Naval Air Station at Whidbey Island WA. The SEL 90 dB contour covers far more area than the DNL 65 dB contour does. In fact, the SEL 90 dB contour encompasses urban areas and heavily used state parks.

DNL contours do not reveal critical information such as that.

The Air Force is required by NEPA to make a good-faith effort in its analysis of noise. A good-faith effort must include the appropriate use of supplemental metrics.

DoD’s *Operational Noise Manual* (cited above) warns that even a good-faith effort is not sufficient if it is wrong. The publication cites a Massachusetts case:

The court ultimately found that the USAF had indeed made a good-faith effort to estimate the noise but [the court’s] decision still allowed for citizen recourse if the Environmental Impact Statement estimated noise impacts were exceeded. Thus, litigation continued. . . .

The case ended with substantial settlements to 42 families.

Without careful and thoughtful use of supplemental noise metrics, the Air Force cannot conclude that Angel Thunder impacts are not significant, and that a FONSI is justified. To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, the impacts of aircraft noise must be analyzed with the appropriate supplemental metrics.

Sincerely,


Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—DNL and Annoyance Response

Dear Ms. Devine,

The Air Force and many other agencies use the DNL metric to determine community annoyance as a function of noise. The only tool available to make this correlation between DNL decibels and community annoyance is the Schultz Curve (and its successor curves).

Shortcomings of the DNL metric and of the Schultz Curve have been detailed in academic papers, in publications of the Federal Aviation Administration, and in publications of the Department of Defense.

Sanford Fidell is a noted acoustician, researcher, and author of books on the subject of acoustics. In one of his papers ("The Schultz Curve 25 Years Later: A Research Perspective," *Journal of the Acoustical Society of America*, 2003) he made some pointed observations about DNL, and about its correlation with community annoyance (the Schultz Curve). Below are four of his points from that paper:

Although U.S. federal adoption of an annoyance-based rationale for regulatory policy has made this approach a familiar one, it is . . . not necessarily the most useful for all purposes.

(In other words, Federal agencies commonly use annoyance—the Schultz Curve's correlation of annoyance with DNL—to assess the impacts of noise. However, for many purposes, other methods of assessing the impacts of noise are more useful.)

It is for reasons of expedience rather than any conclusive demonstration of causality that DNL intentionally combines into a single index and thus confounds all of the primary physical characteristics of noise events that could arguably cause noise-induced annoyance.

(In other words, DNL is a convenient way to assess noise, but its usefulness has never been demonstrated. DNL is flawed; it combines many different types of noise, each of which has different physical characteristics, into a single number.)

In the United States . . . [the progress] in understanding of community reaction of noise [has ceased] as of a quarter century ago, [which has] led to repeated misprediction of community reaction to noise exposure, and generally reinforced policies that do not accomplish their own goal.

(In other words, because so many agencies—including the Air Force—use DNL and the 43-year-old Schultz Curve as their primary noise metric, research has essentially halted on better predictors of noise vs. community reaction. This continuing dependence on a 43-year-old metric reinforces the tendency of government agencies to rely on outdated noise policies.)

Overreliance on officially predicted annoyance prevalence rates to assess community reaction to aircraft noise has also created an institutional disconnect between local and federal perspectives. For all practical federal purposes, “community reaction to noise” means little more than an annoyance prevalence rate estimated by an assumption laden fitting function [the Schultz Curve].

(In other words, because Federal agencies assess noise impacts by relying almost entirely on DNL and its Schultz-Curve correlation with annoyance, the Federal assessments do not agree with local perspectives.)

The Department of Defense understands just how flawed the Schultz Curve is. In *Using Supplemental Noise Metrics and Analysis Tools* (2009), DoD states

It should be noted that the dose-response relationship between DNL and annoyance varies over a wide range and is extremely location dependent. **Thus it is inadvisable to use the average annoyance [Schultz] curve to predict the specific number or percentage of the local exposed population who are expected to be highly annoyed by aircraft operations at a given DNL.** [Emphasis in original.]

This creates a major problem: The Angel Thunder EA is mandated to use the DNL metric. The DNL metric is useful primarily as a predictor of community annoyance. The tool that correlates DNL with community annoyance is the Schultz Curve. The Department of Defense, in the statement above, advises against using the Schultz Curve. Without the Schultz Curve, the DNL metric is nearly meaningless.

Because the Schultz Curve is flawed, and because the DNL metric (including DNL contours) provide insufficient information to the Air Force decision-makers and to the affected community, the Angel Thunder EA must use supplemental metrics to reliably assess the impacts of noise.

Appropriate supplemental metrics are described in other comment letters for this EA.

Sincerely,



Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Re: Angel Thunder—Department of Defense Guides for Noise Analysis

Dear Ms. Devine,

The Angel Thunder EA uses only one method to analyze the impacts of noise: DNL. The Environmental Protection Agency recommended the use of the DNL metric in 1974,

This EPA recommendation is forty-three years old.

EPA's 1974 DNL recommendation, and DNL's continued use, comes from a purported—but long-discredited—relationship between DNL and community annoyance.

The Department of Defense warns against using DNL, because it does not correctly predict community annoyance. DoD cites “methodological questions, errors in measurement of both noise exposure and reported annoyance, data interpretation differences, and the problem of community response bias . . . [and] an extraordinary amount of scatter in the data.” [*Community Annoyance Caused by Noise From Military Aircraft Operations* (Department of Defense, 2009).]

According to the Department of Defense,

The Military Services of the U.S. Department of Defense (DoD) have long relied on traditional methods of analyzing aircraft noise using the Day Night Average Sound Level (DNL) metric. . . . Recently, however, a need has been identified to use other supplemental analysis tools and noise metrics for two reasons: (1) to produce more detailed noise exposure information for the decision process; and (2) to improve communication with the public about noise exposure from military activities. Better communication with all stakeholders and the general public is clearly a benefit to both the Military and the adjacent communities. [*Improving Aviation Noise Planning, Analysis and Public Communications with Supplemental Metrics* (Department of Defense, 2009); hereinafter referred to as *DoD Supplemental Metrics*]

Because the AT EA uses only DNL to analyze the impacts of noise, it fails to fulfill DoD's two objectives directly above—producing more detailed noise exposure information for the decision process, and improving communication with the public about noise exposure from military activities. 

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:23:30 PM

Comment addressed in Section 3.1.2.1, paragraph 4, which states that the data used for the noise analysis is the best available information at this time and has been carried forward as a comparative baseline to determine the effects of future actions under NEPA. Please also see Appendix E, which provides a technical description of the noise modeling, the operational information used to model the noise footprints, and maps of the footprints.

DoD Supplemental Metrics establishes guides to provide “more useful information on the noise environment than is available through solely using the long-term, cumulative metrics such as DNL.” Other DoD publications also provide guides for noise metrics that are more useful than DNL.

DoD Supplemental Metrics explains why analyses such as the AT EA are mistaken to rely solely on DNL metrics:

When using DNL to communicate noise exposure to the average citizen residing near a military airfield, a typical response is, “I don’t hear averages, I hear individual airplanes.” Airport neighbors often become angry and frustrated trying to understand explanations of noise exposure solely in terms of average sound energy with the DNL metric, particularly when they are trying to grasp the impact of . . . increased operations and aircraft changes.

Relying solely on DNL metrics can create problems at later dates. Here are two examples:

Dallas-Fort Worth International Airport was sited on about 18,000 acres of land in the early 1970s, even though its projected Ldn [DNL] 65 dB cumulative noise exposure encompassed far less area. Likewise, Denver International Airport was sited on about 29,000 acres, even though its projected Ldn [DNL] 65 dB cumulative noise exposure contour was considerably smaller. Both of these greenfield airports have nonetheless attracted tens of thousands of aircraft noise complaints over the years, some from communities many miles from their Ldn [DNL] cumulative noise exposure contours. [*The Schultz Curve 25 Years Later: A Research Perspective* (Fidell, 2003)]

To avoid similar problems at DMAFB, the Air Force must heed *DoD Supplemental Metrics*:

While the Federal agencies have accepted DNL as the best metric for land use compatibility guides [which is not a major focus of the AT EA], reducing the description of noise exposure to a single value of DNL may not help the public understand noise exposure. Simply looking at the location of their home on a DNL contour map does not answer the important questions: how many times airplanes fly over, what time of day, what type of airplanes, or how these flights may interfere with activities, such as sleep and watching television. The number and intensity of the individual noise events that make up DNL are critically important to public understanding of the effects of noise around airports. What is needed is a better way to communicate noise exposure in terms that are more easily understood. Supplementing DNL with additional metrics will help the public better understand noise exposure.



Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:23:48 PM
How many times an aircraft would fly over a particular area and at what time of day is dependent upon the proposed training activity. Section 2.1.1 and Table 2-1 describe the type of training that would occur at each location. Aircraft proposed for use is discussed in Section 2.1.1.1, paragraph 3. The average daily aircraft operations are listed in Appendix E, Table E-1.

DoD Supplemental Metrics quotes a publication of the Australian Government:

In simple terms people want to be told about aircraft noise exposure in their own language – where flight paths are, how many movements, what time of day, etc. – but the official response has been to provide information in the form of a single figure Australian Noise Exposure Forecast (ANEF) value, similar in concept to the DNL metric. Not unnaturally there has frequently been a breakdown in communication between the “noise expert” and the community, which we consider has been at the expense of both parties.

. . . Providing “real” aircraft noise information for all of the areas likely to be subject to changes in aircraft noise enables the community to actively and meaningfully participate in any public consultation process. It also gives the decision makers a much clearer picture of what the outcomes will be if they approve the project. [*Expanding Ways to Describe and Assess Aircraft Noise* (Australian Department of Transportation and Regional Services, 2000)]

DoD Supplemental Metrics provides detailed guides for the analysis and presentation of

- Maximum A-Weighted Sound Levels (Lmax)
- Sound Exposure Level (SEL)
- Equivalent Sound Level
- Time Above a Specified Sound Level (TA)
- Number-of-Events Above a Specified Sound Level (NA)
- Respite

At least some of these metrics can be calculated and analyzed with NOISEMAP. Because the AT EA uses NOISEMAP for its DNL metric, the inputs for these additional metrics may already be complete.

DoD Supplemental Metrics recommends that results of the above metrics be presented in tables and/or as contour lines on maps (just as the AT EA presents DNL contour lines). The publication includes several real-life examples of both.

The contour maps are particularly striking. At a glance, they provide very important information that is totally absent from DNL metrics. One example is attached; it depicts Marine Corps Air Station Cherry Point, in North Carolina. The 65 dB DNL contour line is red; the single-event contour line for 90 dB SEL is blue. Note that, at its northernmost point, the 90 dB SEL contour extends nearly nine miles beyond the DNL 65 dB contour.

This is crucial information. As *DoD Supplemental Metrics* explains, the above metrics “are as important to the project stakeholders as they are to communicating with the general public, because they enable the project managers and decision makers to make better-informed decisions.”

Failure to include these metrics can lead to litigation. *DoD Supplemental Metrics* describes one successful lawsuit:

The City of Oakland CA prepared the required Environmental Impact Report (EIR) to analyze the consequences of their proposed Airport Development Plan for the Metropolitan Oakland International Airport. Its adequacy in defining nighttime noise impacts solely with the DNL noise metric was challenged in court by a citizens group and in its decision, the California appeals court set a precedent (at least in California) that DNL 65 dB is not a sufficient criteria to use in Environmental Impact Reports for this purpose and that single event noise levels must also be considered.

Without careful and thoughtful use of the supplemental noise metrics, the Air Force cannot conclude that Angel Thunder impacts are not significant, and that a FONSI is justified.

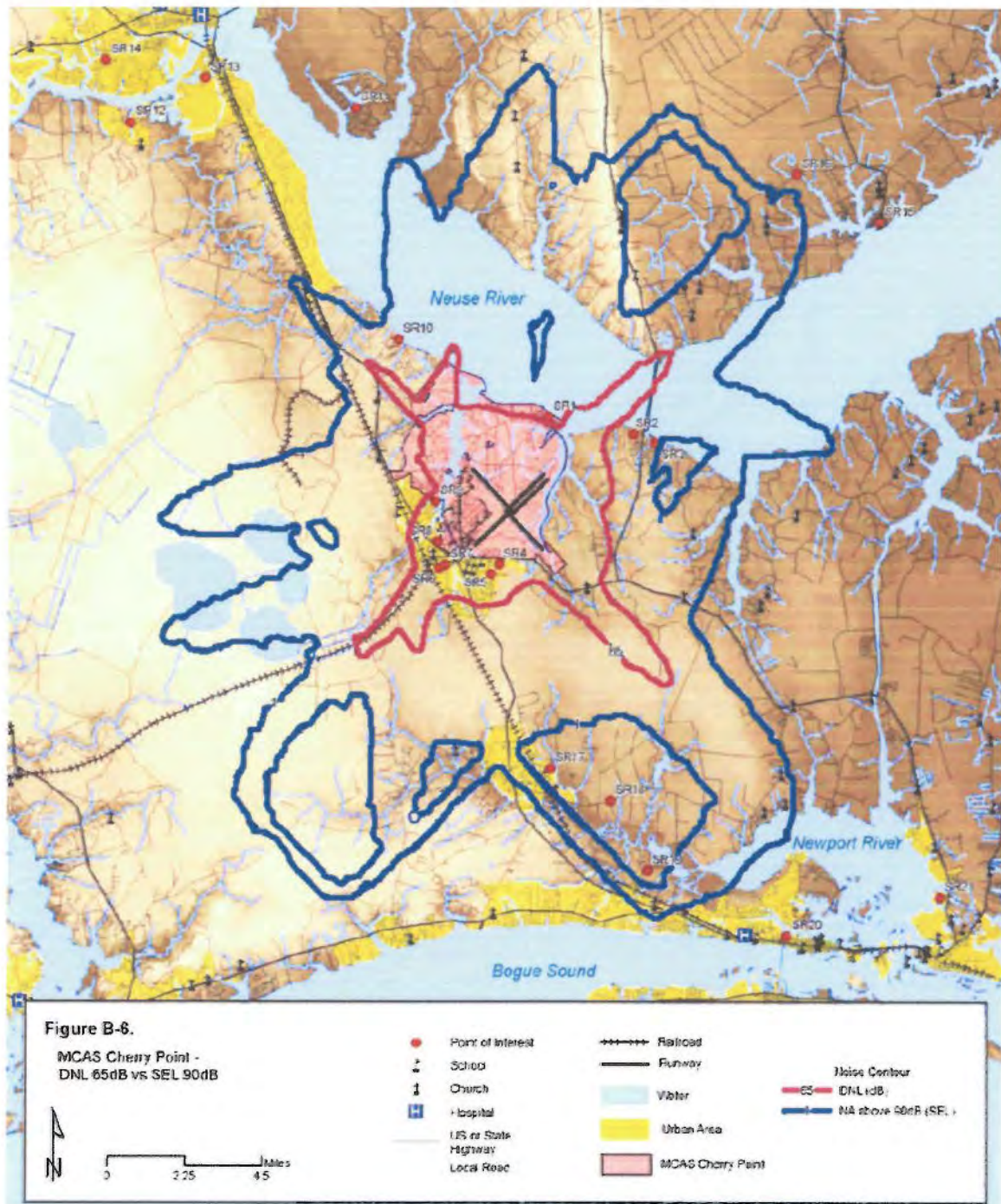
To ensure the final decision regarding the AT EA will withstand legal challenges, the impacts of aircraft noise must be analyzed with the appropriate supplemental metrics.

Sincerely,



Gary A. Hunter
Resident of Tucson

Attachment to Angel Thunder EA Comment Submittal
 Re: Angel Thunder—Department of Defense Guides for Noise Analysis



Marine Corps Air Station Cherry Point, NC (contours highlighted)
 Figure B-6, page B-16, *Improving Aviation Noise Planning, Analysis and Public Communications with Supplemental Metrics* (Department of Defense, 2009)

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—Inappropriate Averaging

Dear Ms. Devine,

Under the Proposed Action, Angel Thunder exercises will be performed twice per year, with each exercise lasting about two weeks (including mobilization).

The Angel Thunder EA analyzes noise impacts solely with DNL, which is a year-long average. A year-long average is not appropriate for an exercise that lasts only 14 days. The EA's conclusions, based on its year-long averaging of a total of four weeks' operations, is extremely misleading.

Table E-1 shows that, over the course of 365 days, Angel Thunder operations will average 6.58 per day. Total AT activity will be

$$6.58 \times 365 = 2401.7 \text{ operations per year}$$

However, AT operations will actually occur for only about 28 days per year. Therefore, daily operations will average

$$2401.7 / 28 = 85.78 \text{ operations per day.}$$

This is far more than the 6.58 operations per day that the AT EA claims.

Table E-1 shows that, excluding AT aircraft, total base operations per day are 179.5. During AT activities, operations at DMAFB will increase by

$$85.78 / 179.5 = 47.8\%.$$

On the days that traffic of A-10s, C-130s, HH-60s, etc. will increase over midtown neighborhoods by nearly fifty percent, the residents will be significantly disturbed.

The AT EA is quite wrong to allege, as it does on page 4-2, that the increased noise "would be nearly indistinguishable from baseline conditions;" that the increased noise "would have a minute, incremental impact;" that the increased noise "would not be perceptible when compared to baseline conditions."

That is how the AT EA describes a nearly 50% increase in noise.

Because the AT EA averages the noise over 365 days, and not over the 28 days of AT's annual operations, the DNL contours for the Proposed Action are nearly identical to the contours of the baseline. This is highly misleading, at best.

In April of 2016, Lieutenant General John B. Cooper issued Air Force Instruction 32-7070. Compliance with the publication is mandatory.

In subsection A2.8.2.3., Lt. Gen. Cooper writes

When necessary for environmental analysis or public outreach, operations for short-term military training exercises may be calculated based on the duration of the event and presented as short-term DNL/CNEL contours to supplement the traditional DNL contour.

If the Air Force has any desire to avoid misleading the public and its own decision-makers, it will incorporate short-term DNL analysis in the AT EA.

Further, as noted in other comment letters, as well as in various DoD publications, DNL is itself misleading. Supplemental metrics are required to portray the true impacts of noise.

Lt. Gen. Cooper agrees. In A2.8.3.1, he writes

Supplemental metrics are intended [to] enhance the understanding of pertinent facts surrounding the change in the noise environment. These may include the use of metrics such as Equivalent Sound Level (Leq) or single event metrics such as SEL and Lmax, or descriptions of the noise environment in terms of the number of times or minutes of exposure at a specific location during an average day.

To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, the impacts of noise must be analyzed properly, and in a manner that does not mislead the stakeholders.

Sincerely,



Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Re: Angel Thunder—Noisemap Inputs

Dear Ms. Devine,

A PowerPoint presentation, prepared by the Department of Defense for the 2011 Sustaining Military Readiness Conference in Nashville TN, discusses Noisemap. It states:

The two most important data points are flight tracks and flight details. These dominate the shape & extent of the noise contours around the runway; the more detail included in their description the more accurate the contours. The next most important factor is how the operations are distributed among the flight tracks.

The flight tracks and flight details, as presented by the Angel Thunder EA, can be described only as vague. In fact, the EA includes virtually no information about flight profiles, which are critical Noisemap inputs. ¹

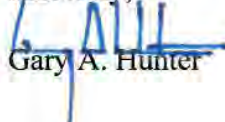
Aside from distinguishing between fixed-wing and rotor-wing aircraft, the EA's arrival and departure flight tracks fail to differentiate among the many aircraft types that use DMAFB. To ensure accurate outputs, Noisemap inputs must include—for example—which flight tracks a C-130 uses, and how many operations it performs on each flight track. ²

The flight tracks themselves are grossly inaccurate. For example, no rotor-wing tracks over midtown Tucson are depicted. In fact, HH-60s and variants regularly approach and depart over midtown, flying in northwesterly and southeasterly directions.

If the Angel Thunder program is expanded, rotor-wing tracks will increase over midtown. For example, AT helicopters will practice landings at Banner UMC hospital in the heart of midtown. None of this is shown on the flight tracks.

The only conclusion that can be drawn from the above facts is that the Noisemap inputs were grossly erroneous. Erroneous inputs yield erroneous outputs, and erroneous DNL contours.

Sincerely,


Gary A. Hunter

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:29:42 PM

See Appendix E, Section E.1, paragraph 4. This paragraph states that the data used in the analysis of Davis-Monthan AFB operations using NOISEMAP Version 7.3 was supplemented by flight track, flight profile, and ground-run up information.

Number: 2 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:32:42 PM

See Appendix E, Section E.5. This paragraph states that noise data from the aircraft noise database in NOISEMAP were used to model operations for all aircraft types.

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—Maximum A-Weighted Sound

Dear Ms. Devine,

First:

The Angel Thunder EA states on page 3-5:

The dBA noise metric describes steady noise levels, although very few noises are, in fact constant; therefore Day-Night Sound Level (DNL) has been developed.

This is quite incorrect; dBA does not describe “steady noise levels.”

Nearly all noise metrics are defined in terms of dBA. Some examples include SEL, L_{eq} , L_{max} , L_{pk} , NA, TA, and even DNL. Most of these metrics are averages of dBA levels, which vary from instant to instant. Their purpose is to convert the continuously fluctuating dBA levels into “steady noise levels”—i.e., averages.

Further, DNL was not developed to counter any “shortcomings” of the dBA metric. Instead, it was created to depict a year-long average of instantaneously varying dBA levels.

Second:

The Angel Thunder EA states on page 4-6, “A good predictor of annoyance at airfields and training locations with fewer than 200 operations per day is the maximum A-weighted sound.” Page E-3 confirms that DMAFB has fewer than 200 operations per day.

Acoustics experts and the Department of Defense agree that DNL is a poor predictor of annoyance. (See comment letters with the subjects “DNL,” and “DNL and Annoyance Response.”)

The AT EA is deficient, then, to rely solely on the defective DNL as a measure of noise impacts, and to ignore the maximum A-weighted measure, which it acknowledges is a “good predictor.”

Third:

The EA's Table 4-4 shows the percentage of people who are "Highly Annoyed" by various maximum A-weighted sound levels. (It does not show the percentage of people who are moderately annoyed, or who are slightly annoyed.)

The EA's Table 4-3 shows maximum A-weighted sound levels from three helicopters at various slant distances. It provides no information for fixed-wing aircraft involved in Angel Thunder operations, or for other aircraft that contribute to the cumulative impacts in the vicinity of DMAFB.

When approaching Runway 12, aircraft fly at an altitude of 2,800 feet AGL. When three miles out, they descend to 1,500 feet then enter the overhead pattern.

From information provided by DM's Scott Hines, and from the EA's Table 4-4, we can easily determine the percentage of Tucson's midtown residents who are "Highly Annoyed" by various aircraft flying over their homes.

At 2,800 ft. AGL

<u>Aircraft</u>	<u>Max dBA</u>	<u>% "Highly Annoyed"</u>
A-10	74	11%
C-130	77	16%
F-16	86	29%
F-18	98	(off the chart; interpolate to 42%)

At 1,500 ft. AGL

<u>Aircraft</u>	<u>Max dBA</u>	<u>% "Highly Annoyed"</u>
A-10	85	28%
C-130	84	27%
F-16	92	(off the chart; interpolate to 38%)
F-18	105	(off the chart; interpolate to 57%)

The EA fails to provide any such basic analysis. Because it relies only on DNL contours and omits all consideration of the "good predictor," Max dBA, the AT EA is grossly deficient.

Sincerely,


Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JB SA Lackland TX 78236

Re: Angel Thunder—Impacts Outside DNL 65 dBA Contour

Dear Ms. Devine,

The Angel Thunder EA provides no substantive analysis of noise impacts outside the DNL 65 dBA contour. This omission must be corrected. ¹

In 2009 the U.S. Transportation Research Board conducted a survey of managers of 35 airports throughout the United States [*Compilation of Noise Programs in Areas Outside DNL 65* (Transportation Research Board 2009)]. The findings include:

- A majority of respondents (83%) indicated that noise issues outside DNL 65 were “important,” “very important,” or “critical” to their airport.
- Almost three-quarters of respondents (74%) indicated that more than 75% of their airport’s noise complaints come from people who live outside DNL 65.

A Department of Defense publication discusses DNL 65 dBA contour lines. It concludes, “Clearly, it is not the intent of Federal policy to communicate that noise stops at that [DNL 65 dBA contour] boundary” [*Improving Aviation Noise Planning, Analysis and Public Communications with Supplemental Metrics* (Department of Defense, 2009)].

In response to requirements of the Noise Control Act of 1972, the EPA issued an influential publication that is commonly referred to as “The Levels Document.” This document states that noise should not exceed DNL 55 dBA in order “to protect public health and welfare,” in the words of the Noise Control Act.

Another EPA publication [*Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (Environmental Protection Agency, 1974)] states:

Outdoor yearly levels on the Ldn [DNL] scale are sufficient to protect public health and welfare if they do not exceed 55 dB in sensitive areas (residences, schools, and hospitals). . . . Maintaining 55 Ldn [DNL] outdoors should ensure adequate protection for indoor living.

Many Federal and state agencies consider any property that is subject to DNL 65 dB or more to be “not compatible with residential use.” The Arizona Revised Statutes impose severe restrictions on the use of properties that lie within the DNL 65 dB contour. By

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:46:16 PM

Please see Section 3.1.2.1, paragraph 4, which states that the 65 dBA DNL is the noise level below which generally all land uses are compatible; therefore, analyses of noise levels below 65 dBA were not included in this analysis.

electing to not carefully consider all impacts outside the DNL 65 dB contour, the EA wrongfully concludes that, if a property is not subject to legal restrictions because of severe noise, then its impacts are so negligible as to be unworthy of consideration.

The AT EA must analyze all noise impacts throughout the entire Region of Influence. Supplemental noise metrics, as described in other comment letters, will yield the best analyses of impacts outside the DNL 65 dB contour. Further, as described in other comment letters, the analyses must evaluate cumulative impacts. The analyses must also be quantitative; a narrative listing of impacts is not sufficient.

Without a careful quantitative analysis of the impacts of aircraft noise beyond the DNL 65 dB contour, the Air Force cannot know whether the impacts are significant, and cannot conclude that a FONSI is justified.

To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, the impacts must be properly analyzed.

Sincerely,



Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JB SA Lackland TX 78236

Re: Angel Thunder—Reliability of Noisemap

Dear Ms. Devine,

To determine the noise impacts that Angel Thunder will bring to Tucson, the EA relies not on actual noise measurements, but on computer modeling. The modeling was performed by Noisemap Version 7.3.

Is Noisemap reliable?

In the decades since Noisemap was introduced, only a single verification study has been performed. The study is described in *Field Studies of the Air Force Procedures (Noisecheck) for Measuring Community Noise Exposure from Aircraft Operations* (R.A. Lee, 1982), hereinafter referred to as *Field Studies*.

The study was performed at Laughlin AFB and Homestead AFB. It was made in 1979, thirty-eight years before the draft Angel Thunder EA was released.

Technology has changed since 1979. For example, *Field Studies* was composed on a typewriter, which is far removed from today's digital word processing. Similarly, the measuring equipment used in the 1979 test—and the fascinating description of their calibration process in *Field Studies*—belong in a museum. Just as digital word processing has succeeded typewriters, digital sound monitoring equipment has far surpassed the abilities and accuracy of 1979's vacuum-tube equipment.

Similarly, aircraft technology has changed. At Laughlin, the 1979 test measured the noise of T-37s and T-38s, which were introduced by Cessna in 1958 and 1959. At Homestead, the test measured the noise of F-4s, which were introduced by McDonnell in 1960. The noise profiles of these aircraft are quite different from the noise profiles of the aircraft—both fixed-wing and rotor—that Angel Thunder currently uses and proposes to use.

Field Studies documents substantial problems with testing procedures at both Laughlin and Homestead.

At the 2011 Sustaining Military Readiness Conference, sponsored by the Department of Defense, Ms. Lynn Engelman (Manager, Air Force Noise and Encroachment Management Program) gave a presentation on Noisemap. Ms. Engelman's presentation

stated, “The two most important [Noisemap input] data points are flight tracks and flight profiles.”

In the 1979 verification test at Laughlin, flight tracks and flight profiles for the noise events were not noted. No record was made of the two most important Noisemap input data points.

During testing at Laughlin, two of the four noise monitors failed, and could not be restored to service. Six locations were to have been monitored but, at the test’s conclusion, complete data was obtained for only two of the six locations, and incomplete data was obtained at a third location.

The wind shifted during a substantial portion of the testing at Laughlin; approaches and departures switched from their usual direction. “This was causing our measurement period to be not representative of the yearly averaged operations at Laughlin,” *Field Studies* notes.

“After the problems encountered at Laughlin AFB,” *Field Studies* states, “a less ambitious test was planned for Homestead AFB.” Monitoring locations were reduced to three. Of the three noise monitors used, one failed the first day, but was subsequently repaired and returned to service. Another noise monitor was stolen partway through the testing.

At Homestead, flight paths and flight profiles were noted for most—but not all—noise events. Despite incomplete data due to problems with the noise monitors, test results were not as flawed as they had been at Laughlin.

Field Studies describes the results: “The data at Laughlin showed good agreement at one location and a definite disagreement at two other sites between the measured and Noisemap predicted values.” Of Homestead data, *Field Studies* notes “differences between measured and Noisemap predicted DNLs.”

The discrepancies between measured noise levels and Noisemap’s predicted levels were resolved by entering different input data into Noisemap. This produced different predicted levels. “After correcting the erroneous operation inputs to Noisemap,” *Field Studies* states, “we had excellent agreement at both measurement locations.”

This is an ingenious—if not quite honest—solution to the problem. If Noisemap produces erroneous outputs because its software architecture is flawed, change the input data until the outputs match the measured noise levels. With this, *Noise Studies* could conclude, “we had excellent agreement.”

The information in the paragraphs above should provide an answer to the basic question: Is Noisemap reliable?

Consider these points:

- The only known test of Noisemap's reliability was conducted in 1979.*
- Verification testing was conducted with equipment that is very primitive by today's standards.
- Noise was measured of T-37, T-38, and F-4 trainer aircraft, which date from more than a half-century ago. Their noise profiles are quite different from the noise profiles of Angel Thunder's current and proposed fixed-wing and rotor aircraft.
- Many problems were encountered during the test's noise measurements, which resulted in incomplete data at both Laughlin and Homestead sites.
- Actual noise measurements did not correlate well with Noisemap's predictions of noise. Discrepancies were resolved by altering the data that was input to Noisemap.
- The verification test was performed with an early version of Noisemap. The current version of Noisemap is several generations removed from the 1979 version.

Noise analysis is the foundation of the AT EA. Noisemap is the foundation of the EA's noise analysis.

Again, the question: Is Noisemap reliable?

Now, the answer: Nobody knows.

Because the reliability of Noisemap is unknown, the significance of AT's noise impacts is unknown. The EA cannot conclude that noise impacts are not significant and that a FONSI is justified.

* The Air Force has alleged that a NATO test, performed at Narvik, Norway in 1994, also verified Noisemap's reliability. In fact, the Narvik results, published in 1997, mentions Noisemap only in its introduction and in its list of references. The study merely analyzed the effects of terrain on the propagation of aircraft noise. Nicole Dalrymple, Chief of Community Relations for the 355th FW at Davis-Monthan, wrote in a July 1, 2015, email that the Narvik study "was never intended to verify Noisemap in a comprehensive manner."

Noisemap 6.0 – The USAF Microcomputer Program for Airport Noise Analysis (Biodynamic Environment Branch, Harry G. Armstrong Aerospace Medical Research Laboratory, 1990) states, “Noisemap is a key factor in the Air Force defense against noise related lawsuits.” To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, the EA must provide substantive verification—which will include actual test results—that the current version of Noisemap is reliable.

Sincerely,



Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Re: Angel Thunder—Physical and Mental Health

Dear Ms. Devine,

The Angel Thunder EA fails to examine the impacts of aircraft operations on the physical and mental health of Tucson's residents.

It might be argued—successfully or unsuccessfully—that the EA's proposed action will only incrementally affect residents' physical and mental health. The EA fails even to make that argument.

The incremental impact of an action may not in itself be significant. However, the incremental impact, taken together with the incremental impacts of other actions, may create very substantial consequences to the environment. The sum of the incremental impacts may be significant.

This is why the AT EA is required to analyze the cumulative effects of *all* impacts, even though some incremental impacts may appear to be insignificant.  ¹

Cumulative impacts include the effects on residents' physical and mental health. The AT EA is required to carefully analyze both the incremental and the cumulative impacts of aircraft noise on physical and mental health.

A survey of the literature, which must be a part of the EA's analysis, reveals that aircraft noise can have a significant impact on physical and mental health.

For example, Hegge et al (2002) conducted a longitudinal study of children when the Munich (Germany) airport was moved from one location to another. *Monitor on Psychology* (July/August 2011) describes this study as "one of the most compelling studies in the field of noise pollution."

One of the leaders of the study, Gary W. Evans, PhD, concluded

This study is among the strongest, probably the most definitive proof that noise—even at levels that do not produce any hearing damage—causes stress and is harmful to humans. [Emphasis added.]

Monitor on Psychology summarizes some of the results of the study:

Munich students near the working airports had significantly higher levels of the stress hormones adrenaline and cortisol and markedly higher blood

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 2:57:53 PM
Comment addressed in revised Section 5. Section 5.1.1 discusses the review of cumulative impacts at the macro level. Table 5-1 displays a series of military actions that represent past, present, and future actions undertaken by the USAF within the region of influence at the macro level

pressure readings than children in quieter neighborhoods. Evidence suggests that elevated blood pressure in childhood predicts higher blood pressure later in life, and higher levels of stress hormones are linked to several life-threatening adult illnesses, including high blood pressure, elevated cholesterol and other lipids, and heart disease.

Monitor on Psychology also cites a report released in 2011 by the World Health Organization and the European Commission's Joint Research Centre. The report analyzed a number of epidemiological studies. *Monitor on Psychology* describes the report's findings:

A steady exposure to "noise pollution," the report concludes, may lead to higher blood pressure and fatal heart attacks. . . .

The report also confirmed what several psychologists have known for decades: Chronic noise impairs a child's development and may have a lifelong effect on educational attainment and overall health. Numerous studies now show that children exposed to households or classrooms near airplane flight paths, railways or highways are slower in their development of cognitive and language skills and have lower reading scores.

"There is overwhelming evidence that exposure to environmental noise has adverse effects on the health of the population," the report concludes, citing children as particularly vulnerable to the effects of chronic urban and suburban racket.

Monitor on Psychology notes that noise can impact not just physical health, but mental health as well. Quoting psychologist Arline Bronzaft, PhD, an environmental noise researcher and advisor to four New York City mayors on noise policy:

Noise is a psychological phenomenon. While the ear picks up the sound waves and sends it to the temporal lobe for interpretation, it's the higher senses of the brain that determine whether that sound is unwanted, unpleasant or disturbing, and that's why psychologists need to be heavily involved in this issue.

In a comprehensive publication titled *Community Noise* (edited by Berglund and Lindvall; 1995), the World Health Organization compiled the results of more than nine hundred separate studies of the effects of noise upon humans. *Community Noise* found that health effects include:

- Increase in blood pressure and vasoconstriction, which can lead to eventual hypertension and other cardiovascular disorders.
- Elevated levels of chemicals such as catecholamines, which cause cardiac arrhythmias, platelet aggregation, increased lipid metabolism, and damage to arterial linings.
- Higher risk of angina pectoris.

- Alteration of normal sleep patterns at night, which results in increased fatigue, changes in mood, and decreased performance during the day.
- Irritability, instability, argumentativeness, anxiety, nervousness, insomnia.
- Nausea, headache, loss of appetite, reduction in sexual drive.

Children are even more sensitive to the health effects of noise than adults are, according to the findings of *Community Noise*.

The Department of Defense agrees. DoD's *Operational Noise Manual* (2005) states on page 3-20 that noise can

lead to physiological changes in children . . . the three principal areas of impact are cardiovascular, cognitive, and personal control. Children chronically exposed to noise may suffer from increased cardiovascular activity and this increased activity may reflect direct sympathetic arousal and/or efforts to cope with the interfering effects of noise.

Monitor on Psychology states

New noise research in the United States has been scarce . . . since nearly 30 years ago federal funding for noise pollution research was cut after the U.S. Environmental Protection Agency's Office of Noise Abatement and Control was eliminated.

Because of this, researchers do not yet understand the full range of impacts of noise upon health. Absent a complete understanding, the Air Force has an obligation to take a conservative approach when deciding whether to jeopardize the mental and physical health of thousands of Tucson residents.

A conservative approach is especially warranted when the health of children may be impacted even more heavily than adults.

Without a careful evaluation of the relevant literature, and without a quantitative analysis of the impacts (including cumulative impacts) of aircraft noise on the physical and mental health of Tucson's residents, the Air Force cannot know whether the impacts are significant, and cannot conclude that a FONSI is justified.

To ensure the final decision regarding the AT EA will withstand legal challenges, the impacts on health must be properly analyzed.

Sincerely,


Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—Impacts on Students

Dear Ms. Devine,

The AT EA fails to examine the impacts of Angel Thunder operations on students.

The Air Force has an obligation under the National Environmental Policy Act to consider all potential impacts of its proposed action. Impacts on students are a major concern, but the EA ignores those impacts.

It might be argued—successfully or unsuccessfully—that the EA’s proposed action will only incrementally affect students. The EA fails even to make that argument.

The incremental impact of an action may not in itself be significant. However, the incremental impact, taken together with the incremental impacts of other actions, may create very substantial consequences to the environment. The sum of the incremental impacts may be significant.

This is why the AT EA is required to analyze the cumulative effects of *all* impacts, even though some incremental impacts may appear to be insignificant.

Cumulative impacts include the effects on students. The AT EA is required to carefully analyze both the incremental and the cumulative impacts of aircraft noise on students.

A survey of the literature, which must be a part of the EA’s analysis, reveals that aircraft noise can have a significant impact on students.

For example, Hegge et al (2002) conducted a longitudinal study of children when the Munich (Germany) airport was moved from one location to another. The July/August, 2011, issue of *Monitor on Psychology* describes this study as “one of the most compelling studies in the field of noise pollution.”

Monitor on Psychology summarizes the study:

Six months before and 12 and 18 months after the [Munich] airport closed and moved to a distant location, researchers . . . administered tests of reading, memory, attention and hearing to third- and fourth-graders who lived and attended school near the two airport sites. They found that the reading

comprehension skills and long-term memory of children near the old airport improved once air traffic moved to the new airport, while the performance of children near the new airport declined.

This study demonstrates an unequivocal link between aircraft noise and students' performance.

In the vicinity of the old airport, some skills remained depressed after the airport closed. For example, students' speech perception—their abilities to understand their teachers, classmates, parents, and others—did not improve. *Monitor on Psychology* describes this:

After the old airport closed . . . [the students'] speech perception remained impaired, says Evans, [one of the authors of the study and] a professor of human ecology at Cornell University.

“We think one thing that might be going on is that children who are exposed to noise develop a stress response of ignoring the noise, but not only do they ignore the noise, there's evidence they also ignore speech,” Evans says. “So not only are they ignoring the stimuli that are harmful, but they're also ignoring stimuli that they need to pay attention to.”

The students' poor academic performance will handicap them for the rest of their lives. For the students who will be impacted by the noise—and for a community that depends upon an educated workforce—the long-term effects will be unfortunate.

Does the Air Force not care about this?

The Department of Defense does care. DoD's *Operational Noise Manual* (2005) states:

There is some evidence that high levels of noise in classrooms can even lead to physiological changes in children. According to Evans (1993), the three principal areas of impact are cardiovascular, cognitive, and personal control. . . . In the short term, the children can cope, but in the long term, they have lower motivation, lower reading scores, and less patience for solving difficult problems.

DOD's *Operational Noise Manual* lists those students who are most susceptible to the impacts of noise:

- The youngest
- Those with English as a second language
- Any child suffering from a hearing deficiency (including short term hearing loss from middle ear infections)
- Children starting with below average academic skills
- Children with Attention Deficit Disorder (ADD)

The EA's Table 3-1 shows that a majority of residents in the vicinity of DMAFB are minorities. In Tucson, most minorities are Hispanic. For many of those, English is a second language. As noted directly above, *Operational Noise Manual* states that students with English as a second language are among those who are most susceptible to the impacts of noise.

In a comprehensive publication titled *Community Noise* (edited by Berglund and Lindvall, 1995), the World Health Organization compiled the results of more than nine hundred separate studies on the effects of noise upon humans. *Community Noise* determined that students affected by aircraft noise have greater difficulty learning to read. The affected students also have greater difficulty processing information.

The American National Standards Institute (ANSI) has established commonly recognized standards for classroom noise. When the noisiest hour in a classroom is dominated by sources such as aircraft, the limits for most classrooms are an hourly average sound level of 40 dBA, and the sound level must not exceed 40 dBA for more than 10 percent of the hour. [*Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools* (ANSI, 2002 & 2009)].

In *Using Supplemental Noise Metrics and Analysis Tools* (DoD, 2009) (hereinafter referred to as *Supplemental Metrics*), the Department of Defense prescribes the Leq (equivalent sound level) metric to identify schools that are potentially impacted by high-decibel aircraft noise. (Merely stating whether a school is within the DNL 65 dB contour is not sufficient.) *Supplemental Metrics* prescribes that all schools subjected to an eight-hour Leq of least 60 dBA outdoors be analyzed further.

For schools that warrant further analysis, *Supplemental Metrics* prescribes the metric of NA75 (Lmax) for outdoors noise. For an eight-hour school day, this yields the number of events in which outdoor noise exceeds 75 dBA (approximately equal to 50 dBA inside classrooms).

Supplemental Metrics also prescribes the metric of TA75 (Lmax) for outdoor noise. This yields the number of minutes in eight hours in which outdoor noise exceeds 75 dBA (approximately equal to 50 dBA inside classrooms).

To compare classroom decibel levels directly against the ANSI standards above, the use of TA65 (Lmax) is necessary.

Because the Angel Thunder EA is required to analyze cumulative effects, the combined noise impacts of all aircraft must be assessed with the noise metrics prescribed by *Supplemental Metrics*.

These metrics yield quantitative results, which are meaningful and revealing to the Air Force's decision-makers, and to residents of the affected community.

Without a careful evaluation of the relevant literature, and without a quantitative analysis of the impacts (including cumulative impacts) of aircraft noise on students, the Air Force cannot know whether the impacts are significant, and cannot conclude that a FONSI is justified.

To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, the impacts on health must be properly analyzed.

Sincerely,



Gary A. Hunter
Resident of Tucson

April 1, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—Property Values

Dear Ms. Devine,

Executive Order No. 13352, which was signed by President George W. Bush and which is appended to the National Environmental Policy Act, states that the Secretary of Defense shall “carry out the programs, projects, and activities of the [Department of Defense] . . . in a manner that . . . takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources.”

To comply with this Executive Order, the Angel Thunder EA must “take appropriate account” of the impacts of aircraft noise upon affected properties. The impacts include effects on property values.

The Angel Thunder EA makes no assessment of property values.

While expansion of the Angel Thunder mission might alter DNL contours only incrementally, the substantial increase of high-decibel flights above midtown Tucson during the two annual AT training periods each year will significantly affect the livability of midtown homes. As livability is affected, property values are affected.

Even if the expanded Angel Thunder mission affects property values only modestly, the effect must be analyzed in conjunction with the cumulative impacts of DM’s aircraft noise on property values. (Cumulative impacts are discussed in another letter regarding the Angel Thunder EA.)

In its analysis of property values, the AT EA must use accepted methods of property valuation. Further, it must incorporate the results of the many studies that directly correlate property values with aircraft noise.

The Federal Aviation Administration (FAA) states quite bluntly, “Studies have shown that aircraft noise does decrease the value of residential property located around airports” [*Aviation Noise Effects* (FAA, 1985)].

FAA has carefully compiled its *Aviation Noise Effects* which, in its own words, “has been developed after reviewing the rather extensive literature in each topical area, including

many original research papers, and also by taking advantage of literature searches and reviews carried out under FAA and other Federal funding over the past two decades.”

Aviation Noise Effects summarizes nine studies of residential property values in the vicinities of major airports in the United States and Canada. Without exception, the studies demonstrate that aircraft noise decreases property values.

Across the nine studies, property values decrease between 0.6% per DNL decibel and 2.3% per DNL decibel.

A very comprehensive review of property-value studies is *Meta-Analysis of Airport Noise and Hedonic Property Values* (Nelson, 2004), hereinafter referred to as *Meta-Analysis*.

In *Meta-Analysis*, author Nelson used a widely accepted statistical procedure to assess twenty studies that encompassed 33 reviews of residential property values at 23 airports in the United States and Canada.

Every one of the studies confirms that aircraft noise decreases property values. Decreases range from a low of 0.29% per DNL decibel to a high of 1.49% per DNL decibel. For all studies, the mean (average) decrease is 0.75% per DNL decibel.

The methodology and findings of *Meta-Analysis* and of the FAA’s *Aviation Noise Effects* are undeniable.

Without a careful quantitative analysis of the impacts (including cumulative impacts) of aircraft noise on the ROI’s property values, the Air Force cannot know whether the impacts are significant, and cannot conclude that a FONSI is justified.

To ensure the final decision regarding the Angel Thunder EA will withstand legal challenges, property values must be properly analyzed.

Sincerely,


Gary A. Hunter
Resident of Tucson

April 2, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—EA

Dear Ms. Devine,

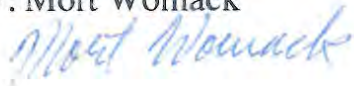
I have lived in Tucson for over 50 years and have been effected day after day by the noise of the DM planes flying over the heart of the city--it is absurd to claim that increasing flights though Angel Thunder will have no significant impact on our community. Fifty years ago as a graduate student at the U of A, my classes were often interrupted because we couldn't hear the professor's lecture over the noise of the planes flying overhead. About forty years ago a DM plane crashed next to Mansfeld school and incinerated two women in their car. The crash was a block or two from the university campus and next to a large middle school--hundreds of people could have been killed. The Air Force acknowledged how inappropriate their flights were over a large metropolitan area and said they would stop flying over the city, so I bought a house about a mile NE of the U of A.

Fast forward 40 years and that has not happened. Instead there are more planes flying over my house and every year they are louder

than ever. I am retired and would like to be out in my yard, but instead have to hide from the noise of the jets by staying in my house. I have invested 40 years of sweat and money in my yard, but I can't enjoy it. Even in the house with dual pane windows the noise is often overwhelming, even with my poor hearing. It is ridiculous to maintain that Angel Thunder will have no impact on my life. This 50% increase in flights for even two weeks is not acceptable. Come sit in my backyard and experience it yourself or better yet go to a home miles closer to the base and get the full effect!

Sincerely,

W. Mort Womack



April 2, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Re: Angel Thunder Environmental Assessment

Dear Ms. Devine:

Along with many residents near Davis Monthan Air Base, I have noticed the terrible increase of noise. When I moved into my home in 2001, the noise was nothing like it is today. There are many more planes using the base and louder aircraft.

I have not seen data about structural damage to homes that are close to the base, but I have witnessed it. I was in a home last month on 33rd Street, in the Julia Keene neighborhood, across the street from the Base and the owner showed me a new ceiling crack at the entryway from vibration. I had been in the house a few months ago, and didn't see it then. Since the houses around her are about the same age and probably of the same construction material, I can assume that her experience is not an isolated one. She said the vibrations from the F16s, F18s, F22s and then the worst, the F35 are awful. So, when a home owner has a house in this neighborhood, I can assume it would not be sellable. Some unsympathetic people have suggested that my friend "just move". How could she sell her home? Sound remediation doesn't help damage from vibration. She wonders when and if she will experience a ceiling collapse or worse.

To continue training in larger, noisier aircraft at Davis Monthan Air Base within the City limits is a burden on the surrounding neighborhoods. Julia Keene Neighborhood had to close its school because of the Base; the Air Force should have had the neighborhood condemned and the home owners reimbursed.

I believe there has been a significant impact for Tucson neighborhoods. Your findings are fiction.

Sincerely,



Anita W. Scales

2734 East Malvern St.
Tucson, AZ 85716

April 2, 2017

AFCEC/CZN

Attn: ACC NEPA PM

Ms. Robin Devine

2261 Hughes Avenue, Suite 155

JBSA Lackland TX 78236

Re: Angel Thunder—EA

Dear Ms. Devine,

It is a wonderful spring day in Tucson or it would be, if I hadn't been driven inside by the noisy jets from DM. Every year they get louder and louder and there are more flights going overhead. I was out talking to my neighbor and showing her my iris garden when a wave of 3 jets came overhead. We couldn't talk and it was too painful to sit outside, so once again I was driven into the house. I don't even live that close to DM, but it is still impossible to live a normal life with all these jets flying right over the city. I have had dual pane windows installed in most of the house and that helps a little, but not enough to truly mitigate the noise of the jets. I can't believe the Air Force is considering bringing even noisier planes to Tucson. I am a retired teacher and did my student

teaching in central Tucson, but when I actually started teaching, I looked at schools as far away as possible from central Tucson--it was just too hard to teach in the noisy atmosphere the jets made. It meant I had to drive an extra 8 miles each way, but it was worth it.

We may be in the Sonoran Desert, but Tucson isn't some sleepy, dusty Western ghost town--it is a modern community with a million or so people in Greater Tucson. The Air Force needs to stop acting like Tucson is Yucca Flats or some Western movie set--if they don't stop flying over central Tucson, someday they will kill lots of people. My friend remembers that a plane once crashed into a grocery store over at 22nd Street and Alvernon, and if hadn't been late at night and the store was virtually empty, many people would have been killed or injured. That was decades ago, but nothing has really changed--you still are not doing any meaningful environmental or safety impact studies. I want you to see that Air Force actually does a meaningful assessment of the impacts the Angel Thunder program would bring to Tucson and for that matter you should look at whether Tucson is the right place for such heavy plane traffic period.

Thank you,
Linda Phelan



Law Offices of
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Kathleen G. Williamson, J.D., Ph.D., LL.M. *Licensed in New York and Arizona*

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April 2, 2017
AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

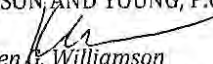
RE: ANGEL THUNDER – TUCSON DAVIS MONTHAN AFB

This community does not support any increases in jet frequency, expansion of flight activity, or increases in decibels. We object to the so-called "Angel" Thunder; in fact, as a Christian, I find it offensive that the AF calls a killer machine an angel. "Thunder" is accurate, however, and we are SICK of our valley being destroyed by the constant thundering sounds of F-whatever jets and helicopters that are screaming, circling, and training above our urban density.

I have difficulty in my law office often times hearing what people are saying whether in person or on the phone when the jets are roaring overhead. The helicopters that fly over my zenith actually rattle my house, doors, and windows. When I am outside trying to enjoy our beautiful desert skies and environment, there is more often than not, some jet or jets flying in the sky. Often there are several flying in formation or following each other while circling tightly over my zenith in the downtown area. And more often than not, they are terrifyingly loud. The sound thunders and screams and reverberates for minutes for each jet. This past winter and current spring, there has been even more increase of this assault. It's horrible. And our complaints are ignored. Furthermore, we'd have to complain twenty times a day and can't afford that much time. It's bad enough the jets were so disruptive much less spend time making constant phone calls each time we are assaulted!

It is insane and insane that such activities are happening on such an ongoing and constant basis over a metropolitan area. It is dangerous, reckless, and polluting our environment in every way. The studies show that even benign commercial traffic overhead is damaging to health; how much more the afterburners and killer decibels of these fighter jets.
NO MORE MILITARY FLIGHT TRAINING OVER TUCSON. NO ANGEL THUNDER.

Kindest regards,
WILLIAMSON AND YOUNG, P.C.


/s/Kathleen G. Williamson
Kathleen G. Williamson, Esq.

AFCEC/CZN

Attention: ACC NEPA DM, Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine,

April 3, 2017

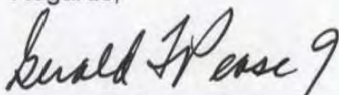
I recently reviewed the Draft Environmental Assessment Addressing the Angel Thunder Personnel Recovery/Rescue Training Exercise in the Southwestern United States. I wanted to let you know that I was quite impressed with the comprehensive nature of the assessment. As the former Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health, the former Air Force Deputy Director of Operations and the former Air Force Director of Air Operations, I can assure you that this assessment is one of the most comprehensive I have reviewed in my 20 years of experience. I especially appreciated the sections on consultations with the tribes and environmental justice. I think that subsequent environmental assessments will be able to take advantage of the scholarship found in this particular EA to streamline their analysis.

However, one area that puzzled me was the section on socio-economics. The passage reads in part that the "AT exercise activities under the Proposed Action would not occur in one place long enough to influence local socioeconomics.... [AT] would be self-contained and supplied by the USAF. Personnel would not be expected to spend locally as a result." Having been deployed to Davis-Monthan AFB (DM) during my flying career for various exercises, I always had the time to go off base and at least partake of the local cuisine. I suspect local business organizations such as the Tourist Board and the Chamber of Commerce could give you some factual information/analysis on the economic benefits to the Tucson economy resulting from deployments to DM. 

Additionally, as a former operator and someone who has personally participated in a wartime search and rescue operation, I cannot over-emphasize the importance of routine practice of this very challenging mission. Based on the current focus of US military operations, no place could be better than the desert southwest for the Angel Thunder Exercise.

I have been retired from the Air Force and living in Tucson for the past three years. During that time, I have been very pleasantly surprised by the overwhelming support for DM that I hear from ordinary people that I deal with on a daily basis, whether it is buying tools at Home Depot to visiting the area's National Park and National Monuments. Although you (like I when I was in the Pentagon) will hear complaints from a very few activists in our city, I can assure you that the vast majority of Tucsonans are extremely supportive and proud of the base, its airmen and its missions.

Regards,



Gerald F. (Fred) Pease Jr.
6222 N. Calle Del Halcon
Tucson, AZ 85718

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 3:05:40 PM

Comment addressed in Section 3.0 under "Socioeconomics." It was clarified that if local spending were to occur, it would be widely dispersed and would not result in an appreciable increase to any specific local economy.

*GUST
ROSENFELD*
ATTORNEYS SINCE 1921 P.L.C.

■ ONE S. CHURCH AVE., SUITE 1900 ■ TUCSON, ARIZONA 85701-1627 ■ TELEPHONE 520-628-7070 ■ FACSIMILE 520-624-3849 ■

Thomas M. Murphy
520-205-4759
tmurphy@gustlaw.com

April 3, 2017

AFCEC/CZN
Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine:

I am a lifetime citizen of Tucson, Arizona, and I am giving my full support to the continuation of the Angel Thunder Exercise continuing in the southwest. The training that takes place at Angel Thunder benefits the Air Force in preparing its airmen for conditions similar to those areas where the Air Force is currently engaged. In addition it helps the local rescue agencies that benefit from its training.

Access to the excellent Arizona weather, the air space and the Barry Goldwater Range makes Davis Monthan the perfect host for the Angel Thunder. Our cities and county governments strongly support the Air Force, as do the residents of the greater Tucson area. A current survey shows that 92% of the residents support the Air Force's presence in Southern Arizona.

I support this mission 100%.

Very truly yours,


Thomas M. Murphy
For the Firm

TMM/sml

856950

WWW.GUSTLAW.COM
TUCSON - WICKENBURG - PHOENIX

April 3, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236 Re: Mission Thunder

Dear Ms. Devine:

As a resident and business owner in central Tucson I, and my bed and breakfast guests have been subjected to ever increasing noise levels from Davis Monthan aircraft. I know from personal experience, that the neighborhoods have been trying for decades to convince the Air Force to look into the excessive noise and make some sort of mitigating adjustments.

What started out as training for pilots from winter climates has morphed into a year round barrage of training, day and night, every season of the year. The aircraft have grown larger, louder and more numerous over the years. Our most recent campaign has been to convince the powers that be, that the F-35 is totally unsuitable to be based here. Although Tucson was passed over initially, the F-35's from Luke Airforce Base regularly fly over our city of 1,000,000 people and we know that the possibility of permanent basing still hangs in the air.

Our objection is to the noise, and to the danger posed by a single pilot plane, who when experiencing trouble, has nowhere to go except to drop his jet on top of a heavily populated area.

We believe that the Air Force is operating with an out of date EA and over the years increased its training missions and sorties and still asserting that there was no significant impact. Well there certainly is! The noise is sometimes unbearable and frightening. I know you have received other mail from experts attesting to the actual noise levels.

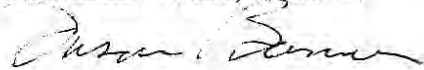
I ask you to please require the Air Force to submit to a legal environmental assessment and to deny the predicted increase of traffic & noise that would accompany the Angel Thunder plan.

Their assessment of noise levels seems to be based on a computer model and is hopelessly faulty. The Air Force has refused to consider the hundreds of complaints or the proof offered them and continues to turn a deaf ear to our protests. Look at what's happening in Vermont and Whidbey Island. We do not want this to be our future. There is empty desert land around us; there are other more appropriate places to train and test aircraft without destroying the lives and living environments of long established communities.

Please. Do something.

Sincerely,

Susan Banner - Tucson, AZ resident



AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

Elisabeth McFarlane
3231 E. Lester St
Tucson, AZ 85716

To Whom it may concern:

I very strongly disagree with the recent finding of no significant impact for the Angel Thunder Environmental Assessment (EA). As a house owner in the affected area (I own 2646 E. 20th St), though the house is closer to the University of Arizona than the Base, my house was put in a zone considered unlivable both in terms of noise and safety. I was not alone. Many neighbors in my area have fought more and louder flights vociferously over the years. Aircraft can be way too loud, especially when they happen to fly low and directly overhead. The noise can be deafening, to the point of harming people. I have read some of the health effects caused by such excessive noise, including cancer and even mental issues. I personally have contracted cancer at a young age and I have literally been driven crazy by the noise. In addition, cumulative impact on people is an important part of an EA. However, the EA strangely fails to take into account transient aircraft, or recent F-35 flyovers, both of which are excessively loud for an urban environment. Helicopters can also be exceedingly loud. I have heard that there is a lobbying effort afoot on the part of business interests to push for more air activity over our neighborhood. Please take into account the very real dangers and threats to people who are just trying to live in our homes. It is a sad state that business interests can push to make our homes unlivable, all while offering no compensation to us. To summarize, I disagree with the recent finding of no significant impact. That has not been my experience to put it mildly, and it seems like a travesty of justice to allow a finding of no significant impact to stand. I hope that you will reconsider.



Sincerely,

4/3/17

Elisabeth McFarlane

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 3:09:28 PM

Comment addressed in Section 5.1.1, Table 5-1. Under "Luke AFB," the beddown of up to 144 F-35A aircraft at Luke AFB is discussed. The total transient aircraft included in Appendix E, Table E 1 is based on the 2008 AICUZ data converted to average daily operations. This is the best available information at this time, and has been carried forward as a comparative baseline to determine the effects under NEPA.

April 3, 2017

AFCEC/CZN
Attn: ACC NEPA PM
Ms. Robin Devine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Dear M. Devine:

I have attempted to review the EA for Angel Thunder, but as usual these things are poorly publicized in our community and I have had to rush to get a response to you in time.

I am writing to oppose approval of the EA and this military exercise. As is usual with the Air Force, much information is left out of these assessments. No wonder there is a current lawsuit and residents of Tucson are growing so concerned over military aircraft noise.

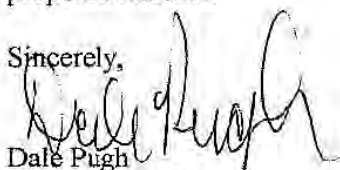
As noted in the EA, this will add approximately 600 more sorties to Davis Monthan Air Force Base. The EA fails to address the current conflict between commercial and military aircraft over the skies of Tucson. This is a major safety issue the military continues to ignore.

All the noise contour maps are focused around the immediate vicinity of Davis Monthan. None that I could find follow the paths of aircraft as they pass over our community, homes and schools. The noise and safety impact of flights beyond Davis Monthan continues to be ignored and is a major issue as military flights invade every corner of our community and the noise they produce is invasive.

The report notes that aircraft will be flying as low as 3,000 feet. This is completely invasive as these aircraft travel over residential areas. The military has little regard or concern for the negative impact it is having on the lives of the residents of Tucson.

The skies of Tucson are crowded, growing unsafe and the noise from military aircraft is getting intolerable. This assessment does nothing to address those issues and I oppose the EA and the proposed mission.

Sincerely,


Dale Pugh
5140 N. Via Condesa
Tucson, AZ 85718

Number: 1 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 3:19:01 PM

Comment addressed in Section 3.3.1, paragraph 1. This paragraph discusses how special use airspace, which would be used under the Proposed Action where possible, separates military and civilian aircraft so that training operations can be conducted safely. Additionally, adherence to Federal Aviation Regulations and/or Visual Flight Rules would allow both military and civilian aircraft to operate in shared airspace safely.

Number: 2 Author: MSHELBY Subject: Sticky Note Date: 4/25/2017 3:17:54 PM

Please see Section 3.1.2.1, paragraph 4, which states that the data used for the noise analysis is the best available information at this time and has been carried forward as a comparative baseline to determine the effects of future actions under NEPA.

Jean-Paul Bierny, M.D.

April 3, 2017

AFCEC/CZN
attn: ACC NEPA PM
Ms Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland TX 78236

Re: Angel Thunder negative impact on community in Tucson, AZ

Dear Ms Divine,

I have lived in Tucson since 1,971. This is the first time that I am driven to object to a DMAFB project. But the intolerable amount of noise it would cause, and other features of this plan, drive me to it. The A-10 never bothered me or my family.

The Angel Thunder mission would increase military flights over Tucson midtown by 50% for 2 weeks at a time, twice a year. And in the future ??

The recent 2012 EA of the Angel Thunder (AT) mission, to be based at Davis Monthan Air Force Basis (DMAFB) ended in a FONSI.

I strongly object to it: it is fraught with errors and omissions. It should be followed by a thorough Environmental Impact Study (EIS) instead of rushing into a situation that well might affect Tucson negatively and severely for a very long time.

1) Evaluation of the **NOISE** that will result from it: the evaluation was based on the fundamentally misleading premises of using DNL analysis, averaging that noise over 24 hours. This is meaningless in the evaluation of military aircraft overflights' impact on people, who are subjected to single events, and results in misleadingly much lower noise figures. It gives the population a false sense of comfort. And clearly the new types of aircraft envisaged (F 11, F 15, F 22 and F 35) are considerably louder than the A 10 (which few people objected to, including myself). This extremely high level

of noise would have a marked adverse impact on a large swath of the central city, including many of Tucson's historic midtown neighborhoods, undermining both Tucson's heritage, and its potential as a future center for high-tech industries. And it would spread quite beyond the midtown area. The use of DNL for this purpose has been discredited by the DoD itself. It is recommending instead the use of SEL (Sound Exposure Level) which focuses on individual overflights as experienced as a real and uncomfortable annoyance by people on the ground. Being based on a realistic situation, it is a much better, and more honest way for the USAF to communicate with the public, which would benefit all. That is obviously how it should be done. It should be done as part of impartial, fair study of overflying aircraft noise under realistic conditions. And it would avoid potential and strongly based legal challenges, which we all want to avoid.

2) **Safety:** F-35 are unproven, single engine airplane. They would carry live ordnance between TIA and DM. Not the safest situation...

3) **Education:** the noise produced by these very loud planes would interfere with teaching and learning, including at the UA. Which parents would knowingly want to send their youngsters to study in a University where classes will be interrupted by excessive aircraft noise?

4) **Tourism:** It would be damaging to Tucson's important tourism industry. Among others, it would be a disaster for the historical and gorgeous Arizona Inn. Indeed, which visitors would want to stay there and be subjected to the frequent and incredibly loud sound of this kind of military aircraft while relaxing, hiking, golfing, playing tennis, etc?

5) **Livability, Property values, Retirement:** Livability and thus property values will be reduced. Attractiveness to retirees would plummet.

6) **Cumulative health impacts:** it is known that repeated exposure to very noise results in negative cumulative health consequences, starting in childhood. Stress, learning difficulties (particularly in children whose English is a second language), decreased patience, and leading to training problems for Tucson's future manpower, cardiac problems, hypertension.

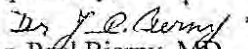
7) The overall decrease in livability, with all of the above aspects could lead to a decreased population, and **serious problems from the Tucson BUDGET.**

USAF planners, City/County planners, and the Tucson business community (including the groups called "MCRC" and "Mission Strong") should take that in very serious consideration, instead of accepting blindly ANY plans to bring any new aircraft to Tucson, irrespective of its negative impact on our community. Our city is generally supportive of DMAFB, but probably not at the cost of the destruction of our quality of life.

I respectfully urge you to study the issue, focusing on alternative new missions for DMAFB compatible with normal life in an immediately adjacent community of 1,000,000 people.

If this decision is made unilaterally without giving to the Tucson community a live example of the amount of noise to expect, it could be perceived as irresponsible, un-democratic, and might result in negative popular political reactions against all parties involved, which we would normally support: the USAF, and our political representatives. This would be really unfortunate, as it is indeed avoidable.

Respectfully,


Jean-Paul Bierny, MD.

Chris Tanz, Ph.D.

April 3, 2017

AFCEC/CZN
attn: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236

Re: Angel Thunder's negative impact on the community in Tucson, AZ

Dear Ms. Divine,

Under the National Environmental Policy Act the Air Force is obligated to consider all potential impacts of its proposed actions.

Included among potential impacts on the city of Tucson as identified by NEPA are:

- Impacts on physical and mental health of residents
- Impacts on students
- Impacts on property values

All of these potential impacts were ignored in the Environmental Assessment of Angel Thunder, despite the fact that the base is situated within a metropolitan area of 1 million people and is immediately surrounded by residential areas. This list also omits impacts on the wider economy, such as detrimental effects on the city's attractiveness as a tourist destination, and as a retirement destination.

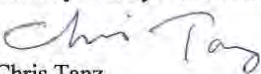
Furthermore, the analysis of noise impacts is based on discredited methodologies.

- It averages the noise of a day's overflights across 24 hours (DNL - day-night average sound level)
- It averages the noise of the Angel Thunder exercise (currently planned as two two-week periods over the year) across 365 days of the year.

At best this approach to measuring noise impacts is misleading. At worst it is deceptive. You don't have to have a Ph.D. in psychology to know that these kinds of measurements have nothing to do with how people experience noise. (I happen to have a Ph.D. in Psychology, but any thoughtful person can see that this type of measurement minimizes and distorts the impact of sudden extremely loud noise on people's health and peace of mind, etc.)

Therefore I would strongly urge you to require a thorough Environmental Impact Study (EIS) before proceeding with approvals for Angel Thunder.

Thank you for your attention,


Chris Tanz

Monday, April 3, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

RE: Angel Thunder at DMAFB

This letter is to express my OBJECTION^{^c} to Angel Thunder operations at Davis-Monthan AFB in Tucson, Arizona.

Here is why I object:

1. It is absurd that the Air Force gets to rule a "Finding of No Significant Impact" for their operations at DMAFB. This is the fox guarding the chickens. Tucsonans have been complaining for years about the noise and risk. The Air Force has been ignoring those complaints and listening instead to business and political interests in the area.
2. The Air Force and its lobbyists have created a system that ensures minimum complaints are filed: If people call about the noise and nothing changes, they stop calling. Those who continue calling are written off as "cranks" and ignored.
3. The Air Force has options. There is no reason to fly these aircraft over the homes, schools, businesses, and hospitals serving 750,000 people. The risk, lowered quality of life, and the damage to our \$2.6 Billion dollar a year tourism is too great. No sane person would do so, and no other enterprises do so either. None.
4. It is not true that the flights only damage a small area of the city and can be "remediated". We live 13 miles north of DMAFB and planes often fly very loud near or over our home. They fly over most of the area containing our major resorts, over college dorms housing thousands of students, over our downtown, the three major hospitals, and tens of thousands of homes.

5. It is not true that the flights only have a small noise impact; they can be heard in all quarters of the city at various time, including the college and concert venues. YOU ACKNOWLEDGE THIS PROBLEM BY CALLING IT "ANGEL **THUNDER**" The helicopters make a thumping noise that can be heard long before they can be seen, even when they are flying higher. Their noise just adds to the noise of commercial and Air National Guard flights from TIA.

When one of the AF aircraft crashes here, as they have and will again, and citizens are harmed, as they have been before, there will plenty of us willing to come forward and witness that we have warned the AF, again and again, that this would happen. Don't take actions that will expose the citizens and the AF to that scenario.

Sincerely,



James Collins



**Southern Arizona
Home Builders
Association**

2840 N. Country Club Road
Tucson, Arizona 85716
Phone: (520) 795-5114
Fax: (520) 326-8665
Web: www.sahba.org

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David M. Godlewski

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Brent Davis
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TRS Custom Builders

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Amy McReynolds
KB Home

Affiliated With



April 3, 2017

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

To whom it may concern:

The Southern Arizona Home Builders Association (SAHBA) representing over 360 business members throughout Southern Arizona, writes in support of the Angel Thunder training program at Davis Monthan Air Force Base.

The recent Angel Thunder Environmental Assessment concluded that the new training program would "not result in significant impacts on the quality of the human or natural environment". In addition, Davis-Monthan's economic impact in our local community exceeds \$1 billion annually. Adding the Angel Thunder program only enhances DM's economic contribution to our local community. Therefore, we offer our unequivocal support for the Angel Thunder program.

A majority of Tucsonans support Davis-Monthan AFB and the base benefits from a collaborative relationship with our local governments. Tucson and Davis-Monthan provide the ideal location for the Angel Thunder program due to Tucson's weather, range and airspace. The weather in Tucson is optimal for year-around training. Tucson's proximity to the Goldwater Range, one of the finest ranges in the nation, makes it ideal for a training program such as Angel Thunder. In addition to our ideal weather and location, Tucson also has unrestricted air space making it perfect for varied and numerous training scenarios.

In closing, we support this environmental assessment and Angel Thunder because Tucson is the ideal location for such a program which benefits both the Air Force and our country.

Sincerely,

David Godlewski
President



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P: (520) 296-0200 • F: (520) 296-1571
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April 3, 2017

Mr. Robin Divine
AFCEC/CZN,
Attention ACC NEPA PM
2261 Hughes Avenue, Suite 155
JBSA Lackland, TX 78236-9853

RE: AFCEC/CZN, Attention ACC NEPA PM
Angel Thunder

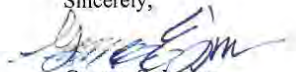
Dear Ms. Divine,

I am a 45 year resident of Tucson. All my adult life, the Davis Monthan AFB has been an important part of our civic structure. It is supported by about 90% of Tucson residents.

I am an Honorary Squadron Commander for the 755th Aircraft Maintenance Squadron. I volunteer because I believe in the mission and the airman of DMAFB.

Tucson would be an excellent site for the Angel Thunder Joint National Training Capability program. Great flying weather, varied terrain, and a welcoming military and civilian environment. Thank you for your consideration.

Sincerely,



George C. Larsen

MORALES
424 S VIA DE LOS CAMPOS
TUCSON, AZ 85711

April 3, 2017

Ms. Robin Divine, ACC NEPA PM
AFCEC/CZN
2261 Hughes Ave., Suite 155
JBSA Lackland, TX 78236-9853

Dear Ms. Divine,

My husband and I have lived under the flight path of Davis Monthan AFB for the past 22 years, and our current residence is less than 1.5 miles from the base.

I fully support the Angel Thunder mission. Training to protect the lives of our military personnel is obviously crucial, and I'm proud that our community can host such an important mission. And, on more than one occasion, trained forces from DMAFB have sprung into action during local crisis situations, directly benefitting the citizens of southern Arizona.

Although the noise of aircraft does not bother me or my family, this operation will have very little noise impact on the community. DM's location near Goldwater range, which has terrain and weather similar to conditions airmen would encounter in the Middle East, makes it ideal for this type of training. And our dry, sunny climate ensures that flying conditions will not interfere with or delay training.

Again, please consider this my full support of Angel Thunder.

Sincerely,



Linda S. Morales

AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JBSA Lackland, Texas 78236-9853

To Whom It May Concern:

As a resident in Pima County that works in downtown Tucson, I highly support the Angel Thunder mission for DMAFB. This mission would be a great complement to the many active, organized efforts our local jurisdictions have working together, and working with DMAFB. We excel as a community that has protocols in place for interjurisdictional communications and actions. I strongly believe that our community is ready to support a mission of this type. While we will support any and all flying missions, this one is particularly perfect for DMAFB due to the bases relationships and activities throughout the community.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Amber Smith', with a long, sweeping horizontal line extending to the right.

Amber Smith
1651 W. Limewood Dr.
Tucson, AZ 85755

AFCEC/CZN

Ms. Robin Divine

2261 Hughes Avenue Suite 155

JBSA Lackland, Texas

78236-9853

Re; Angel Thunder

Dear Ms Divine

My name is OK Rihl, I reside at 4160 E. Whittier, Tucson, AZ. I strongly support DM Air Force Base and the upcoming Angel Thunder exercise. I have two brother in laws that flew F-16 in the Air Force, one of them in combat and I understand the importance of Angel Thunder.

Thank You,

A handwritten signature in black ink, appearing to read 'OK Rihl', with a stylized, cursive flourish.

OK Rihl

**AFCEC/CZN, Attention: ACC NEPA PM
Ms. Robin Divine
2261 Hughes Avenue Suite 155
JB SA Lackland, Texas 78236-9853**

Letter of support for Angel Thunder Environmental Assessment (EA)

I am in support of the Angel Thunder environmental Assessment because the Tucson weather provides for year-around training capabilities, with no natural disasters.

Carrie Gilchrist

1611 W Limewood Dr
Oro Valley, AZ 85755

A handwritten signature in cursive script that reads "Carrie Gilchrist". The signature is written in black ink and is positioned to the right of the printed name "Carrie Gilchrist".



B

Angel Thunder Participant
Table

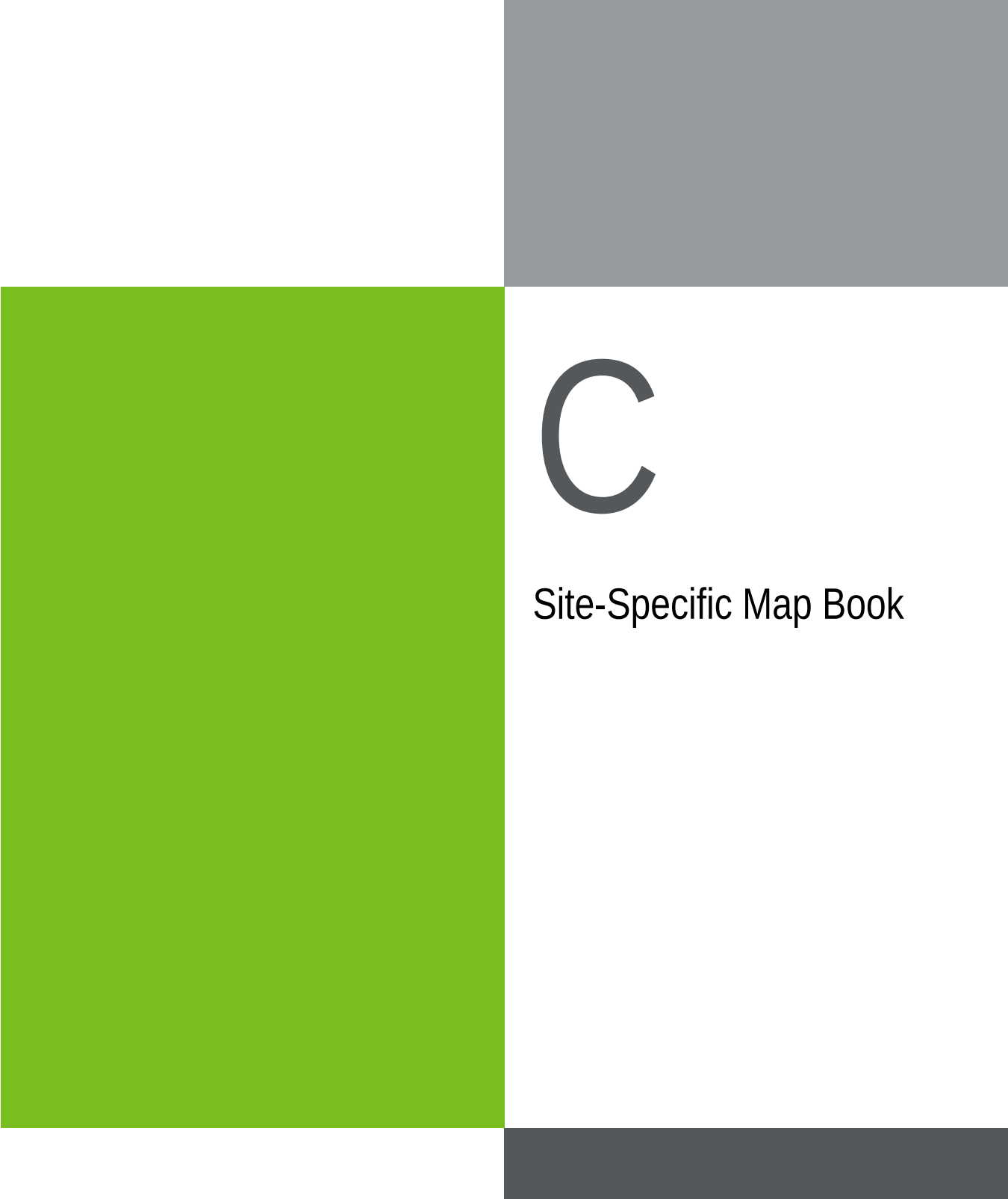
Appendix B: Angel Thunder Participant Table

Participating Organization and Aircraft Used	Proposed Number of Participants
EXAMPLE USAF UNITS	
9th Reconnaissance Squadron (RS) – MC-12	25
38th Rescue Squadron (RQS) – N/A Guardian Angel Personnel only (GA)	50
41st Electronic Combat Squadron (ECS) – C-130	50
41 RQS – HH-60G	100
48 RQS – N/A GA	100
55 RQS – HH-60G	100
58 RQS – N/A (GA)	50
66 RQS – HH-60G	100
71 RQS – HC-103J	100
79 RQS – HC-130J	100
101 RQS – HC-130J	30
102 RQS – HH-60	40
103 RQS – N/A GA	30
107th Fighter Squadron (FS) – A-10	50
161st Air Refueling Wing (ARW) – KC-135	50
347th Operations Support Squadron (OSS) – N/A*	30
563 OSS – N/A*	100
563rd Rescue Group (RQG) – N/A*	25
612th Air Operations Center (AOC) – N/A*	75
723rd Aircraft Maintenance Squadron (AMXS) – N/A*	50
823 AMXS – N/A*	30
923 AMXS – N/A*	100
Survival, Evasion, Resistance and Escape (SERE) – N/A*	50
EXAMPLE JOINT SERVICES	
Special Forces Group – N/A*	200
Force Reconnaissance – N/A*	200
Radio Battalion– N/A*	15
Army Aviation – CH-47, UH-60, AH-64, UH-72, C-12	300
Coast Guard – HH-60, C-130*	100
Navy – HH-60, C-130, CV-22, AH-1, F/A-18*	350
EXAMPLE LOCAL, STATE, and DOD INTERAGENCIES	
Department of State – N/A*	10
Drug Enforcement Agency – Bell 412, Cesena Citation	10
Customs and Border Patrol – UH-60, Cesena Citation	10
Federal Bureau of Investigation – Bell C-12	10
U.S. Marshal Service – King Air C-12	5
National Reconnaissance Office – N/A Ground personnel only	5

Participating Organization and Aircraft Used	Proposed Number of Participants
EXAMPLE LOCAL, STATE, and DOD INTERAGENCIES (continued)	
U.S. Forest Service – N/A Ground personnel only	10
U.S. National Park Service – MD-900	50
Civil Air Patrol – Cesena 182	125
University of Arizona Medical Center/Scottsdale Osborne Hospital – N/A*	200
University of Arizona, Arizona State University, Northern Arizona University – N/A *	200
Pima, Apache, Greenlee, Catron, Coconino, Maricopa, Navajo County Sheriff's Offices – N/A *	100
Mountain Rescue Search and Rescue – N/A	30
EXAMPLE COALITION PARTNERS**	
Australia – C-130	50
Brazil – C-130	50
Chile – C-130	50
Colombia – C-130	100
Denmark – C-130	25
European Air Group – N/A*	5
France – Super Puma, C-130	80
Germany – NH-53	15
India – N/A*	15
Ireland – N/A*	5
Italy – C-130	10
Japan – N/A*	10
Kazakhstan – N/A*	5
Netherlands – CH-47, AH-64, C-130	50
New Zealand – N/A*	10
Pakistan – N/A*	10
Singapore – CH-47	50
Switzerland – N/A*	5
Turkey – N/A*	5
United Kingdom – HC-47, C-130, Super Puma	50
EXAMPLE CONTRACTED AGENCIES	
Opposition Forces	100

*Ground personnel only

**Maximum of five Coalition Partners with aircraft per exercise



C

Site-Specific Map Book

Appendix C: Site-Specific Map Book

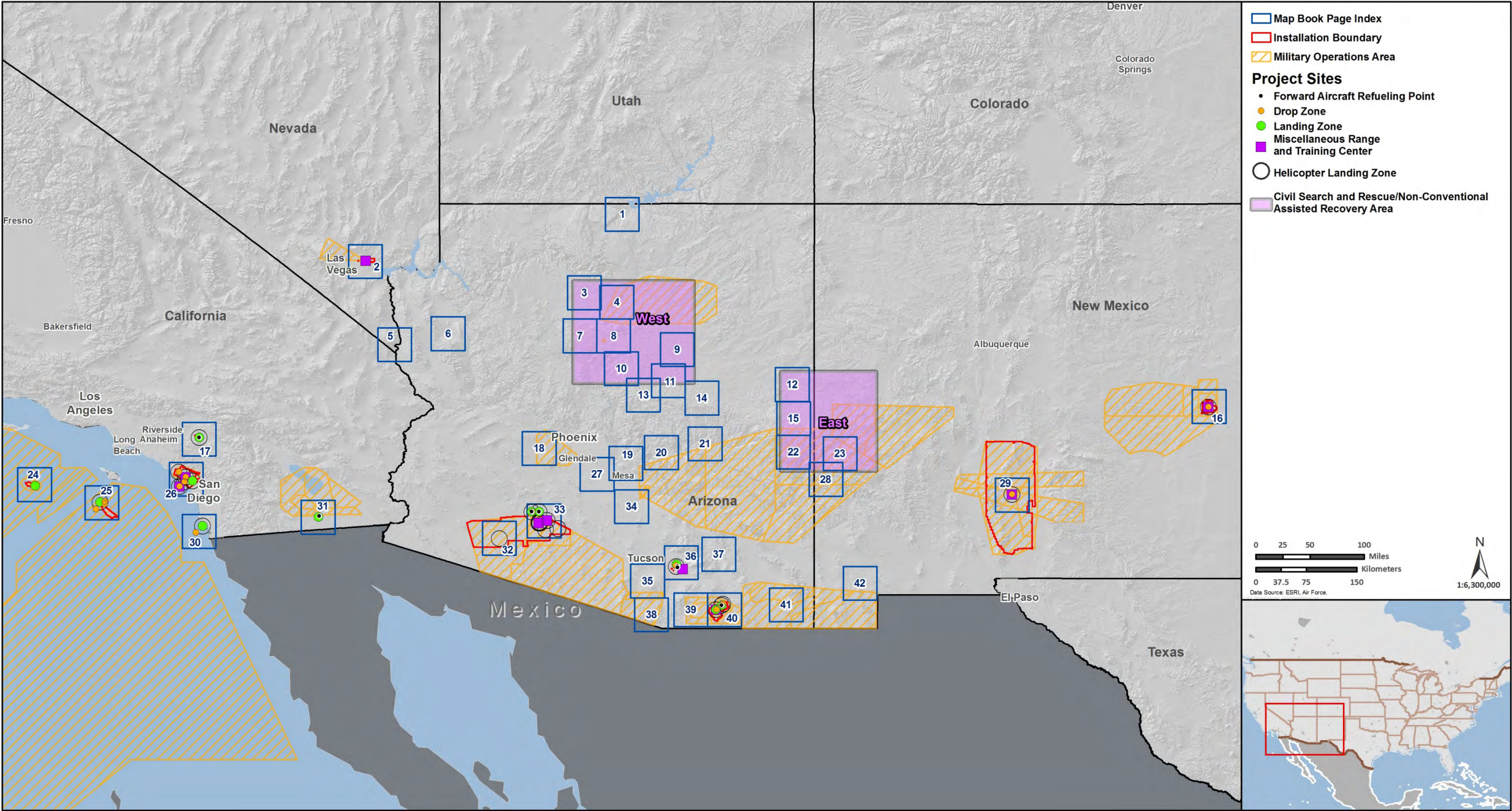


Figure C-1. Proposed Action Overview Map for Military Installations

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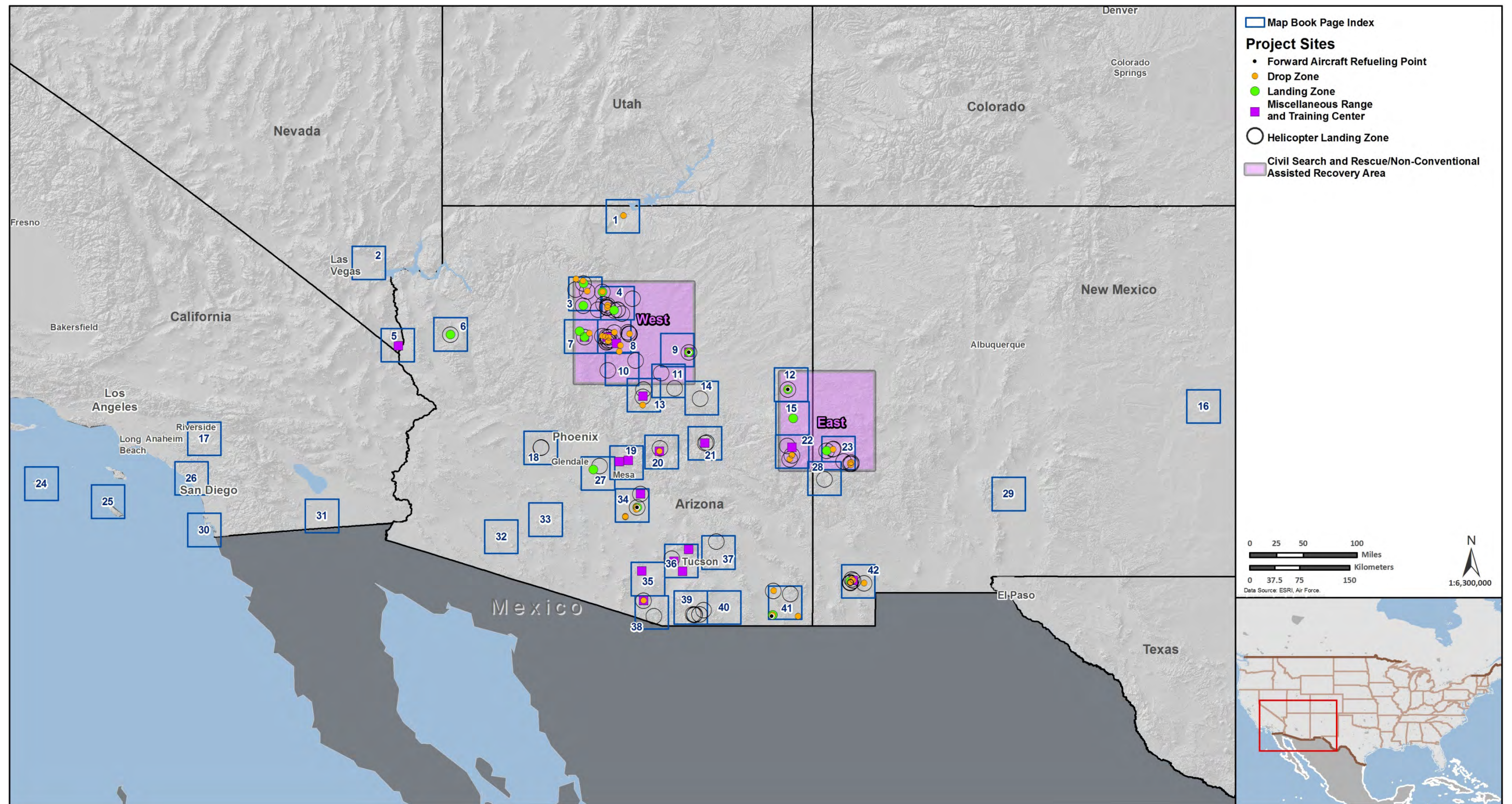


Figure C-2. Proposed Action Overview Map for USFS and Private Lands

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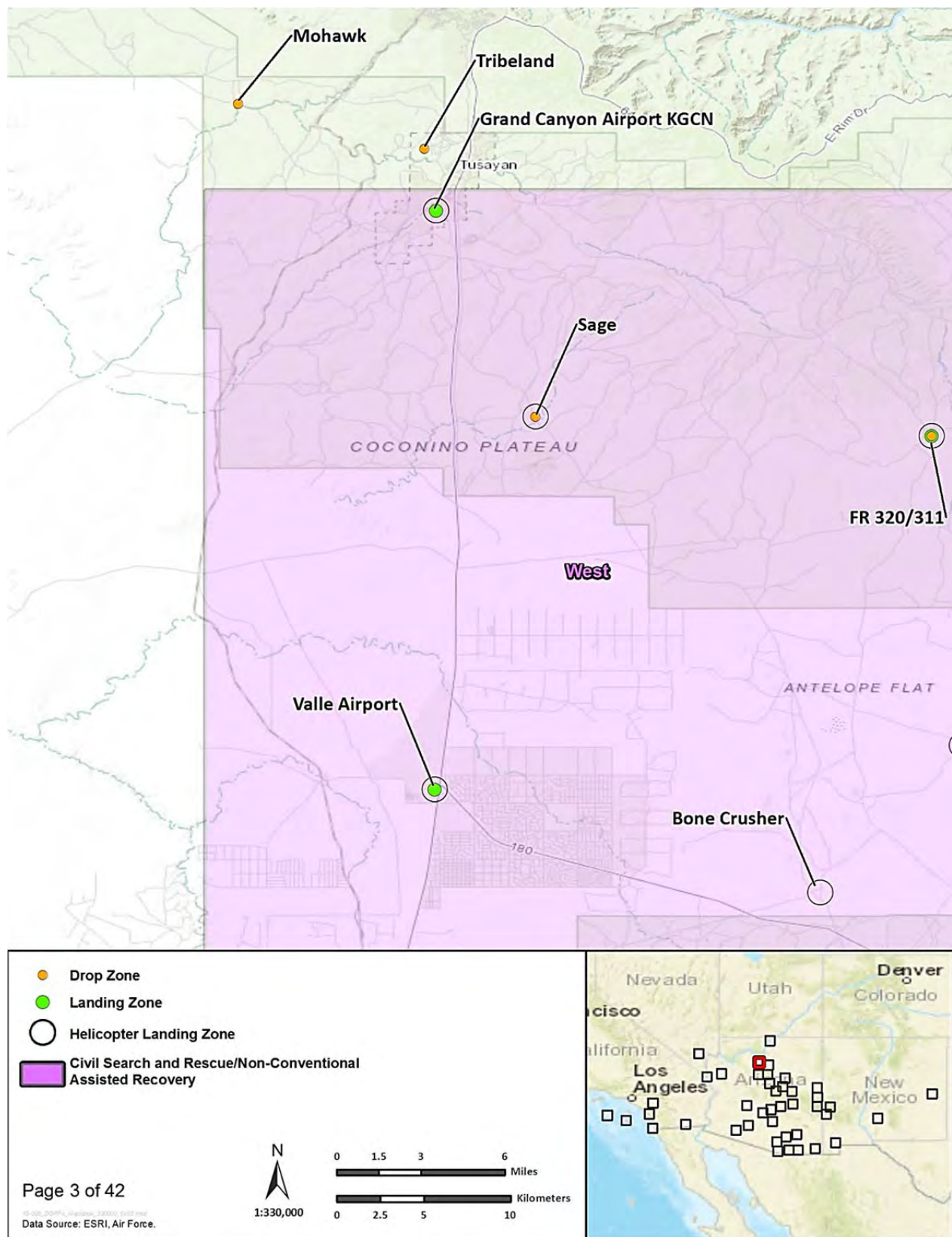


Figure C-5. Map 3 of 42

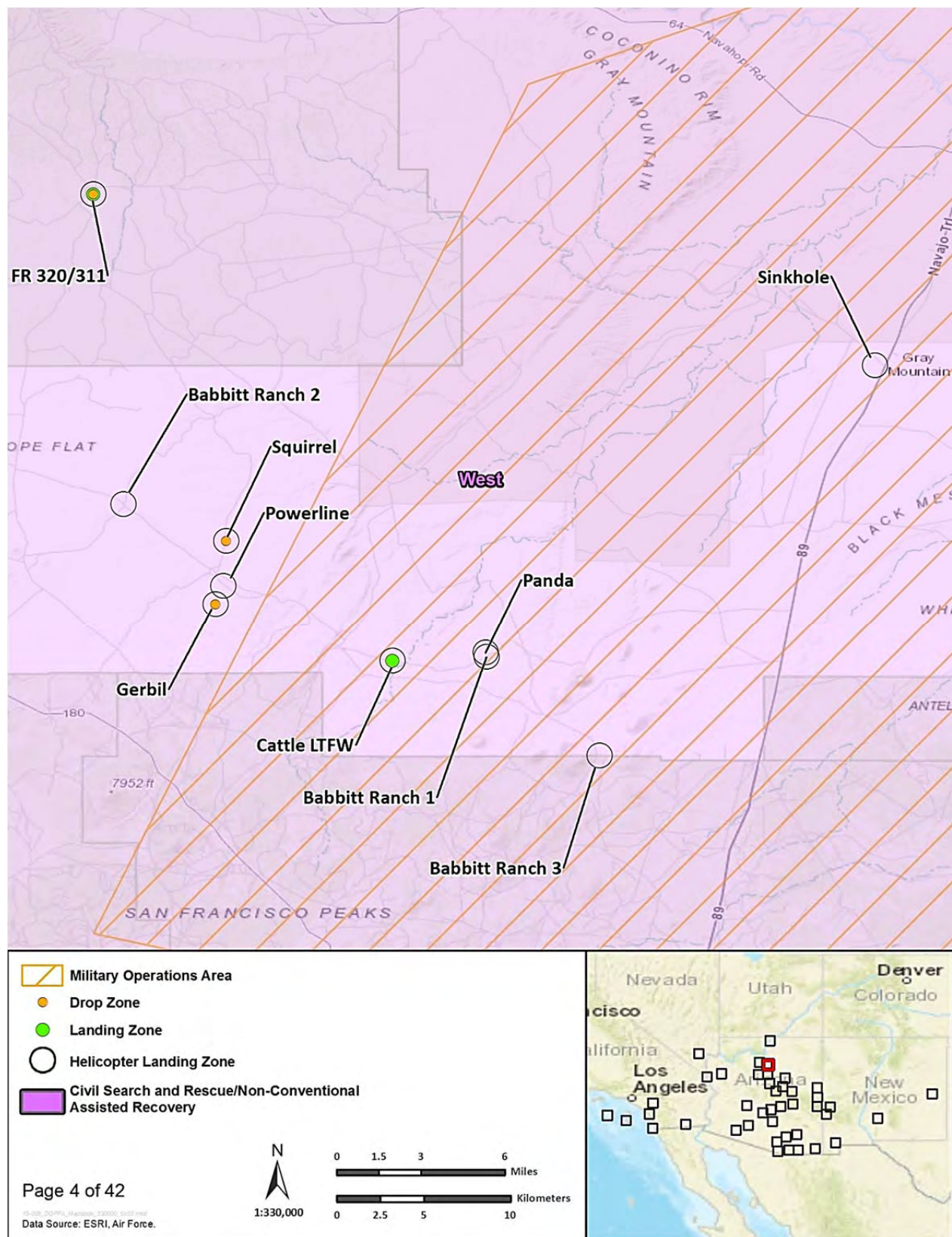
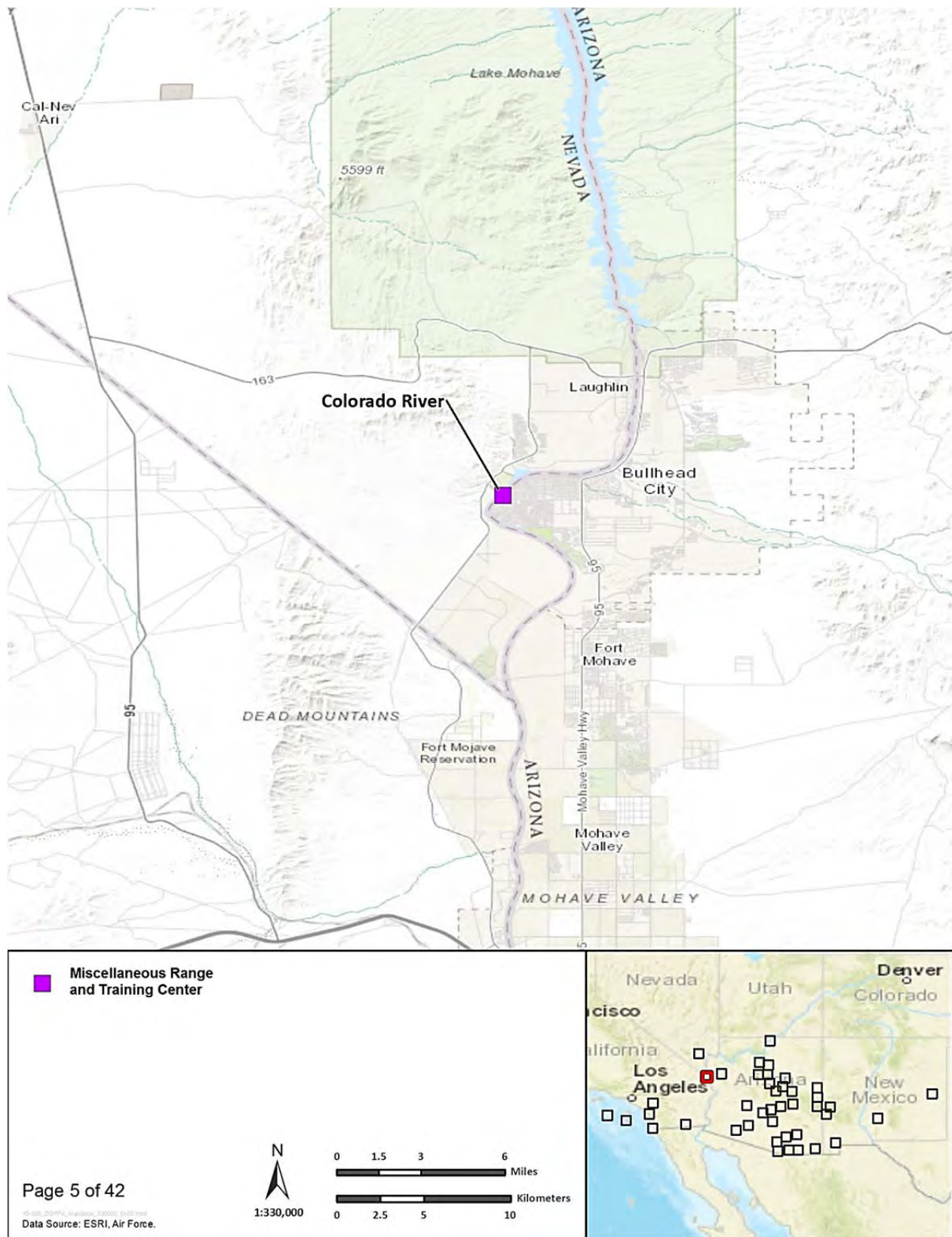


Figure C-6. Map 4 of 42



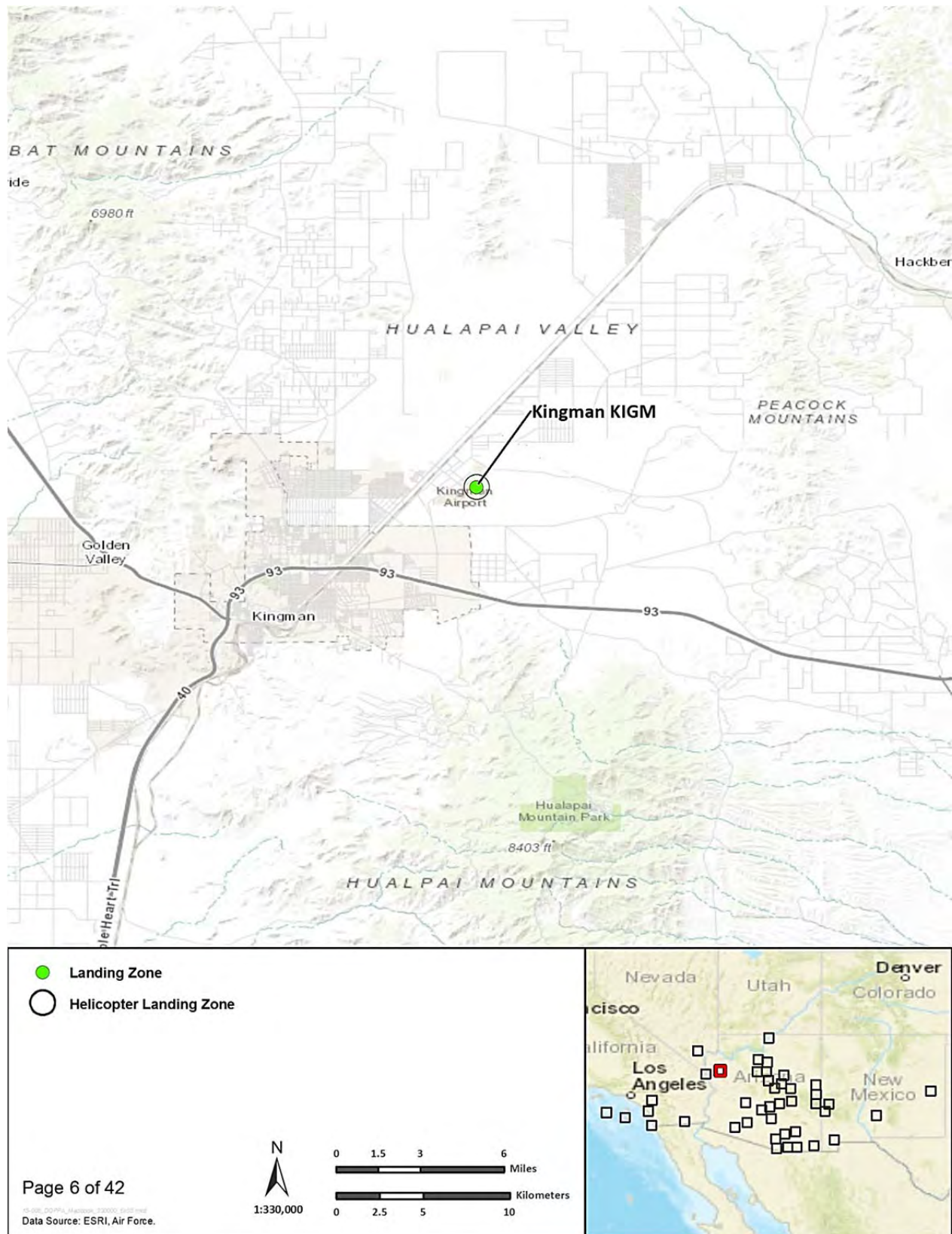


Figure C-8. Map 6 of 42

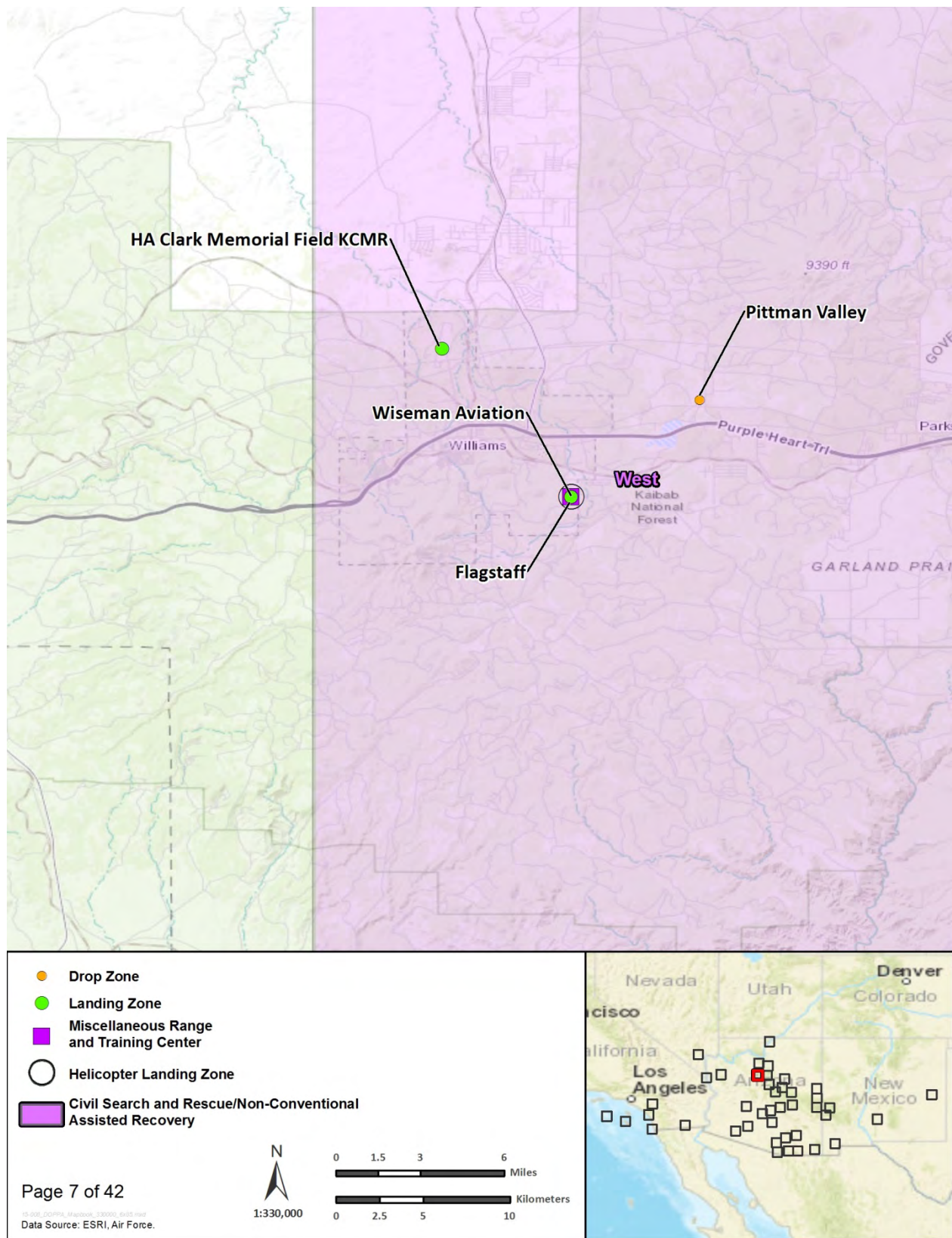


Figure C-9. Map 7 of 42

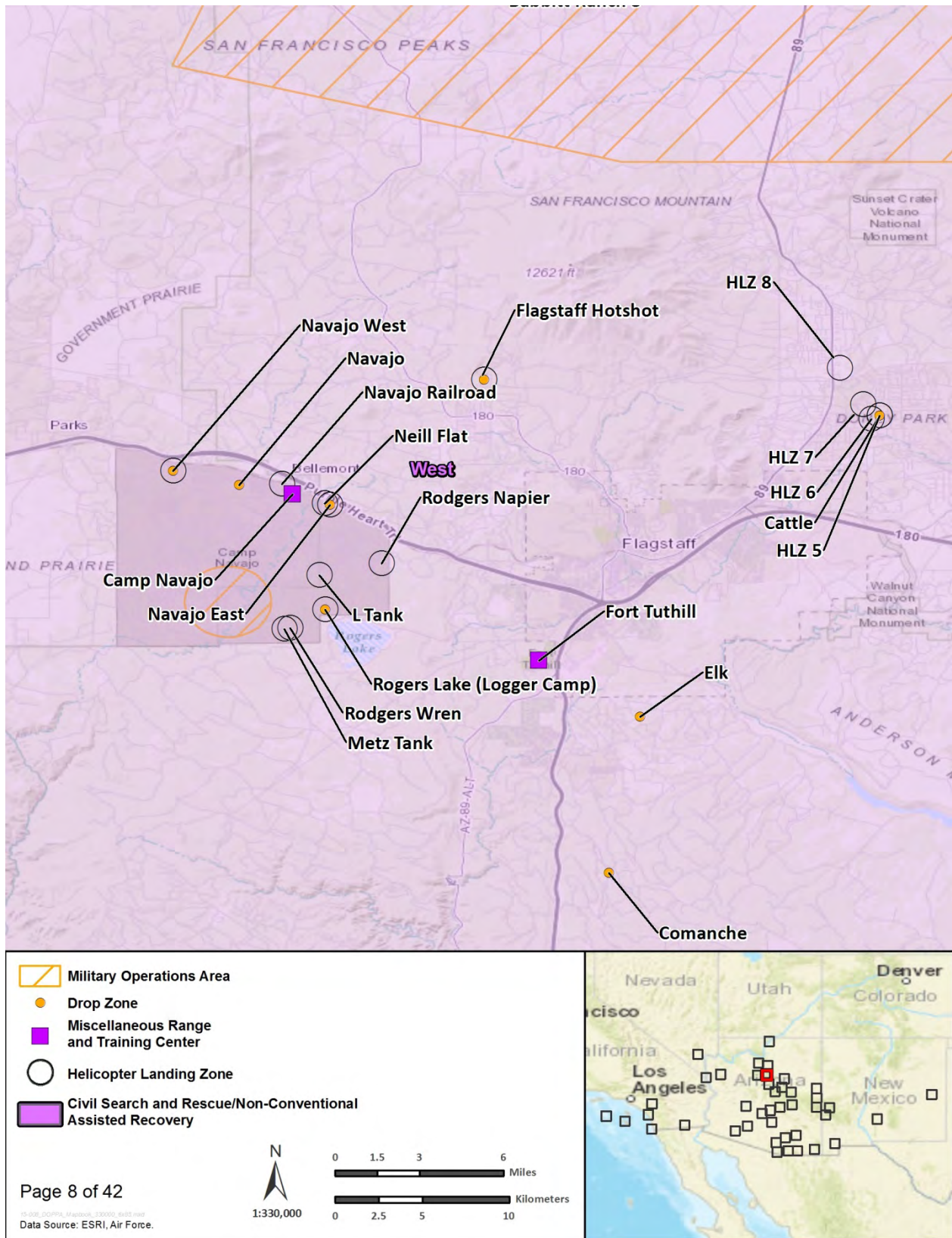


Figure C-10. Map 8 of 42

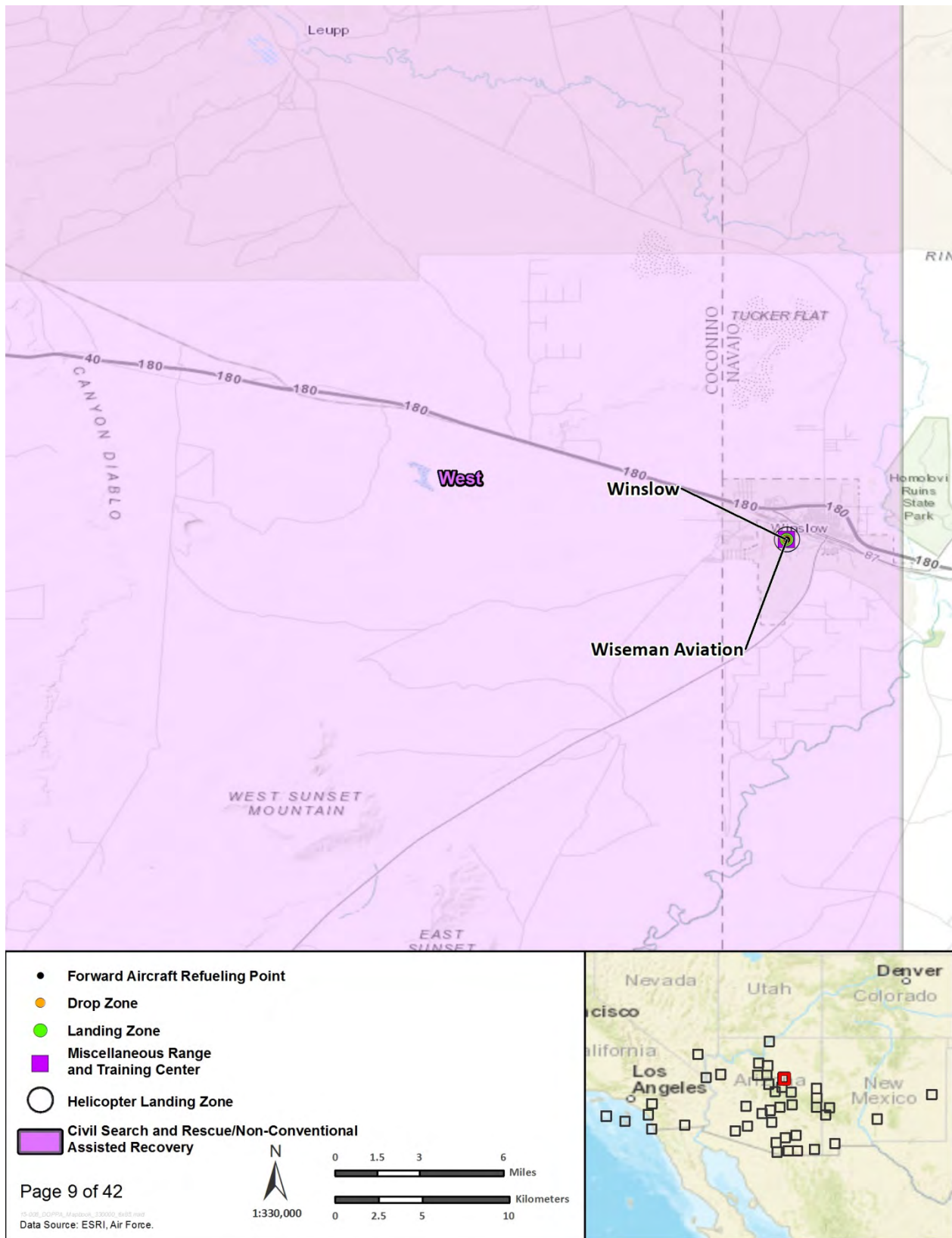


Figure C-11. Map 9 of 42

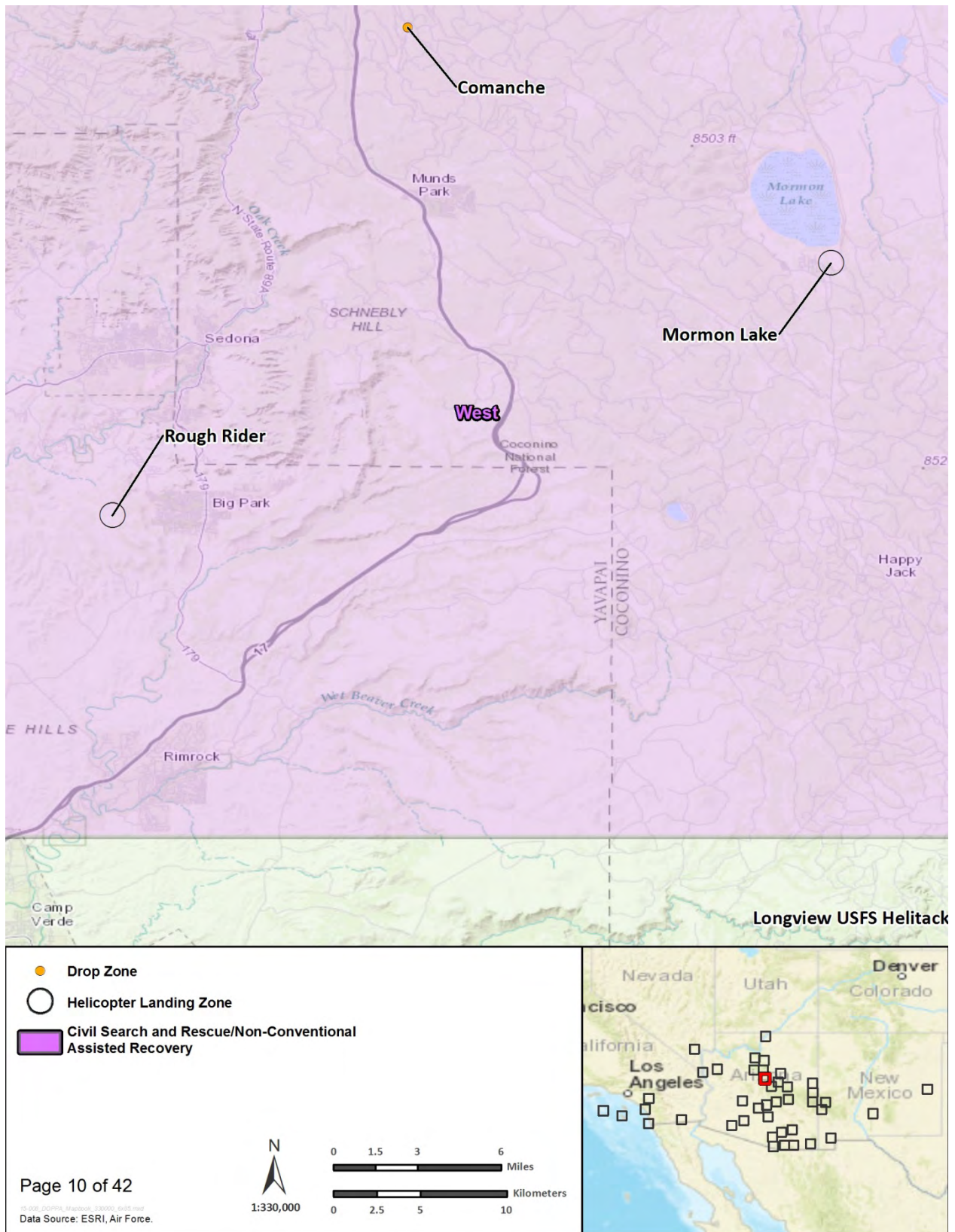


Figure C-12. Map 10 of 42

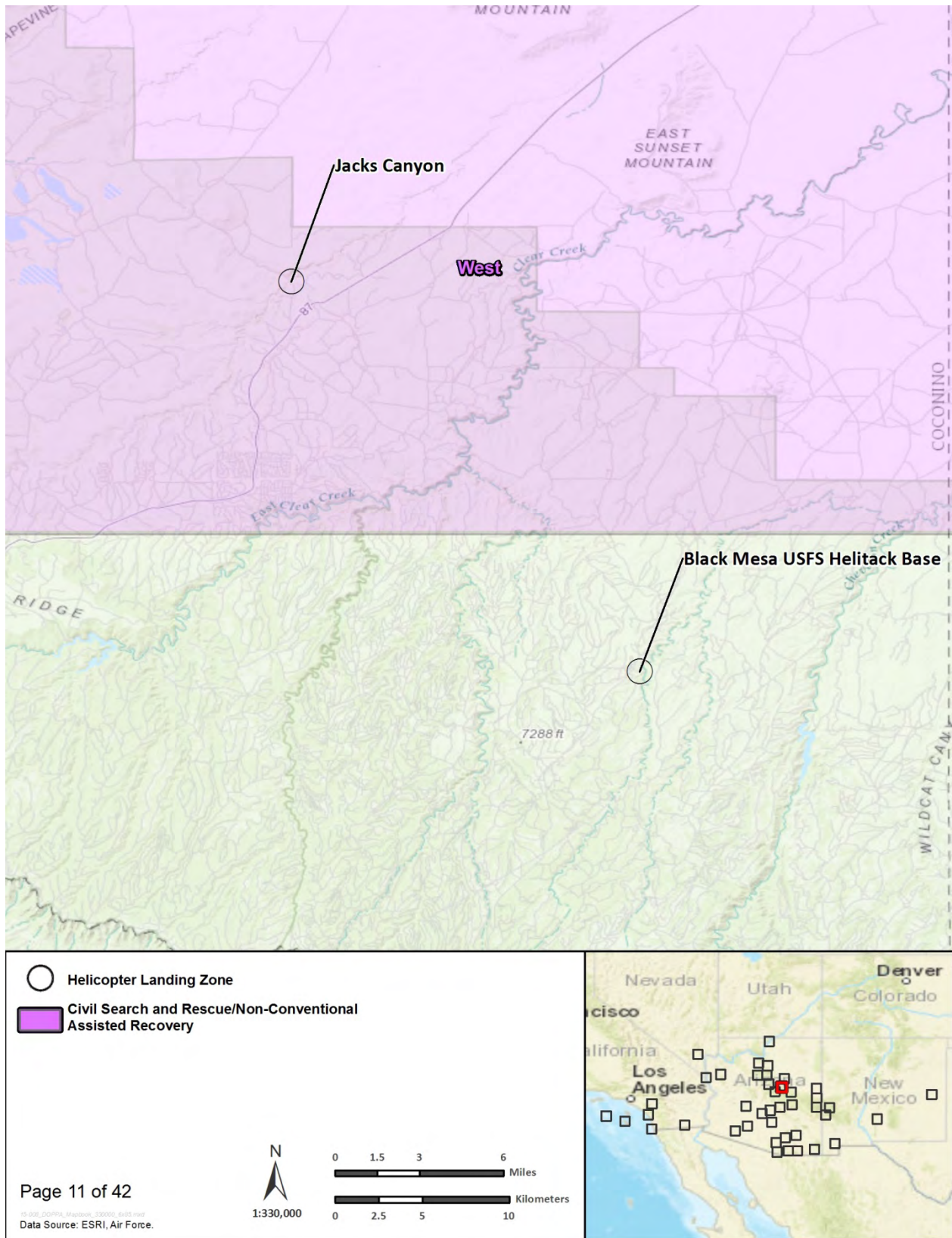


Figure C-13. Map 11 of 42

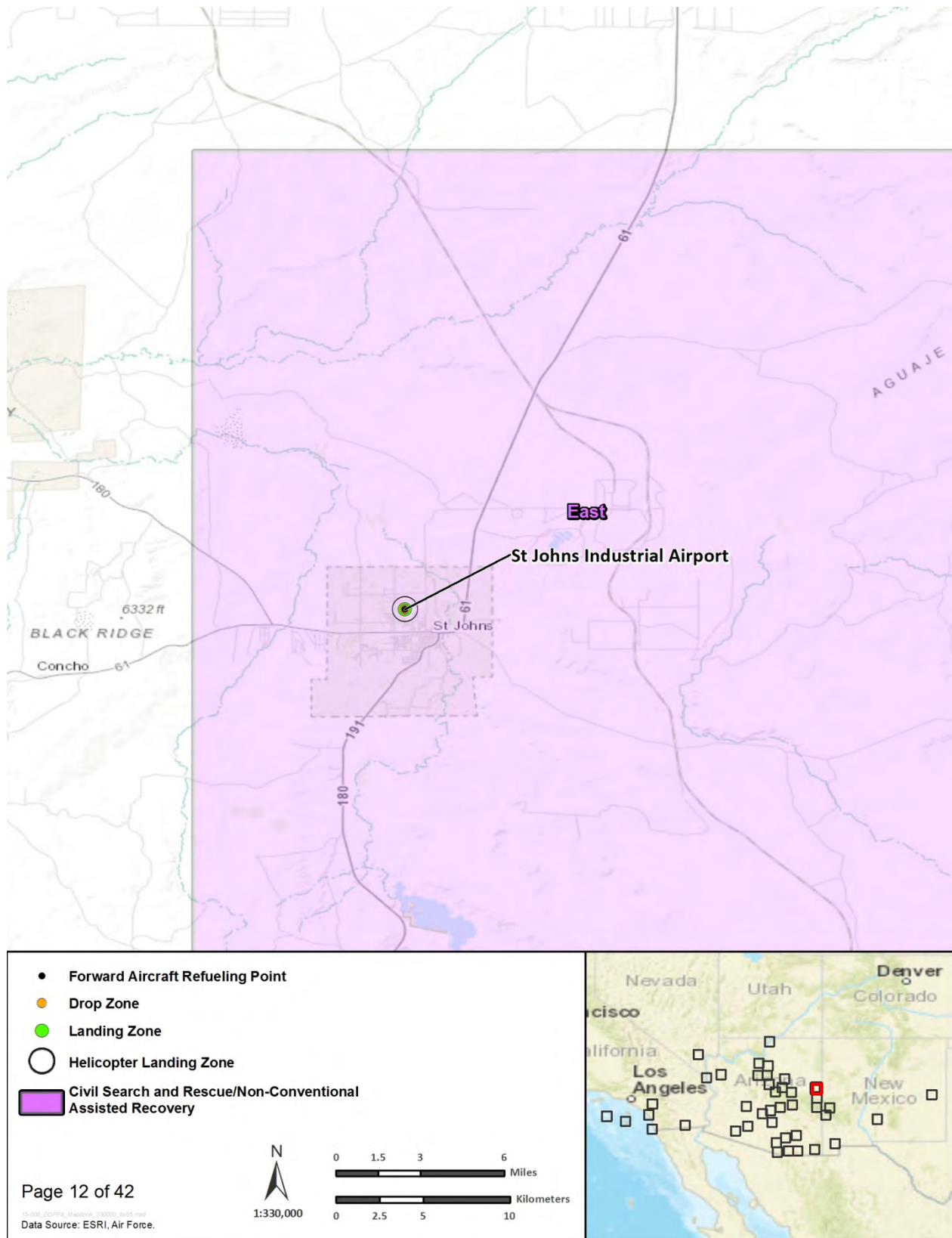


Figure C-14. Map 12 of 42

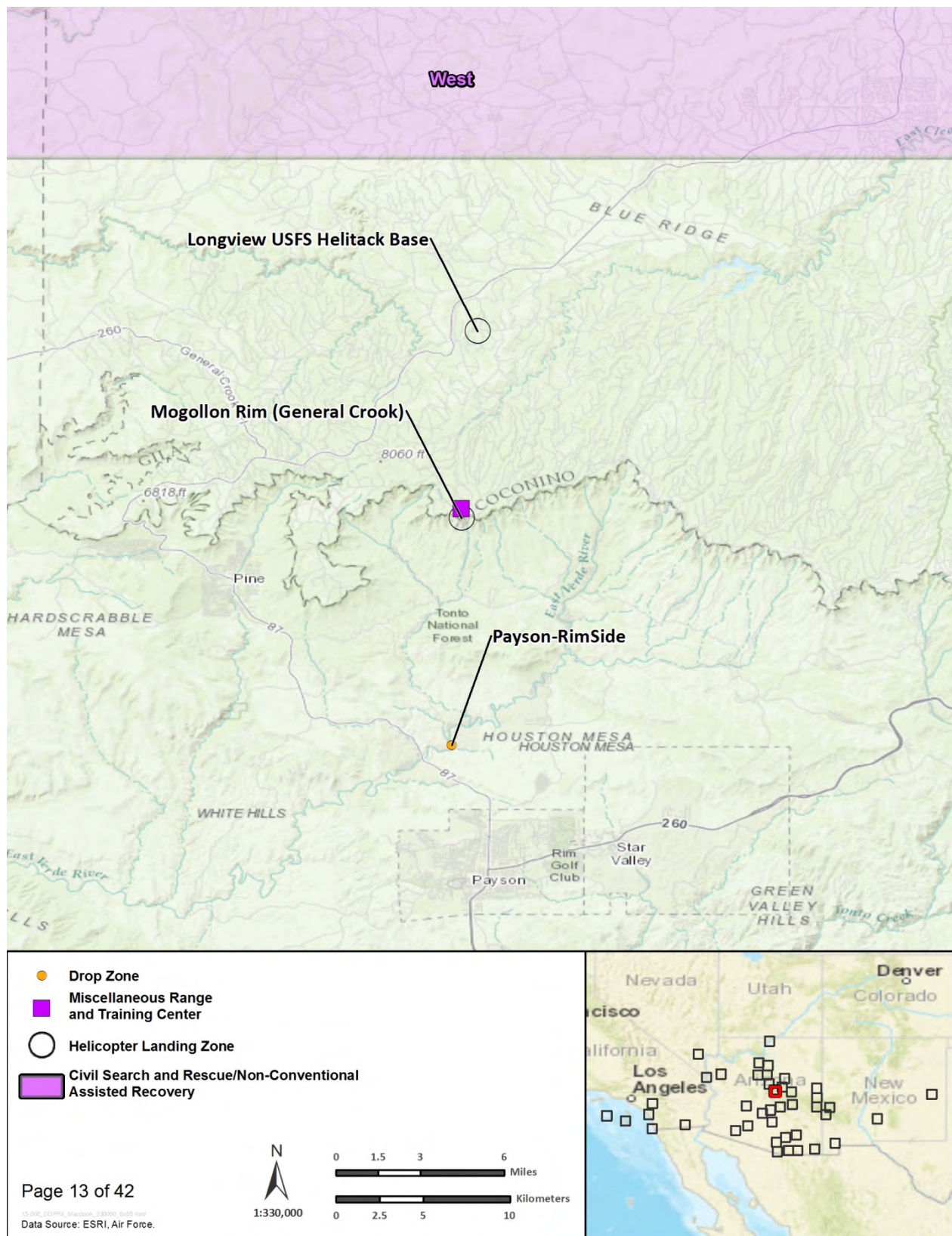


Figure C-15. Map 13 of 42

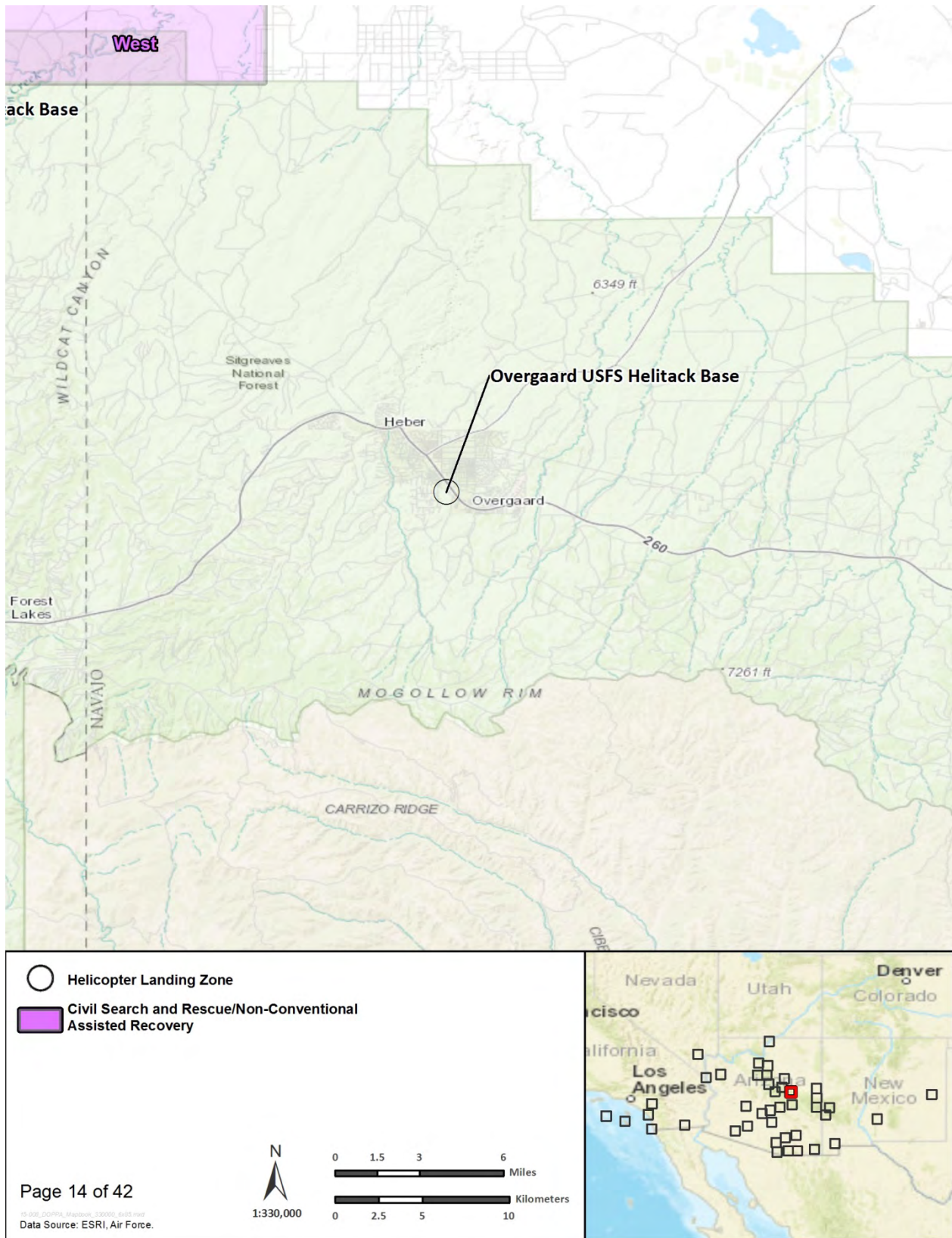


Figure C-16. Map 14 of 42

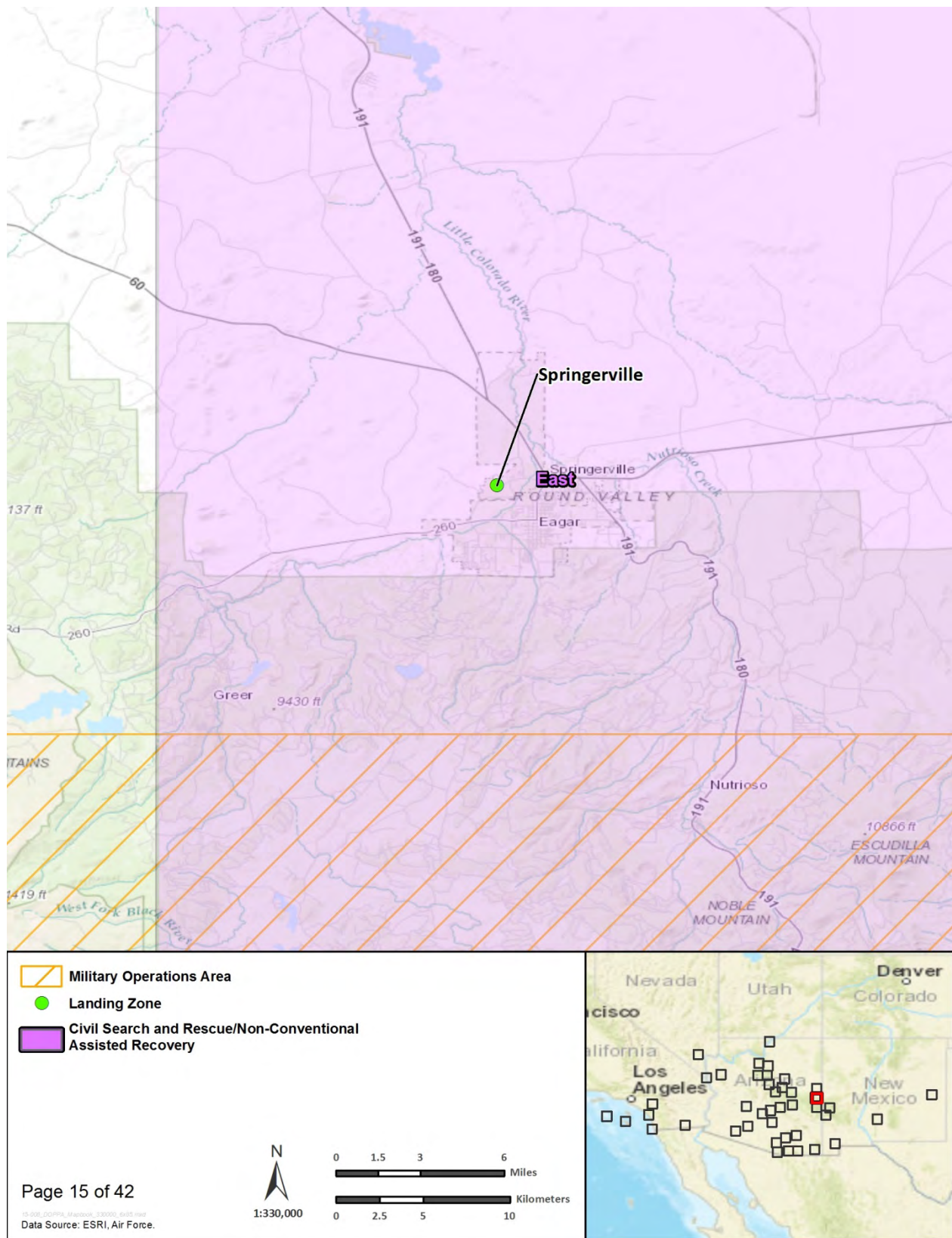


Figure C-17. Map 15 of 42

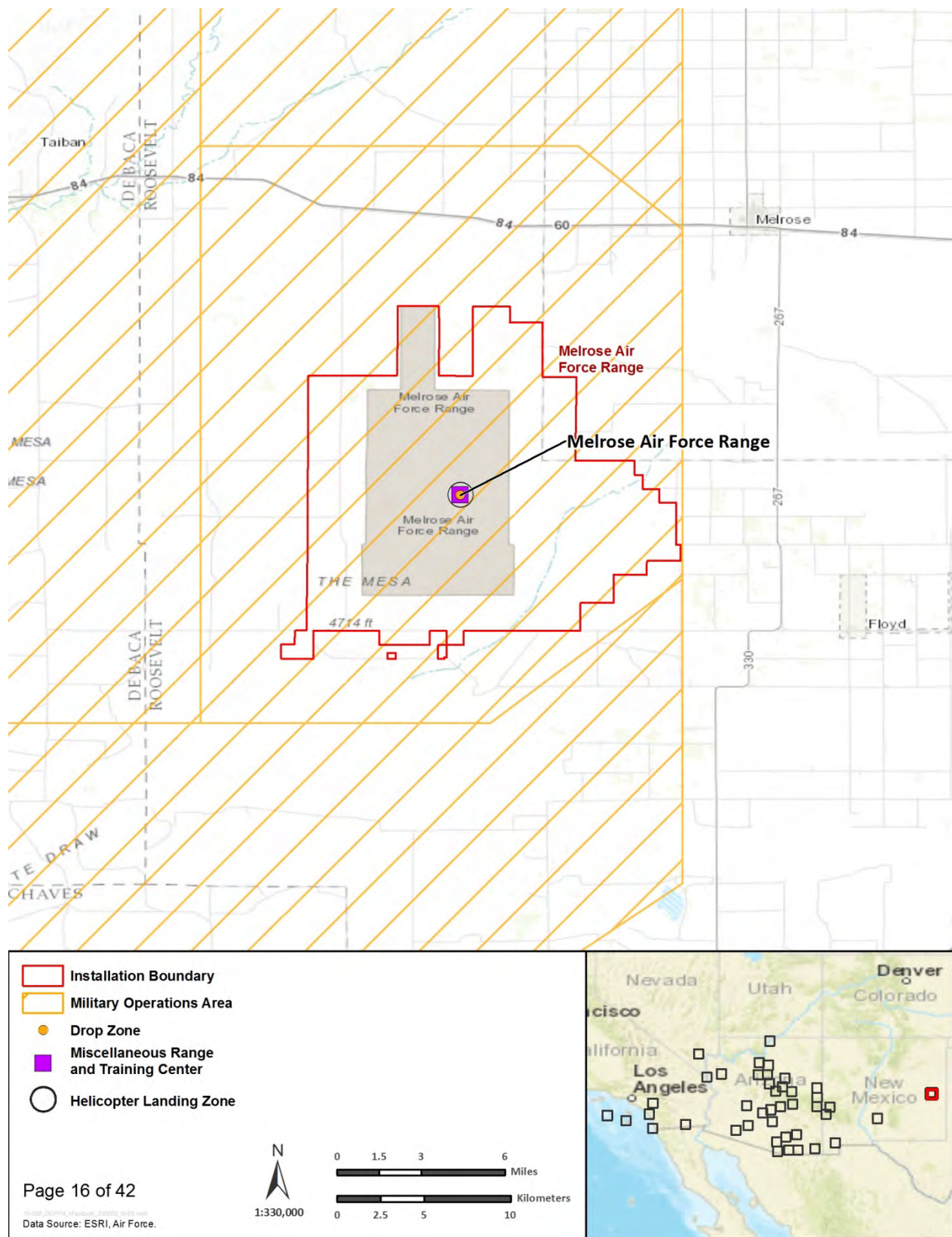


Figure C-18. Map 16 of 42

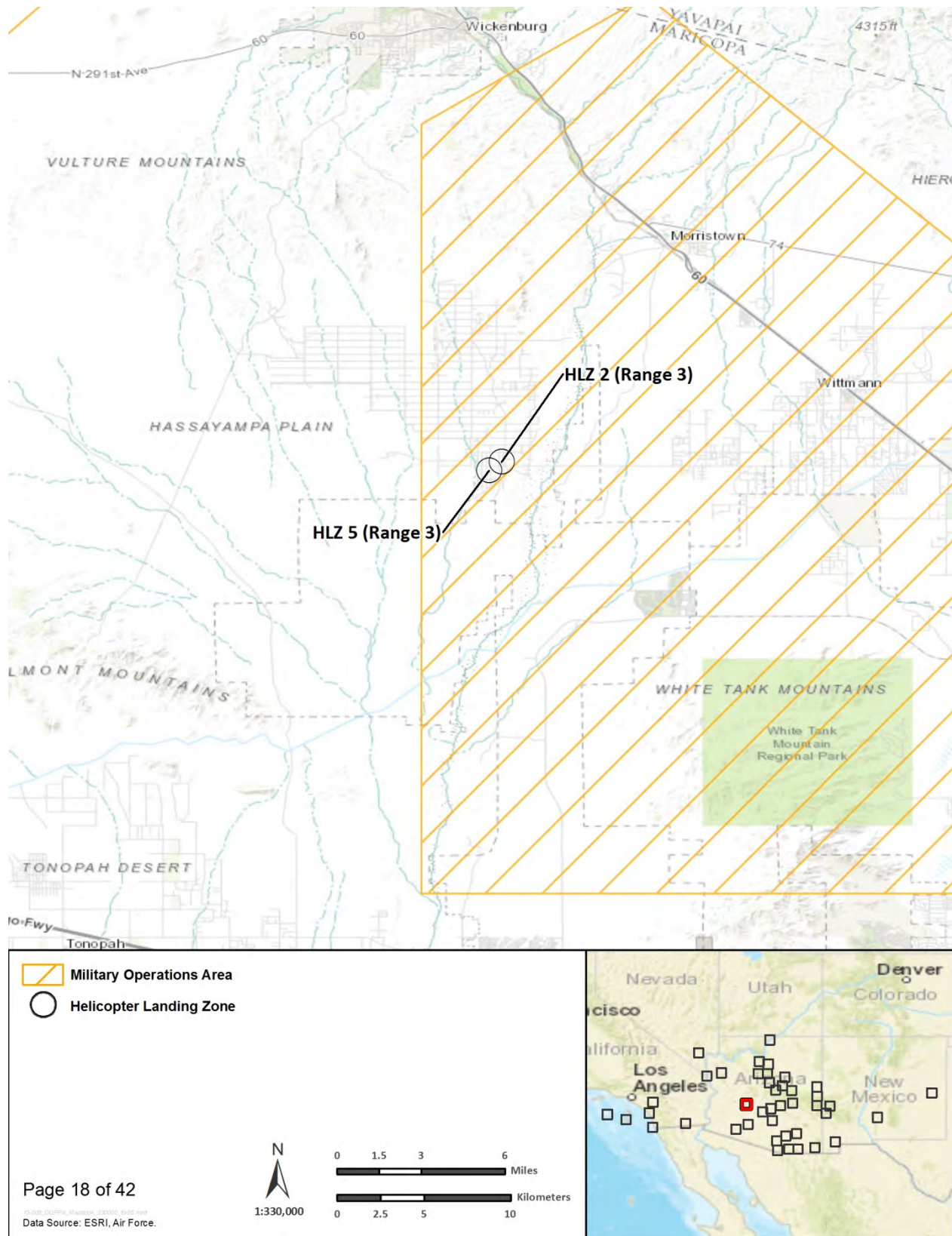


Figure C-20. Map 18 of 42

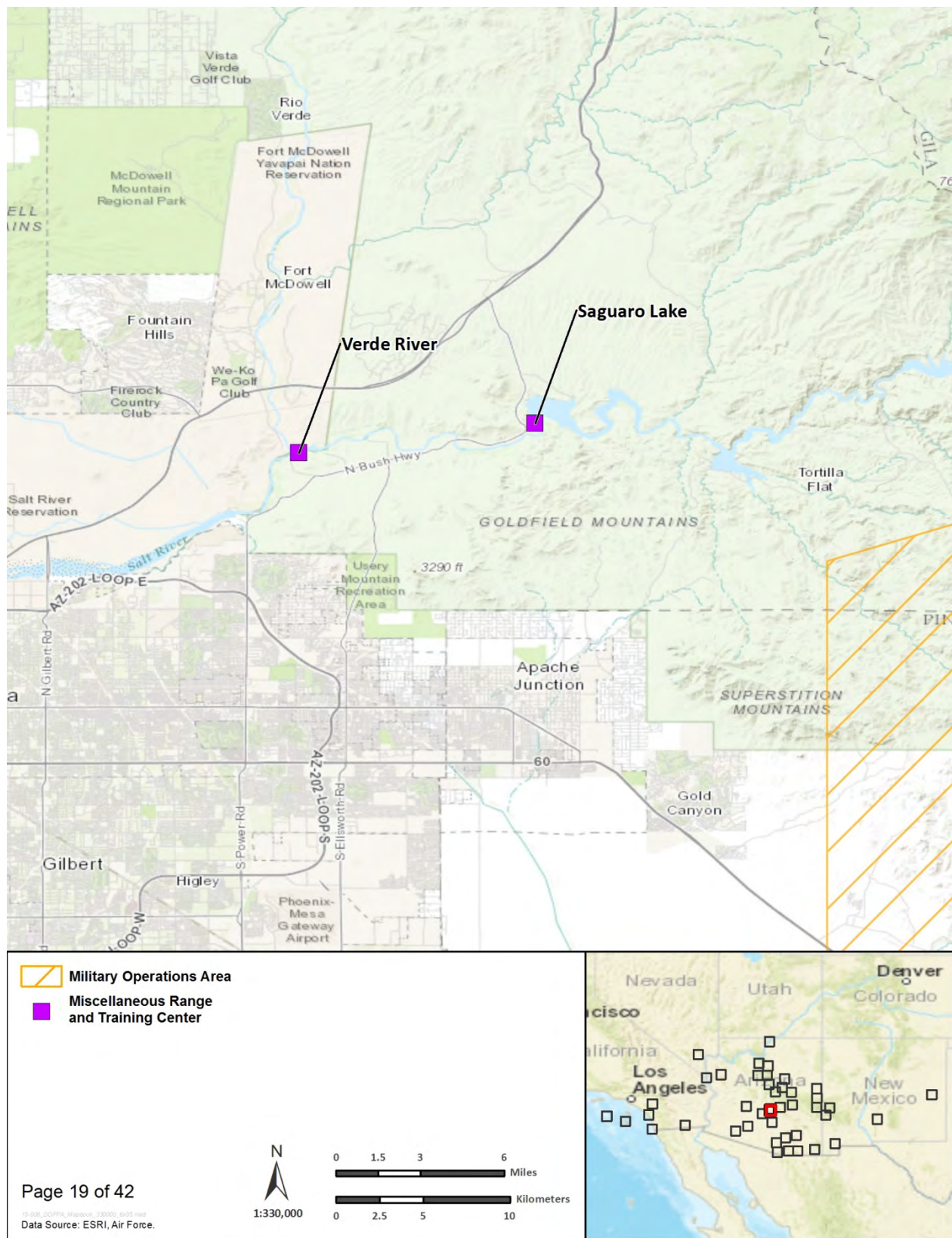


Figure C-21. Map 19 of 42

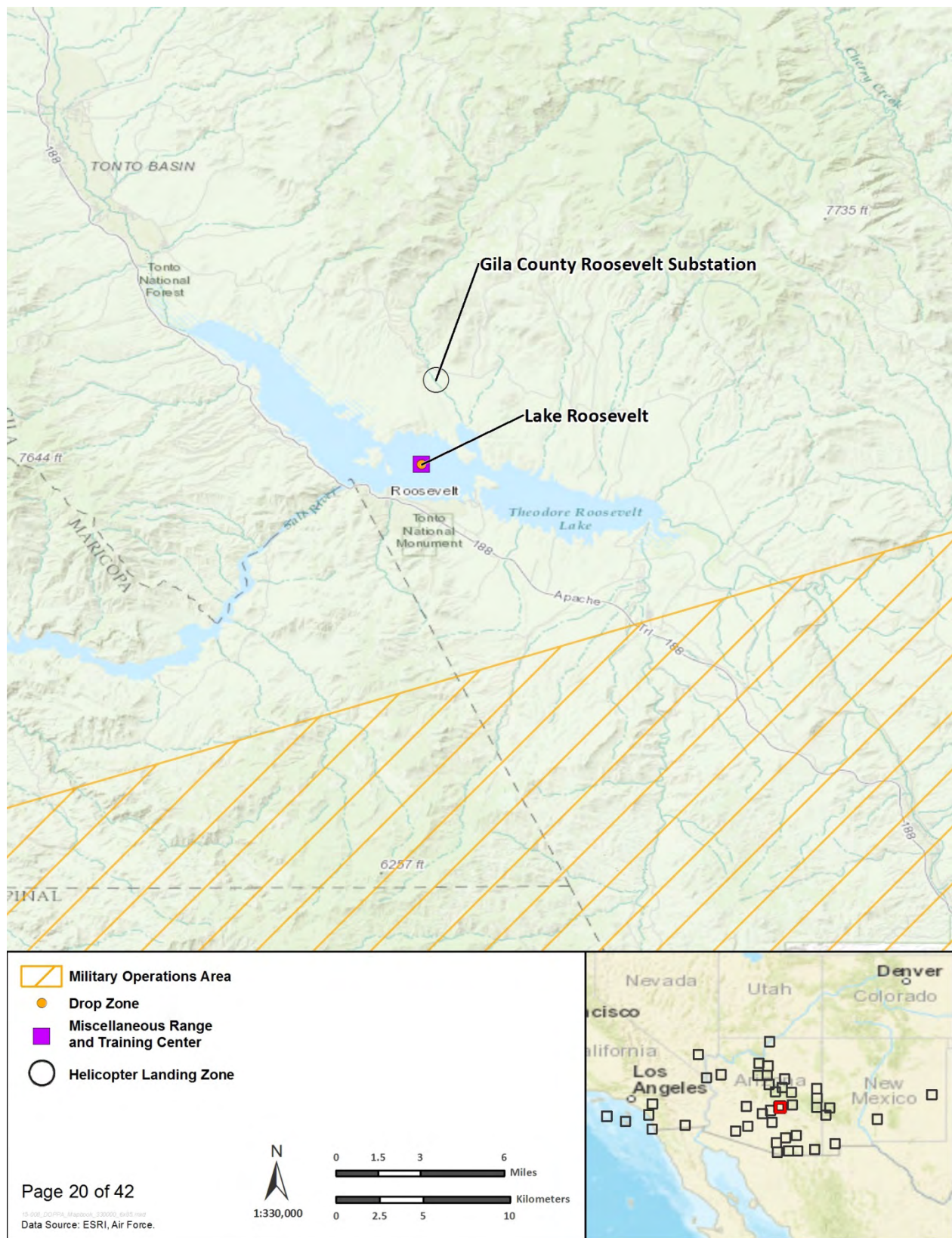


Figure C-22. Map 20 of 42

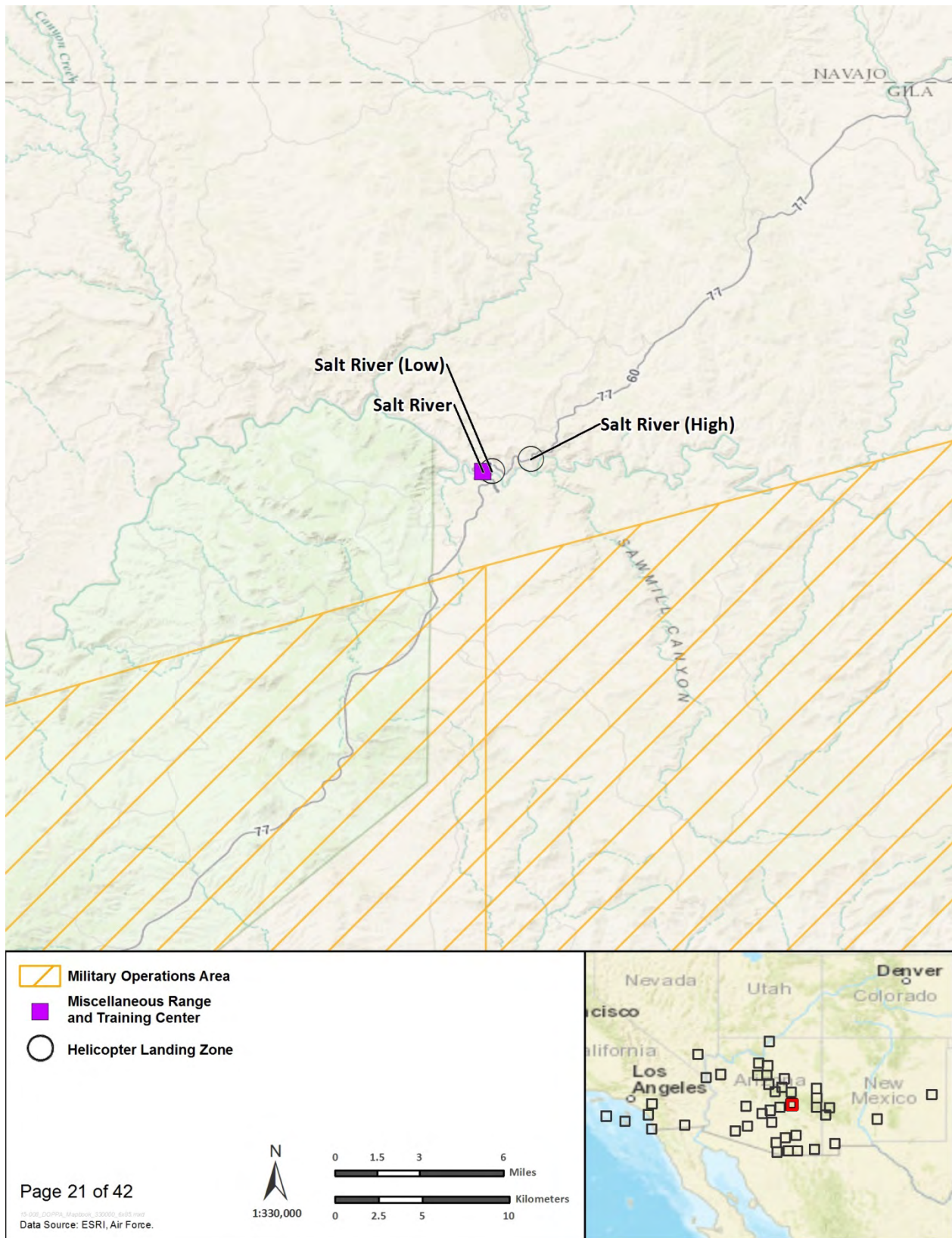


Figure C-23. Map 21 of 42

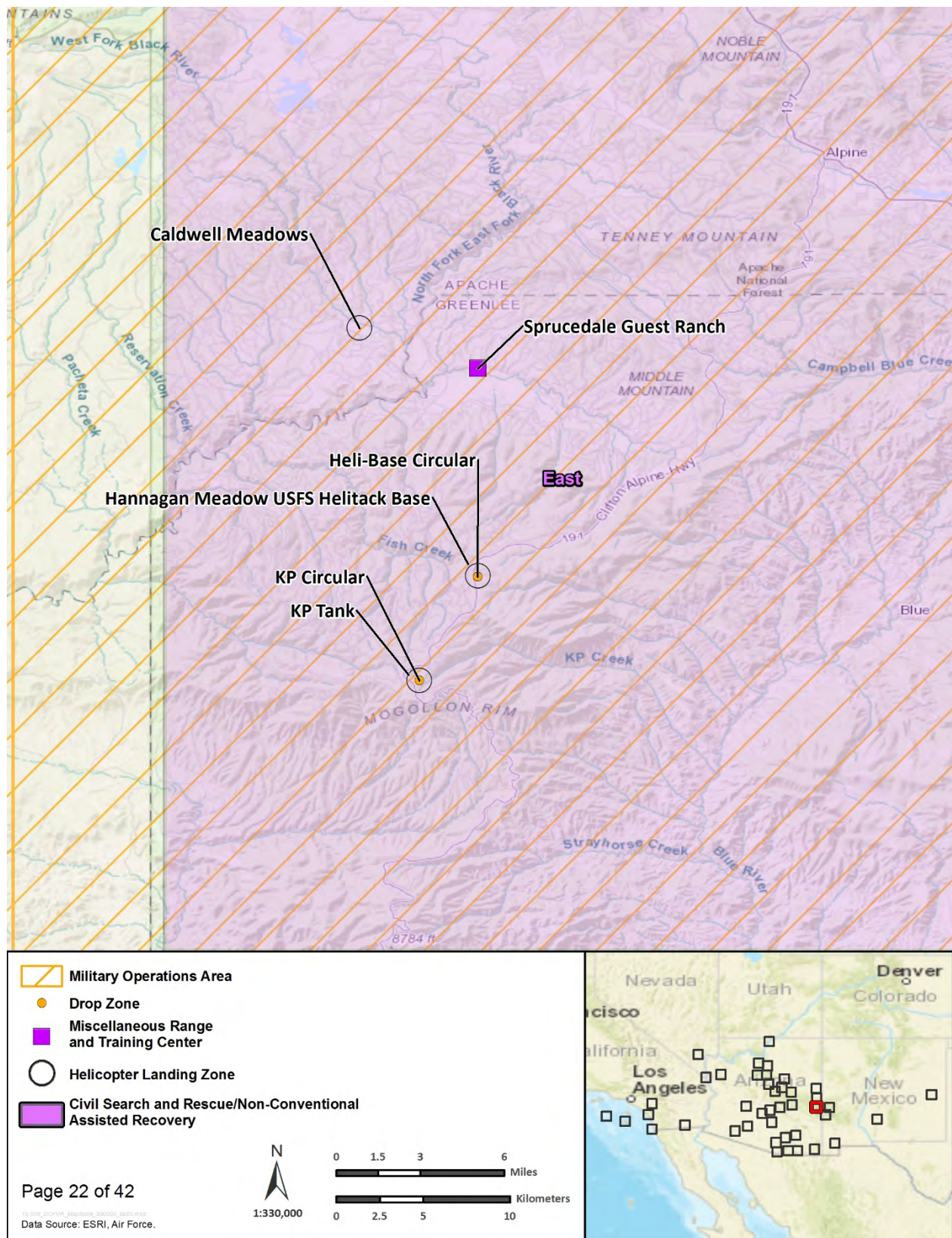


Figure C-24. Map 22 of 42



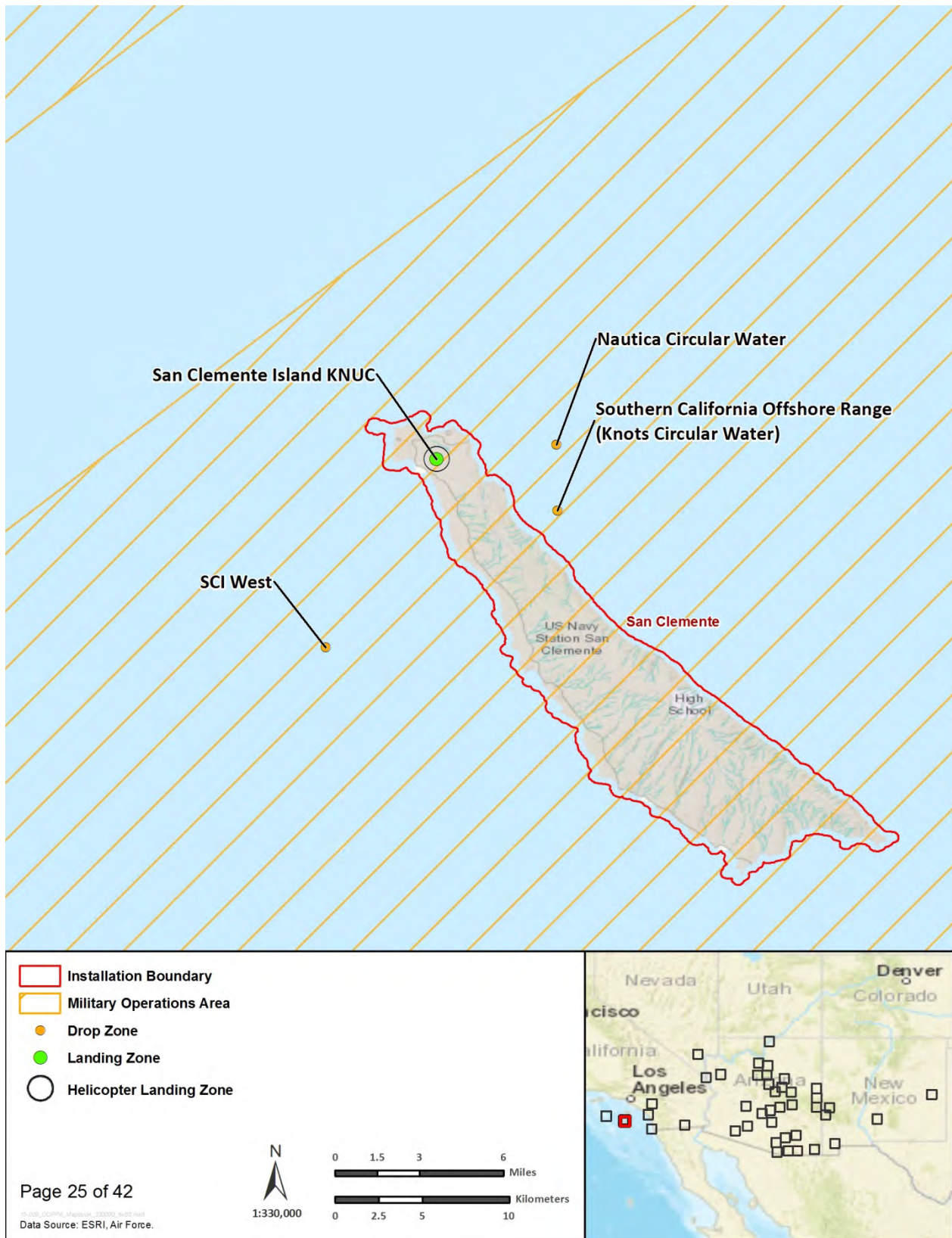


Figure C-27. Map 25 of 42

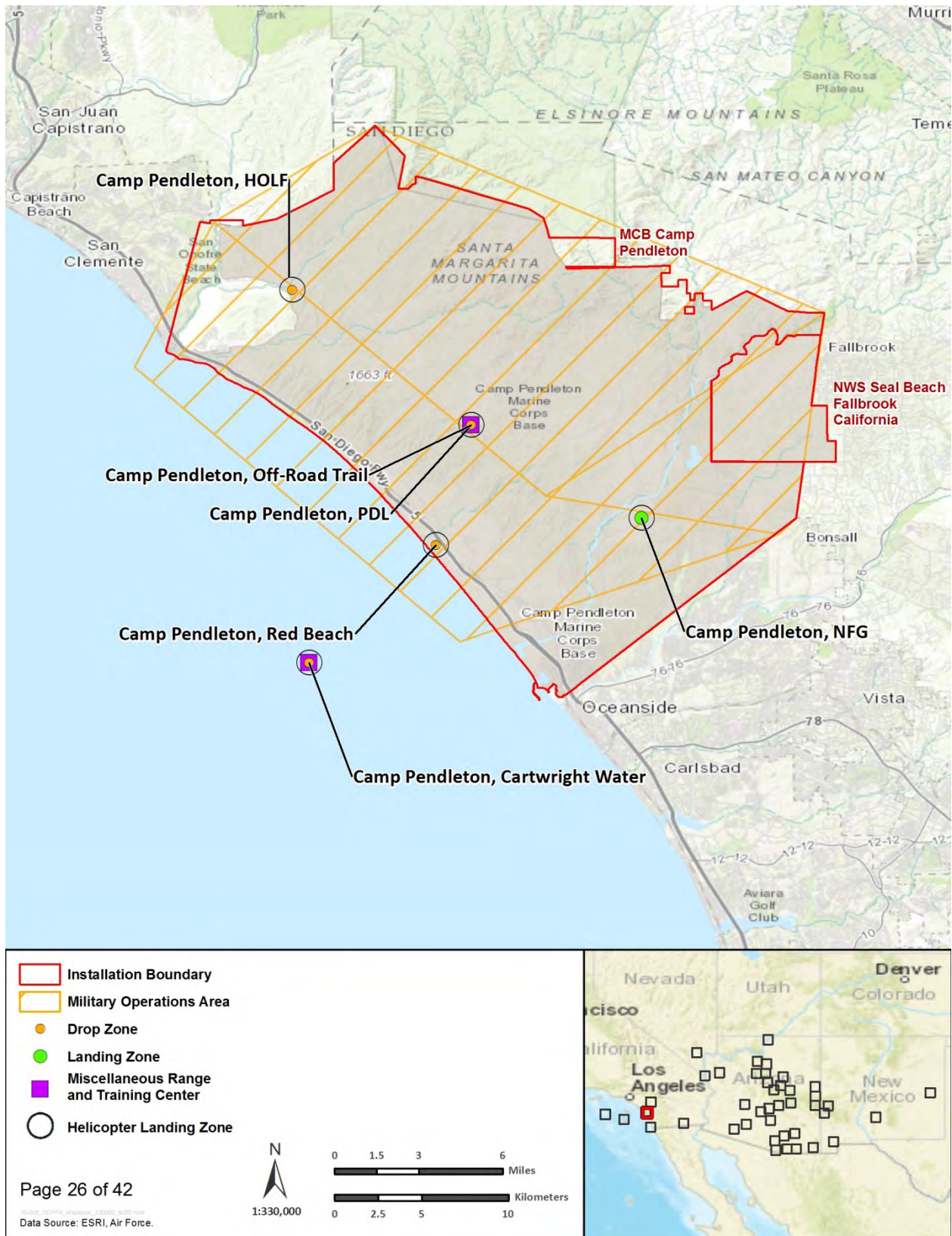


Figure C-28. Map 26 of 42

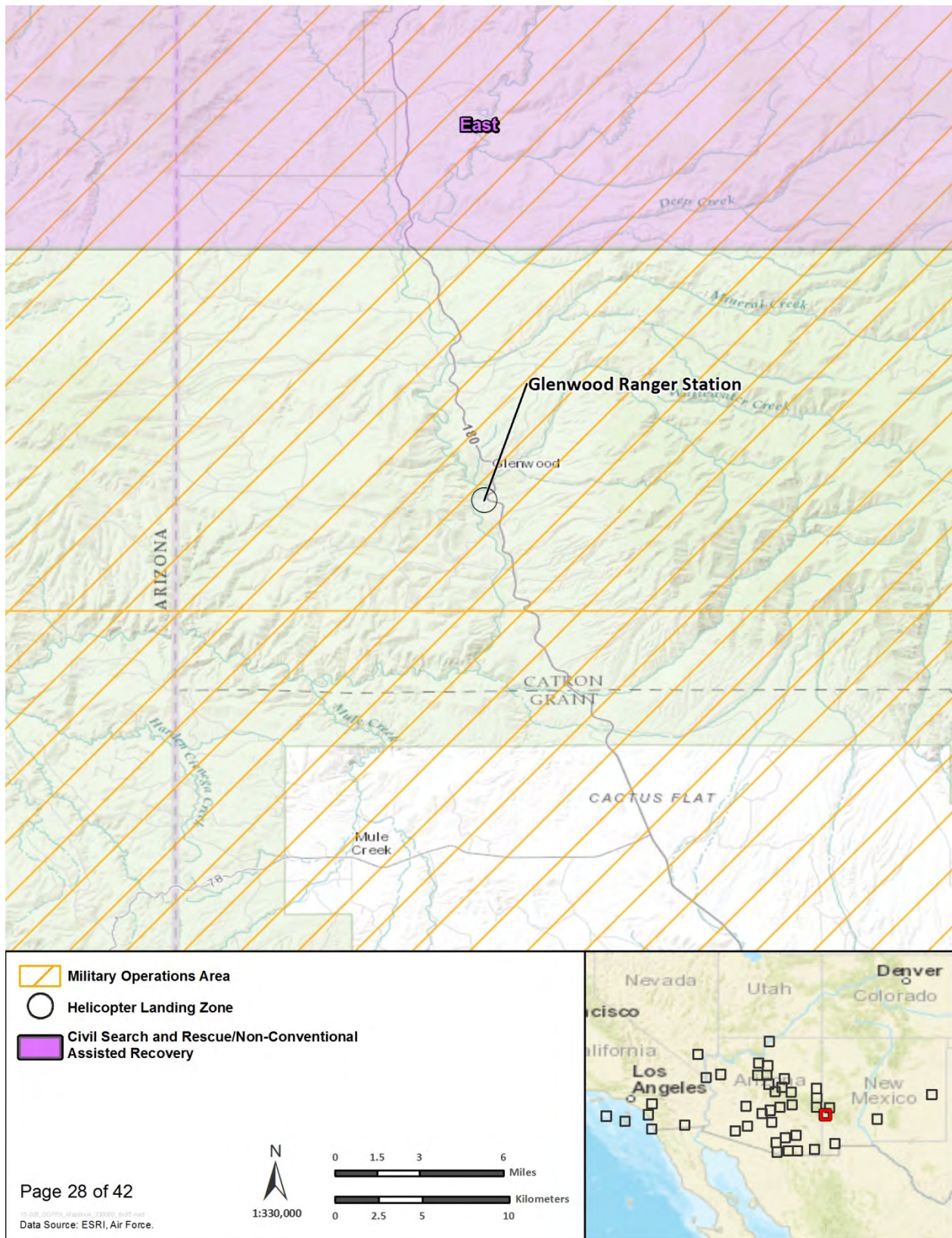


Figure C-30. Map 28 of 42





Figure C-32. Map 30 of 42

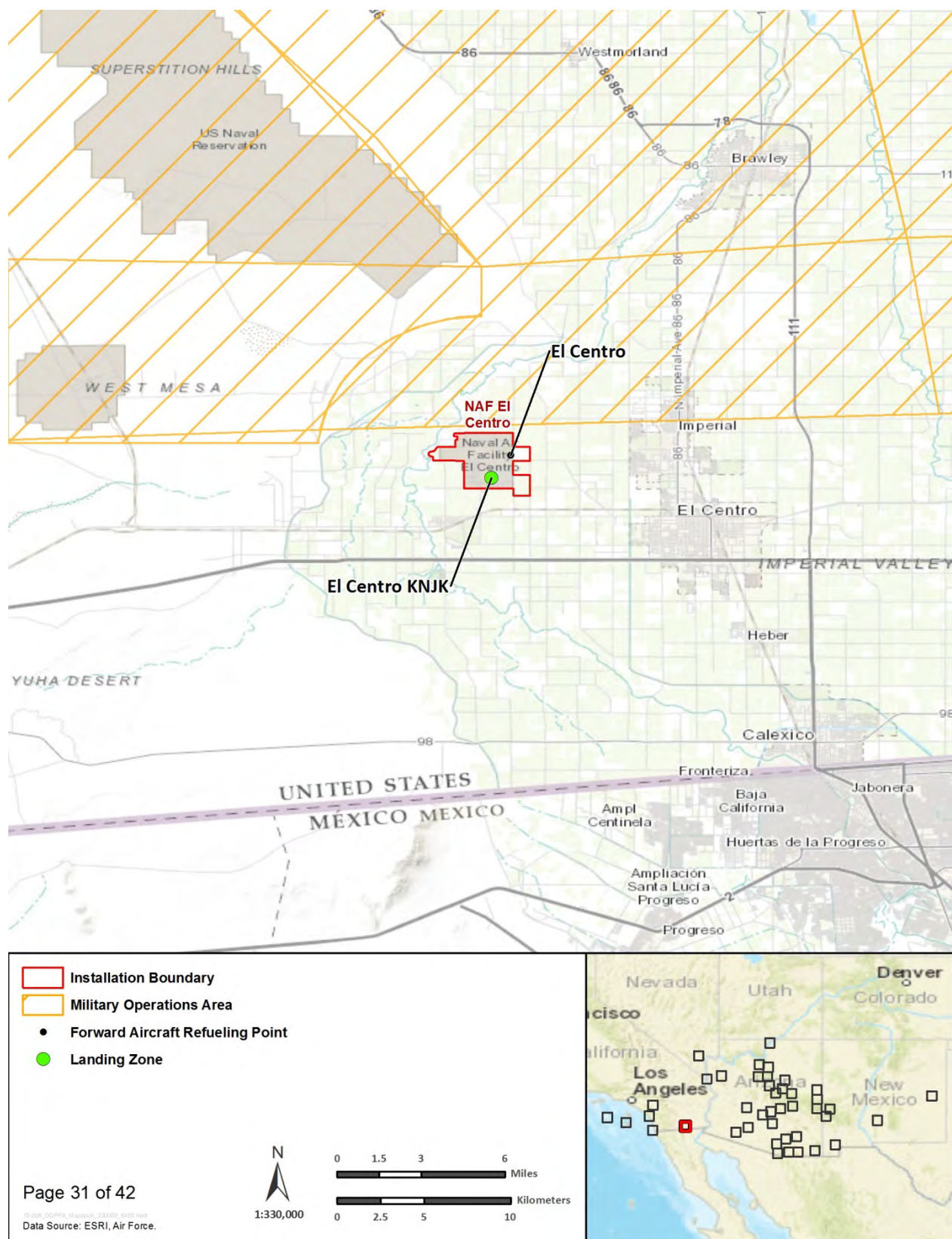


Figure C-33. Map 31 of 42



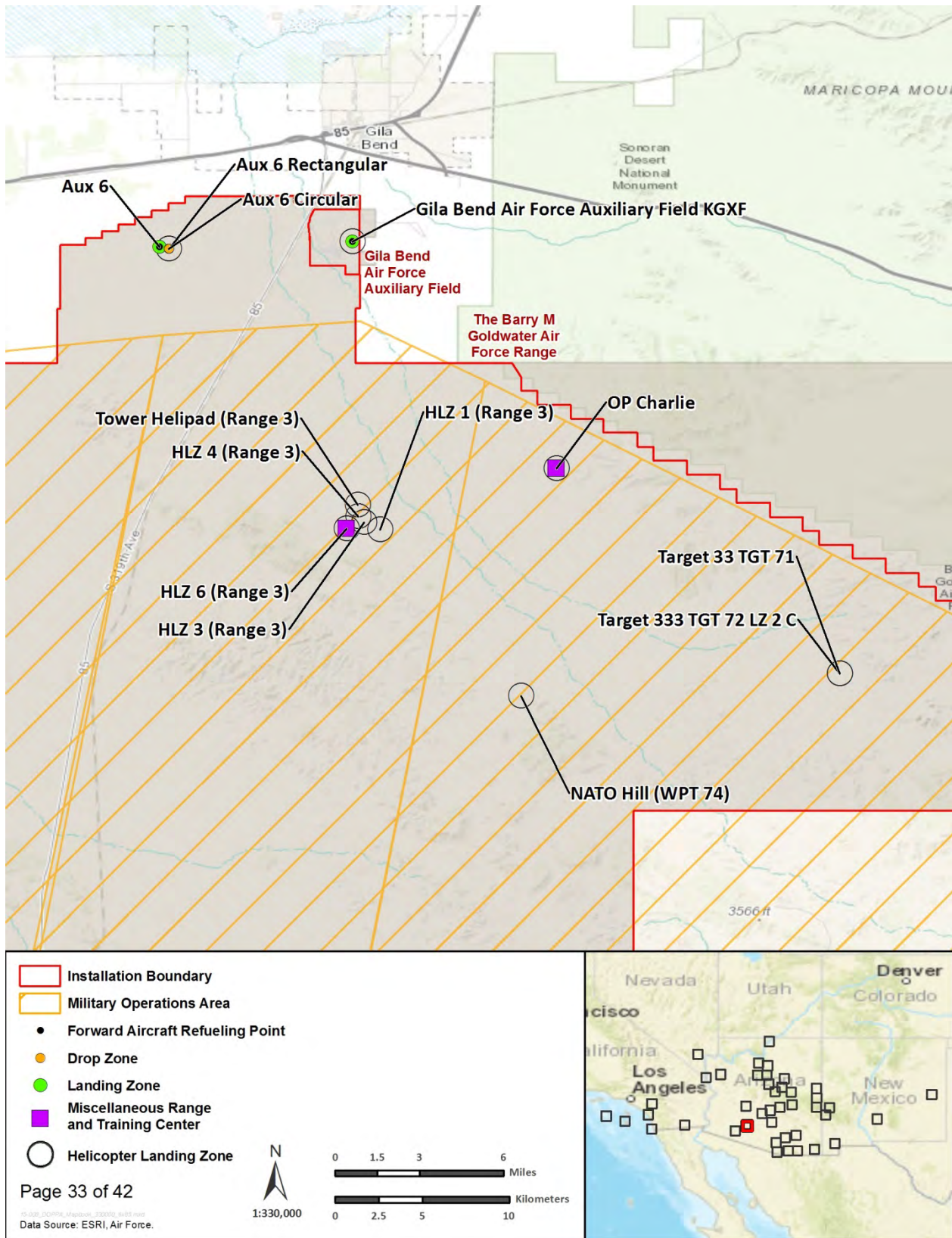


Figure C-35. Map 33 of 42

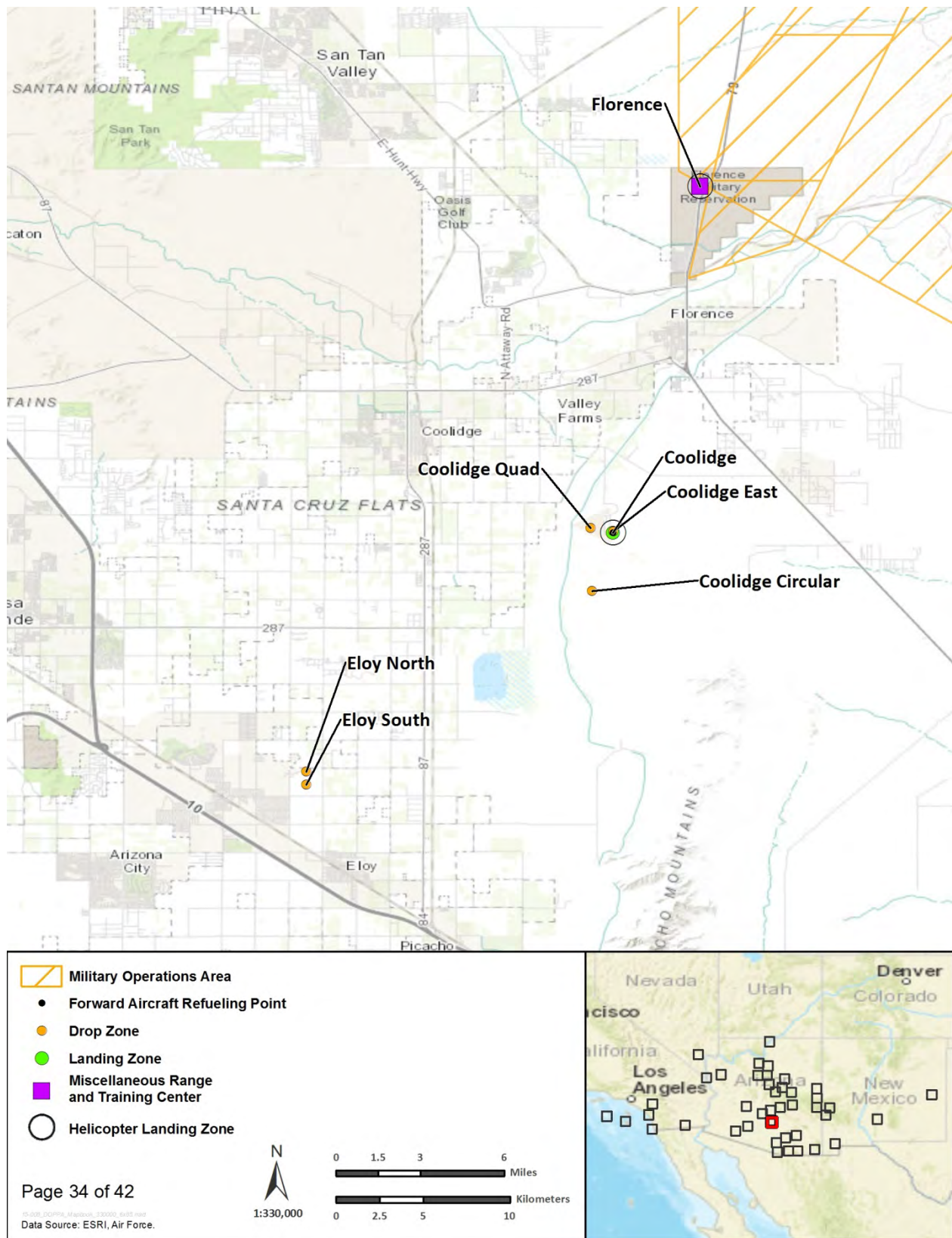


Figure C-36. Map 34 of 42



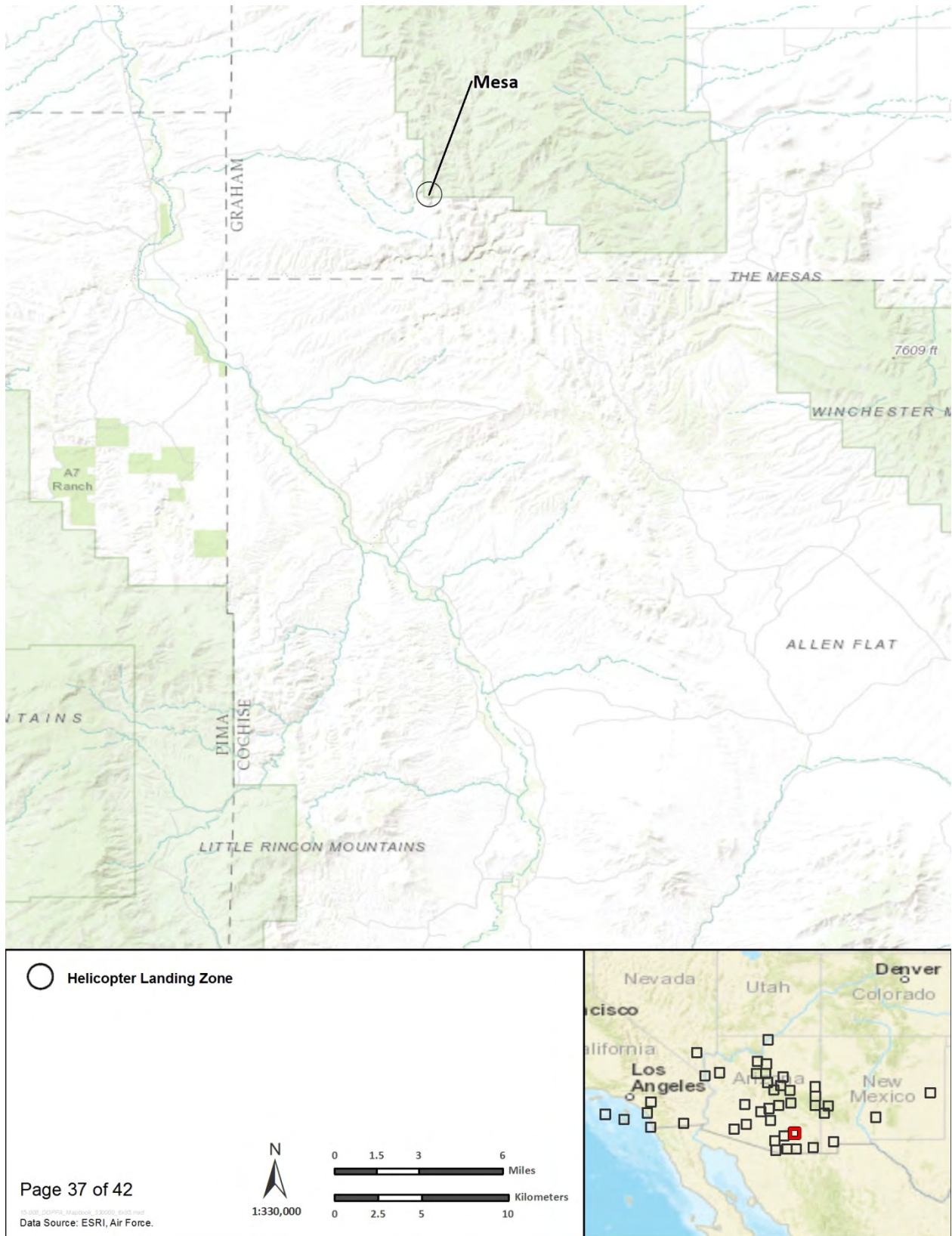


Figure C-39. Map 37 of 42

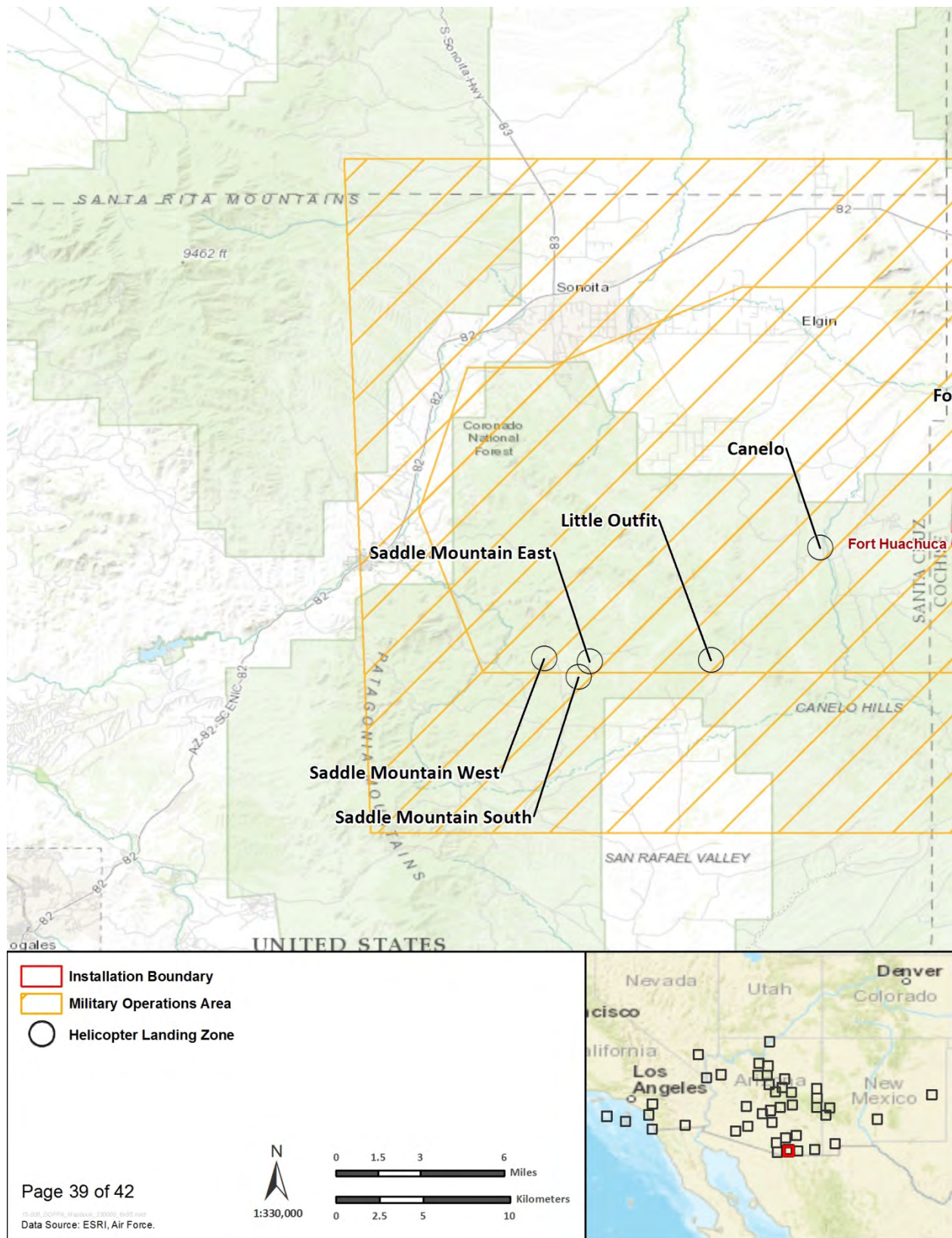


Figure C-41. Map 39 of 42

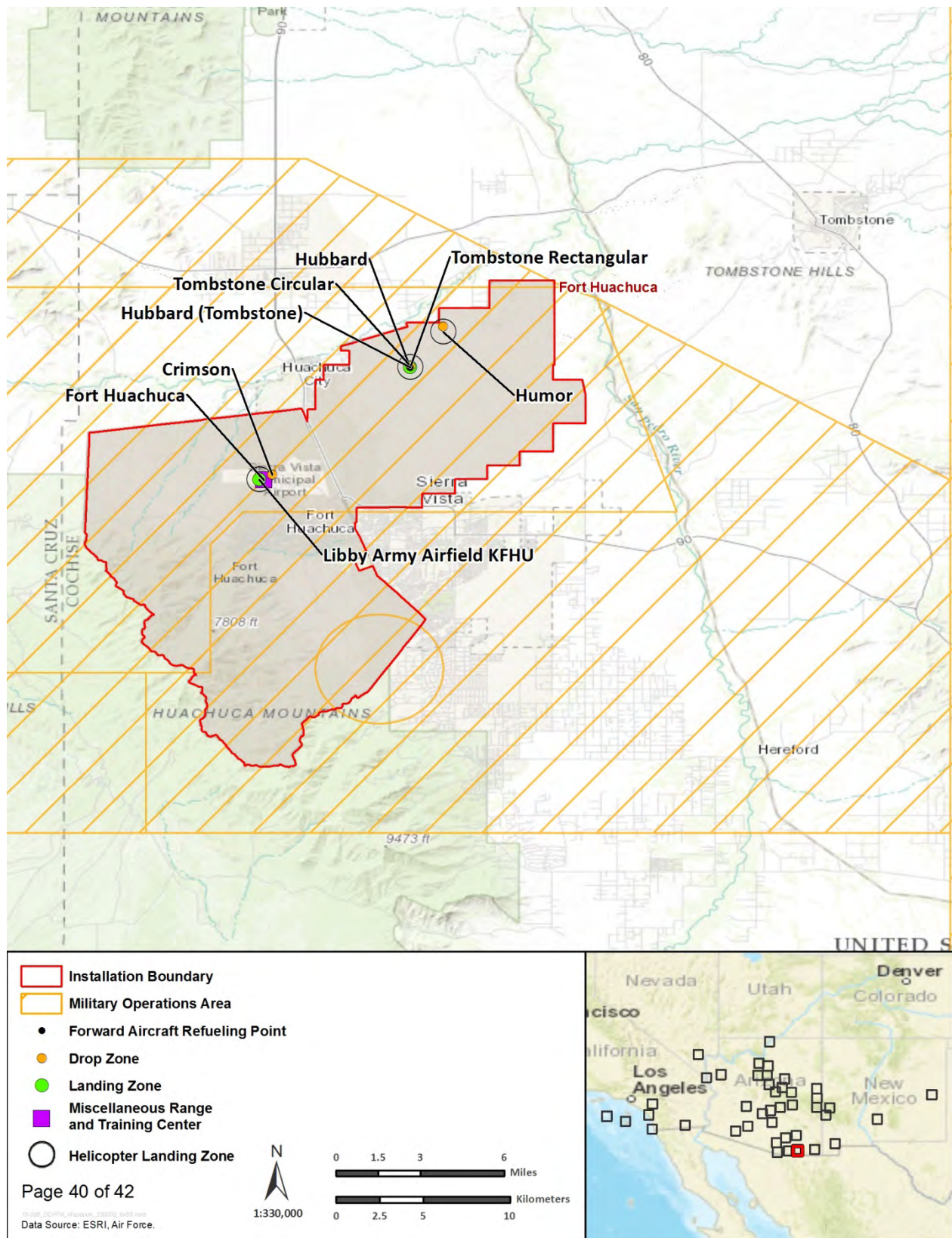


Figure C-42. Map 40 of 42

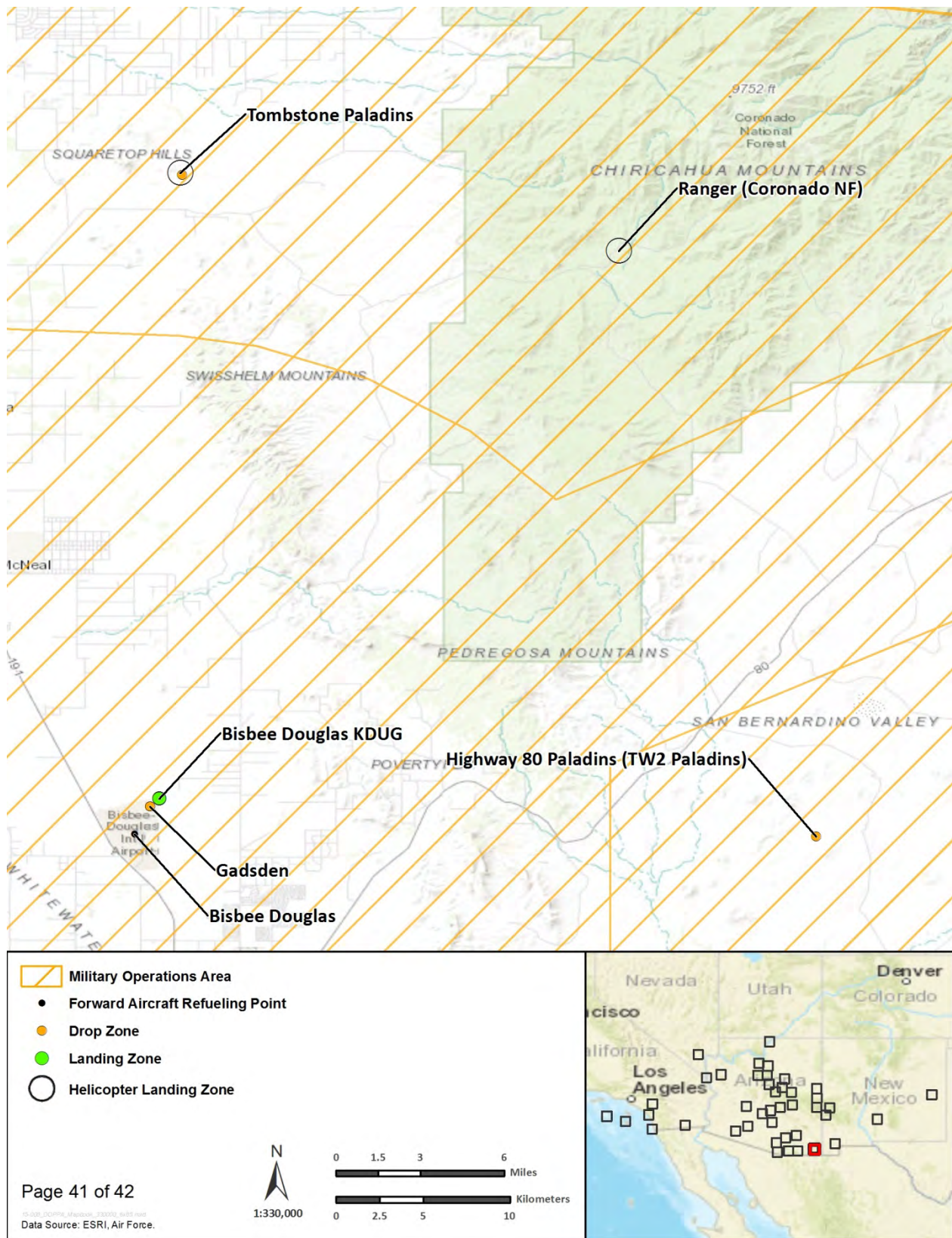


Figure C-43. Map 41 of 42

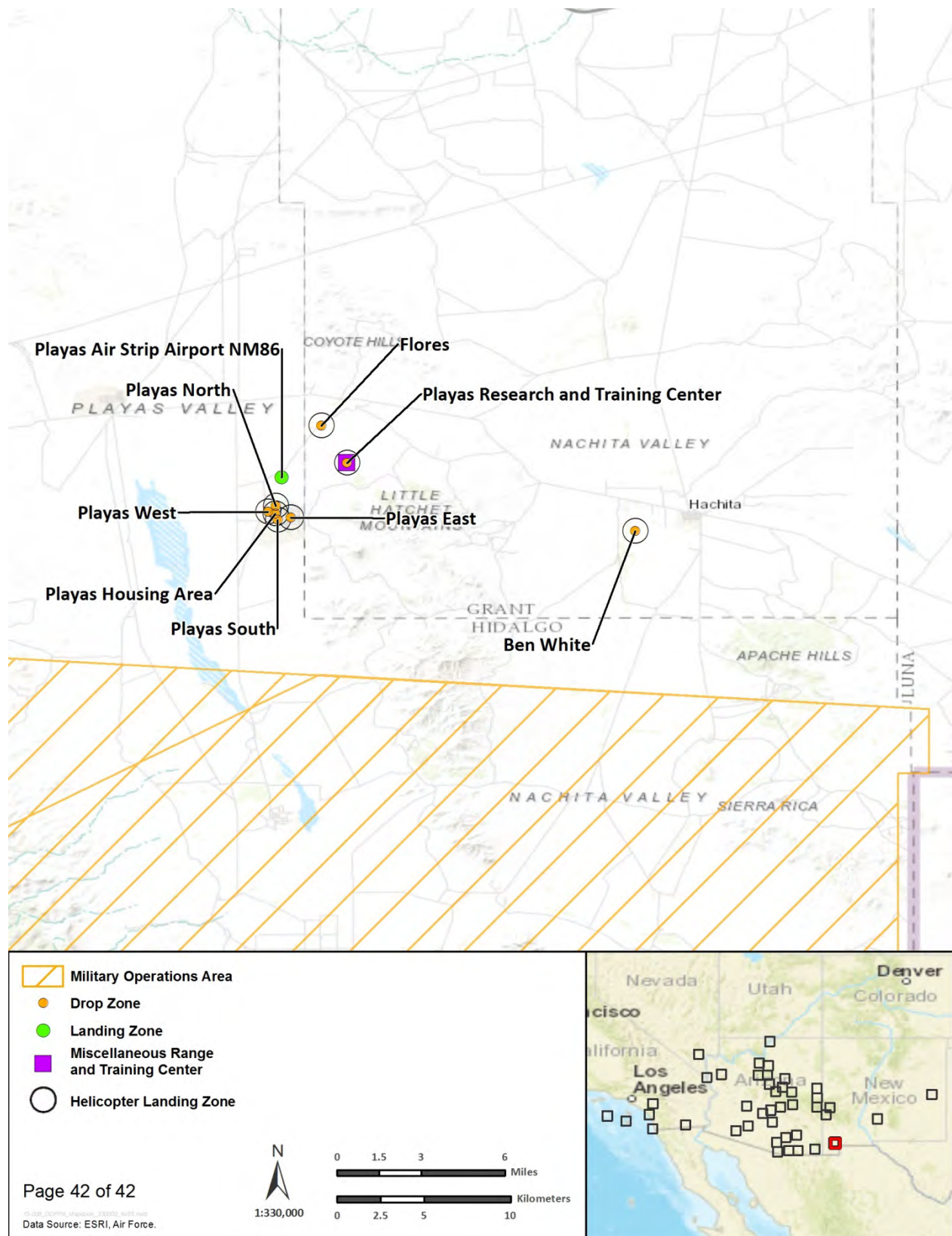
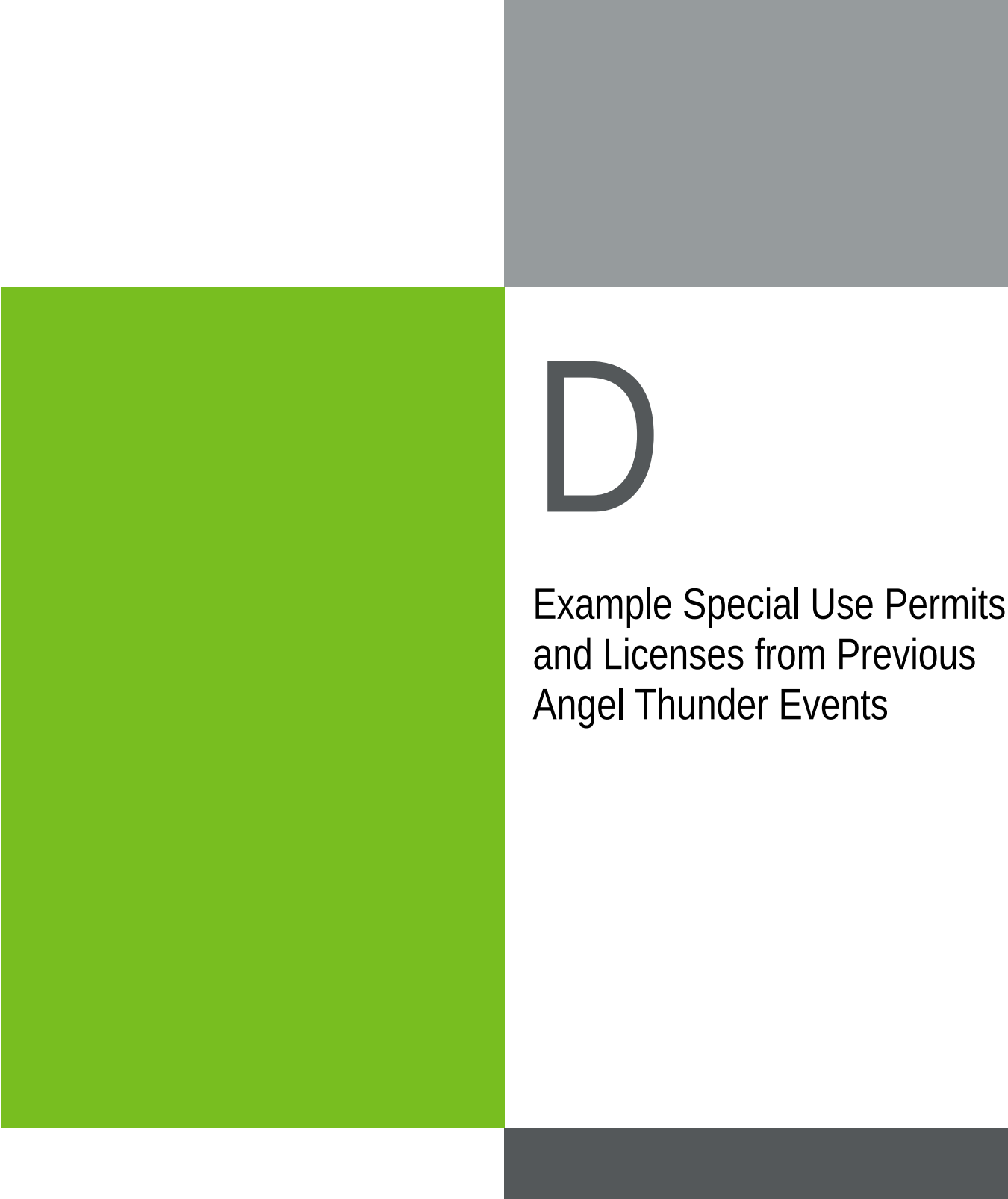


Figure C-44. Map 42 of 42



D

Example Special Use Permits
and Licenses from Previous
Angel Thunder Events

Appendix D: Example Special Use Permits and Licenses from Previous Angel Thunder Events

MANEUVER LICENSE
BETWEEN
MR. JIMMY JOY
AND
UNITED STATES OF AMERICA

Location Name: Blue, AZ

Designated Use: Helicopter Landing Zone and Parachute Landing Zone

Date: 1 - 30 April 2013

FOR AND IN CONSIDERATION of the desire to assist the United States of America, in its military, emergency, and natural disaster response efforts, the undersigned, hereinafter called the LICENSOR, grants to the United States of America, hereinafter called the Government, at no cost, a maneuver license under the terms and conditions as described in this Agreement.

LICENSOR grants the Government the right to enter upon the lands as described below at any time within the following period: 1 April 2013 through 30 April 2013, in order to carry out training and operations for the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base.

Angel Thunder has designated a Helicopter Landing Zone and Parachute Landing Zone located on the property of Mr. Jimmy Joy. Description is the 1300 x 75 foot grass/dirt runway located N 33° 36.661 W 109° 6.896. Run way is located 1200 feet east of the main residence. AF IMT 4303 and AF IMT 3823 landing surveys submitted under name Joy HLZ and Joy DZ.

Construction in connection with the use of this site is not required. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings in and over this land may be involved as part of these military training operations. The property may be used for bivouac and logistical support only in an emergency situation or as described above.

Existing flight/use survey documents, photographs, and on-site reviews of the property were utilized to perform an environmental baseline study. If required by Federal or state law, for the purpose of this training exercise, the Government has the right to conduct any additional environmental studies on the property; HOWEVER, the Government shall contact the LICENSOR by requesting approval to perform any additional environmental studies.

If any action of the Government's employees or agents in the exercise of this license results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the LICENSOR. In no event shall such repair imply that Congress will at a later date appropriate funds sufficient to meet any other deficiencies. The Government will hold and indemnify the LICENSOR if there is a lawsuit due

to their operations. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this license shall be needed to make a claim under applicable laws for any damages other than those provided herein.

The LICENSOR shall not be responsible or liable for injuries to person or damage to property when such injuries or damage are caused by or result from the Government's use of the premises under the terms of this agreement and are not due to the negligence of the LICENSOR.

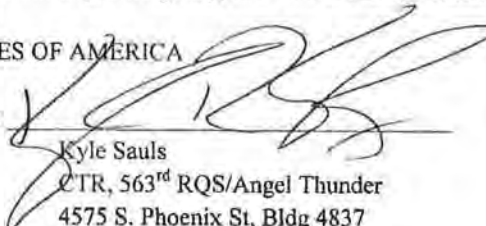
This permit may be terminated by either party upon 30 days written notice.

Notice of Termination or Claims shall be mailed to the Government at the address noted below and to the LICENSOR at the address shown hereon.

The men and women involved in Exercise Angel Thunder thank you for your cooperation and contribution to its military, emergency, and natural disaster readiness training.

UNITED STATES OF AMERICA

Represented By:


Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

Date: 03/30/2013

LICENSOR:

Mr. Jimmy Joy

Email:

Phone: 928 339-4404

Signature:



Date:

3/30/2013

MANEUVER LICENSE
BETWEEN
MR. OTIS WOLKINS
AND
UNITED STATES OF AMERICA

Location Name: Blue, AZ

Designated Use: Helicopter Landing Zone and Parachute Landing Zone

Date: 1 - 30 April 2013

FOR AND IN CONSIDERATION of the desire to assist the United States of America, in its military, emergency, and natural disaster response efforts, the undersigned, hereinafter called the LICENSOR, grants to the United States of America, hereinafter called the Government, at no cost, a maneuver license under the terms and conditions as described in this Agreement.

LICENSOR grants the Government the right to enter upon the lands as described below at any time within the following period: 1 April 2013 through 30 April 2013, in order to carry out training and operations for the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base.

Angel Thunder has designated a Helicopter Landing Zone and Parachute Landing Zone located on the property of Mr. Otis Wolkins. Description is the 1100 x 70 foot grass/dirt runway located N 33° 31.105 W 109° 12.706. Run way is located 1000 feet north of the main residence. AF IMT 4303 and AF IMT 3823 landing surveys submitted under name Otis HLZ and Otis DZ.

Construction in connection with the use of this site is not required. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings in and over this land may be involved as part of these military training operations. The property may be used for bivouac and logistical support only in an emergency situation or as described above.

Existing flight/use survey documents, photographs, and on-site reviews of the property were utilized to perform an environmental baseline study. If required by Federal or state law, for the purpose of this training exercise, the Government has the right to conduct any additional environmental studies on the property; HOWEVER, the Government shall contact the LICENSOR by requesting approval to perform any additional environmental studies.

If any action of the Government's employees or agents in the exercise of this license results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the LICENSOR. In no event shall such repair imply that Congress will at a later date appropriate funds sufficient to meet any other deficiencies. The Government will hold and indemnify the LICENSOR if there is a lawsuit due

to their operations. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this license shall be needed to make a claim under applicable laws for any damages other than those provided herein.

The LICENSOR shall not be responsible or liable for injuries to person or damage to property when such injuries or damage are caused by or result from the Government's use of the premises under the terms of this agreement and are not due to the negligence of the LICENSOR.

This permit may be terminated by either party upon 30 days written notice.

Notice of Termination or Claims shall be mailed to the Government at the address noted below and to the LICENSOR at the address shown hereon.

The men and women involved in Exercise Angel Thunder thank you for your cooperation and contribution to its military, emergency, and natural disaster readiness training.

UNITED STATES OF AMERICA

Represented By:


Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

Date: 03/27/2013

LICENSOR:

Mr. Otis Wolkins

Email: jwolkins@frontiernet.net

Phone: 928 339-4801

Signature: //Signed// Mr. Otis Wolkins

Date: 03/27/2013

MANEUVER LICENSE
BETWEEN
UNIVERSITY MEDICAL CENTER CORPORATION
AND
UNITED STATES OF AMERICA

Location Name: Tucson, AZ

Designated Use: Helicopter Landing Zone

Date: 1 - 30 April 2013

FOR AND IN CONSIDERATION of the desire to assist the United States of America, in its military, emergency, and natural disaster response efforts, the undersigned, hereinafter called the **LICENSOR**, grants to the United States of America, hereinafter called the **Government**, at no cost, a maneuver license under the terms and conditions as described in this Agreement.

LICENSOR grants the **Government** the right to enter upon the lands as described below at any time within the following period: 1 April 2013 through 30 April 2013, in order to carry out training and operations for the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base.

Angel Thunder has designated a Helicopter Landing Zone located on the roof of University of Arizona Medical Center-University Campus in Tucson, AZ. Description is the 50 x 50 foot roof top located N 32° 14 30.52 W 110° 56 48.39. AF IMT 4303 Helicopter Landing Zone exists under the name UMC HLZ.

Construction in connection with the use of this site is not required. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings in and over this land may be involved as part of these military training operations. The property may be used for bivouac and logistical support only in an emergency situation or as described above.

Existing flight/use survey documents, photographs, and on-site reviews of the property were utilized to perform an environmental baseline study. If required by Federal or state law, for the purpose of this training exercise, the **Government** has the right to conduct any additional environmental studies on the property; **HOWEVER**, the **Government** shall contact the **LICENSOR** by requesting approval to perform any additional environmental studies.

If any action of the **Government's** employees or agents in the exercise of this license results in damage to the real property, the **Government** will, in its sole discretion, either repair such damage or make an appropriate settlement with the **LICENSOR**. In no event shall such repair imply that Congress will at a later date appropriate funds sufficient to meet any other deficiencies. The **Government** will hold and indemnify the **LICENSOR** if there is a lawsuit due



United States
Department of
Agriculture

Forest
Service

Reserve Ranger District
Voice: 505.533.6231
FAX: 505.533.6605

P.O. Box 170
Reserve, NM 87830 - 0170
Internet: www.fs.fed.us/r3/gila/

File Code: 1590

Date: March 28, 2013

Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

Dear Mr. Sauls,

This letter authorizes the use of Negrito Airstrip on the Reserve Ranger District, Gila National Forest. The purpose of this authorization is to utilize the airstrip for helicopter and parachute landing zone, which is associated with the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base. The timeframe for this exercise will be from April 1, 2013 through April 30, 2013.

Authorization is to assist the United States of America for military, emergency and natural disaster response efforts. The designated location is at N 33° 31.672, W 108° 32.460 and includes a 1,500 X 500 yard area within an existing grass meadow. No construction within this area is needed nor authorized. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings may be involved as part of the training operations. The designated area may be used for bivouac and logistical support for emergency purposes.

If resource or real property damage occurs, it is expected that such damages would be appropriately mitigated to conditions prior to the exercise by Angel Thunder.

The Forest Service shall not be responsible or liable for injuries to person or damage to property when such injuries or damage are caused by or result from the use of the premises.

This authorization may be terminated by either party upon 30 days written notice.

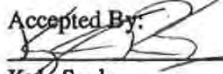
Sincerely,



JOHN D. PIERSON
District Ranger

UNITED STATES OF AMERICA

Accepted By:



Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

Date: 03/28/2013



Caring for the Land and Serving People

Printed on Recycled Paper



MANEUVER LICENSE
BETWEEN
WHITE MOUNTAIN APACHE TRIBE
AND
UNITED STATES OF AMERICA

Location Name: Salt River Highway 60

Designated Use: Salt River HLZ

Date: 1 – 30 April 2013

FOR AND IN CONSIDERATION of the desire to assist the United States of America, in its military, emergency, and natural disaster response efforts, the undersigned, hereinafter called the LICENSOR, grants to the United States of America, hereinafter called the Government, at no cost, a maneuver license under the terms and conditions as described in this Agreement.

LICENSOR grants the Government the right to enter upon the lands as described below at any time within the following period: 1 Apr 2013 through 30 Apr 2013, in order to carry out training and operations for the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base.

Angel Thunder has designated a Helicopter Landing Zone located on the Salt River. Description is the 75 x 75 foot rock surface located N 33° 47.912 W 110° 30.116. HLZ is located North Side of the Salt River. AF IMT 4303 Helicopter Landing Zone survey submitted under name Salt River HLZ.

Construction in connection with the use of this site is not required. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings in and over this land may be involved as part of these military training operations. The property may be used for bivouac and logistical support only in an emergency situation or as described above.

Existing flight/use survey documents, photographs, and on-site reviews of the property were utilized to perform an environmental baseline study. If required by Federal or state law, for the purpose of this training exercise, the Government has the right to conduct any additional environmental studies on the property; HOWEVER, the Government shall contact the LICENSOR by requesting approval to perform any additional environmental studies.

If any action of the Government's employees or agents in the exercise of this license results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the LICENSOR. In no event shall such repair imply that Congress will at a later date appropriate funds sufficient to meet any other deficiencies. The Government will hold and indemnify the LICENSOR if there is a lawsuit due

to their operations. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this license shall be needed to make a claim under applicable laws for any damages other than those provided herein.

The LICENSOR shall not be responsible or liable for injuries to person or damage to property when such injuries or damage are caused by or result from the Government's use of the premises under the terms of this agreement and are not due to the negligence of the LICENSOR.

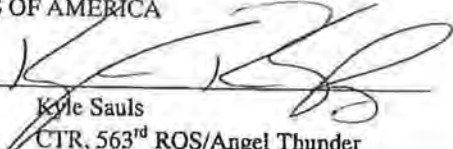
This permit may be terminated by either party upon 30 days written notice.

Notice of Termination or Claims shall be mailed to the Government at the address noted below and to the LICENSOR at the address shown herein.

The men and women involved in Exercise Angel Thunder thank you for your cooperation and contribution to its military, emergency, and natural disaster readiness training.

UNITED STATES OF AMERICA

Represented By:

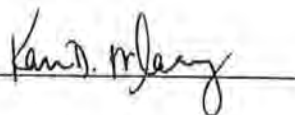

Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

Date: 03/29/2013

LICENSOR:

University Medical Center Corporation
c/o Karen Mlawsky, CEO
1501 North Campbell Ave
Tucson, AZ 85724
Email: kknak@umcaz.edu
Phone: 520 694-4495

Signature:



Date:

3/29/13

MANEUVER LICENSE
BETWEEN
APACHE-SITGREAVES NATIONAL FOREST
AND
UNITED STATES OF AMERICA

Location Name: Alpine, AZ

Designated Use: Helicopter Landing Zone and Parachute Landing Zone

Date: 1 - 30 April 2013

FOR AND IN CONSIDERATION of the desire to assist the United States of America, in its military, emergency, and natural disaster response efforts, the undersigned, hereinafter called the **LICENSOR**, grants to the United States of America, hereinafter called the Government, at no cost, a maneuver license under the terms and conditions as described in this Agreement.

LICENSOR grants the Government the right to enter upon the lands as described below at any time within the following period: 1 April 2013 through 30 April 2013, in order to carry out training and operations for the Angel Thunder Training Exercise, hosted by Davis-Monthan Air Force Base.

Angel Thunder has designated a Helicopter Landing Zone and Parachute Landing Zone located in Caldwell meadow in the Apache-Sitgreaves National Forest. Description is the 2000 x 500 yard grass meadow located N 33° 45.656 W 109° 23.24. AF IMT 4303 and AF IMT 3823 landing surveys submitted under name Caldwell Cabin HLZ and Caldwell Cabin DZ.

Construction in connection with the use of this site is not required. The use of military equipment, wheeled vehicles, aircraft, aircraft flights and/or landings in and over this land may be involved as part of these military training operations. The property may be used for bivouac and logistical support only in an emergency situation or as described above.

Existing flight/use survey documents, photographs, and on-site reviews of the property were utilized to perform an environmental baseline study. If required by Federal or state law, for the purpose of this training exercise, the Government has the right to conduct any additional environmental studies on the property; HOWEVER, the Government shall contact the **LICENSOR** by requesting approval to perform any additional environmental studies.

If any action of the Government's employees or agents in the exercise of this license results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the **LICENSOR**. In no event shall such repair imply that Congress will at a later date appropriate funds sufficient to meet any other deficiencies. The Government will hold and indemnify the **LICENSOR** if there is a lawsuit due

to their operations. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this license shall be needed to make a claim under applicable laws for any damages other than those provided herein.

The LICENSOR shall not be responsible or liable for injuries to person or damage to property when such injuries or damage are caused by or result from the Government's use of the premises under the terms of this agreement and are not due to the negligence of the LICENSOR.

This permit may be terminated by either party upon 30 days written notice.

Notice of Termination or Claims shall be mailed to the Government at the address noted below and to the LICENSOR at the address shown hereon.

The men and women involved in Exercise Angel Thunder thank you for your cooperation and contribution to its military, emergency, and natural disaster readiness training.

UNITED STATES OF AMERICA

Represented By: _____ Date: _____

Kyle Sauls
CTR, 563rd RQS/Angel Thunder
4575 S. Phoenix St, Bldg 4837
Davis-Monthan AFB, AZ 85707

LICENSOR:

Mr. Richard Davalos, District Ranger
PO Box 469
Alpine, AZ 85920
Email: rdavalos@fs.fed.us
Phone: 928 339-5010

Signature: *Richard Davalos*

Date: 4/4/2013

Authorization ID: _____
Use Code: _____
Expiration Date: _____

FS-2700-3b (10/09)
OMB No. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE SPECIAL USE PERMIT FOR NONCOMMERCIAL GROUP USE (Ref.: 36 CFR 251.54) Authority: Organic Act of 1897, 16 U.S.C. 551	Forest Service Use Code: 191
	Date Received _____ Application: Granted _____ Denied _____
	_____ Date _____

PART I - APPLICATION

1. APPLICANT INFORMATION:

Name of Group or Event: _____ US Air Force Exercise ANGEL THUNDER _____

Address of Group or Contact: _____ 4575 S Phoenix St, Bldg 4837, Davis-Monthan AFB AZ, 85707 _____

Name of Contact: _____ Maj Sarah Schwennesen _____

The contact shall be available to the Forest Service from the date this application is signed until it is accepted, rejected, or denied.

Phone: 520 228 4452 Cell: 520 444 4561 E-mail Address: sarah.schwennesen@us.af.mil

2. DESCRIPTION OF PROPOSED ACTIVITY:

Parachute U.S. Air Force Pararescue men to Mogollon Rim, in order to 'rescue' mannequins that are simulated injured personnel off of the side of the rim. Once the 'bodies' are rescued, then land U.S. Air Force helicopters to retrieve Pararescue personnel.

Indicate if any of the following will be part of the activity:

☐ATV's ☐Livestock ☐Firearms ☐Rifles ☐Shotguns ☐Black Powder ☐Pistols ☐Paintball ☐Archery

3. LOCATION & DESCRIPTION OF NATIONAL FOREST SYSTEM LANDS & FACILITIES APPLICANT WOULD LIKE TO USE:

Mogollon Rim

4. ESTIMATED NUMBER OF PARTICIPANTS & SPECTATORS FOR PROPOSED ACTIVITY:

Participants: 10 Spectators: 10

5. STARTING & ENDING DATE & TIME OF PROPOSED ACTIVITY:

Start Date: 12 May Time: 8 am End Date: 12 May Time: 3 pm

6. NAME OF PERSONS WHO WILL SIGN A SPECIAL USE PERMIT ON BEHALF OF THE GROUP (May be same as contact listed in item 1.):

Printed Name: Sarah Schwennesen Printed Name: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

APPLICATION NOT VALID UNLESS SIGNED BY CONTACT

Signature of Contact _____ Date: _____

18 U.S.C. § 1001 makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction. Anyone who knowingly or willfully makes or uses any false writing

shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

PART II - PERMIT (To Be Filled Out By Forest Service)

Purpose:

Noncommercial group use permits do not grant or deny freedom of assembly or freedom of speech. The rights to freedom of assembly and freedom of speech are guaranteed by the United States Constitution. These rights are fully respected by the Forest Service. When noncommercial group use permits are issued, they regulate time, place, and manner with respect to the exercise of these rights by groups of 75 or more people on National Forest System lands. Noncommercial group use permits authorize the holder to use and occupy the National Forest System lands covered by the permit, subject to rights retained by the United States, including continuing rights of access, a continuing right of physical entry for inspection, monitoring, or for any other purposes consistent with any right or obligation of the United States, and the right to require common use of the land or to authorize use by others in any way that is not inconsistent with the privileges granted by the permit. The use and occupancy authorized by a noncommercial group use permit would not be allowed without the permit. The primary purposes of noncommercial group use permits include protection of National Forest System lands and resources, promotion of public health and safety, and allocation of space among competing uses of National Forest System lands.

1. Use under this permit shall begin on _____ at _____ and end on _____ at _____. The permit shall not be extended.

2. _____ (the holder) is hereby authorized to use, subject to the terms of this permit, National Forest System lands described as _____, as shown on the attached Exhibit A (Map). This permit covers approximately _____ acres and/or _____ miles.

3. The holder is authorized to conduct the following activities and install the following improvements in the permitted area:

4. The holder shall conduct the authorized activities according to the attached approved plans and specifications, Exhibit B (Operating Plan). The holder shall not install any improvements not specifically identified and approved in clause 3, in exhibits attached to this permit, or by the authorized officer during the activity authorized by this permit.

5. No soil, trees, or other vegetation may be destroyed or removed from National Forest System lands without specific prior written permission from the authorized officer.

6. The holder shall comply with all federal, state, county, and municipal laws, ordinances, and regulations which are applicable to the area or operations covered by this permit.

7. The holder shall maintain the improvements and premises to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer. The holder shall fully repair and bear the expense for all damages, other than ordinary wear and tear, to National Forest System lands, roads and trails caused by the holder's activities.

8. The holder has the responsibility of inspecting the use area and adjoining areas for dangerous trees, hanging limbs, and other evidence of hazardous conditions which would pose a risk of injury to individuals. After securing permission from the authorized officer, the holder shall remove such hazards.

9. The holder shall be liable for any injury, loss, or damage, including fire suppression costs and environmental harm or injury to natural resources, that arises in connection with the use and occupancy authorized by this permit.

10. The holder shall indemnify and hold harmless the United States for any injury, loss, or damage, including third-party claims, damage to federal property, fire suppression costs, and environmental harm or injury to natural resources, that arises in connection with the use and occupancy authorized by this permit.

11. The persons who sign this permit are not subject to any individual liability under this permit as a result of that signature. They provide their name solely to allow notice of actions pertaining to the permit to be communicated to the holder and to give the permit legal effect. At least one of the persons who sign this permit shall be available to the Forest Service from the date this permit is issued until the use authorized by this permit has concluded.

12. The holder agrees to permit free and unrestricted access to and upon the premises at all times for all lawful and proper purposes not inconsistent with the intent of the permit or with the reasonable exercise and enjoyment by the holder of the privileges thereof.

13. This permit is subject to all valid existing rights and claims outstanding in third parties.

14. This authorization may be revoked or suspended only in accordance with 36 CFR 251.60(a)(1)(i). Upon expiration or revocation of this permit, the holder shall immediately remove all improvements except those owned by the United States, and shall restore the site within days, unless otherwise agreed upon in writing. If the holder fails to remove the improvements, they shall become the property of the United States, but that will not relieve the holder of liability for the cost of their removal and the restoration of the site.

15. This permit is a license for the use of federally owned land. It does not grant any interest in real property. This permit is not transferable. The holder shall not enter into any agreements with third parties for occupancy of the authorized premises and improvements.

16. Any decision concerning this permit, including but not limited to suspension or revocation and modification of permit terms and conditions, is not subject to administrative appeal and is immediately subject to judicial review.

17. This permit is accepted subject to the conditions set forth herein, including any conditions in any exhibits attached to and made a part of this permit.

18. The above clauses shall control if they conflict with additional clauses or provisions.

19. Cultural Resources Protection (D001RO). The holder, contractor, or lessee shall be responsible for the protection from damage of all identified cultural resources within the area which may be affected by their actions. In addition, the holder, contractor, or lessee shall be liable for all damage or injury to the identified cultural resources caused by their actions. The holder, contractor, or lessee shall immediately notify the agency Project Administrator if any damage occurs to any cultural resource and immediately halt work in the area in which damage has occurred until approval to proceed has been granted by the Project Administrator after consultation with the Forest Archeologist. All provisions of the Region 3 Cultural Resources Damage Assessment Handbook are incorporated by reference herein.

20. Native American Grave Protection and Repatriation Act (X003RO). Pursuant to the Native American Grave Protection and Repatriation Act (NAGPRA) 25 USC 3002(d); 43 CFR Part 10.4, if any human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during the course of ground disturbing activity, the holder will immediately cease activity in the area of the discovery and will make a reasonable effort to protect the remains and objects. The holder will provide immediate telephone notification of the discovery to the Forest Service, and will follow up with written confirmation to the authorized officer. The holder will not resume the activity that resulted in the discovery until the authorized officer gives written approval. Approval to resume the activity, if otherwise lawful, will be given thirty (30) days after certification by the authorized officer of the holder's written confirmation of the discovery, or at any time that a written binding agreement is executed between the Forest Service

and the affiliated tribes adopting a recovery plan for the remains and objects.

21. **SIGNING:** Use plywood and remove when leaving the area. Do not use paper plates. Do not attach signs to trees or Forest Service signs.

22. **SOLID WASTE REQUIREMENTS:** Place garbage into containers as it is generated. Remove all trash and debris from the area and dispose in a proper manner, such as a landfill or County transfer stations located in Heber or Forest Lakes.

23. **SANITATION REQUIREMENTS:** Use chemical latrines and/or other facilities which might be available.

24. **CAMPFIRES:** Must comply with any campfire restriction in effect. Check with the Black Mesa Ranger District (928) 535-7300 just prior to activity. Fires must be attended to at all times.

25. **SPECIAL INSTRUCTIONS/RESTRICTIONS:** This permit does not reserve the area for exclusive use. It is merely a means of contacting groups and coordinating group use of the area.

26. **HORSE GROUPS:** No grazing allowed. Provide weed free hay. Break up and scatter horse manure and fill in pawed holes. Scatter a covering of needles and cones over the site. Picket or highline horses away from trees.

I have read and understand the terms and conditions
and agree to abide by them.

U.S. DEPARTMENT OF AGRICULTURE Forest Service

Authorization is granted:

HOLDER:

By: _____

By: _____

Holder Name: _____

Name: Christopher James

Title: _____

Title: District Ranger

Date: _____

Date: _____

**HOLDER MUST HAVE THIS PERMIT (OR A LEGIBLE COPY) IN POSSESSION
DURING THE AUTHORIZED ACTIVITY**

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond, to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

EXHIBIT B - OPERATING PLAN for _____

This operating plan is hereby incorporated as part of the authorization in accordance with clause 4 of the Special-Use Application and Permit for Non Commercial Group Use (FS-2700-3b), if the proposal is accepted and the application is approved.

1. Toilet Facilities. One Portable Toilet is required for every 20 people. (Per OSHA standard 29 CFR 1310.142(d) and Forest Service Handbook 6709.11) Portable Toilets may not be delivered to the site earlier than one day before the event and must be removed the day after the event.

Name of Company providing Portable Toilets _____ Number of Toilets Needed: _____

2. Improvements and Structures. Construction of any improvements and/or structures on the site requires prior approval of the Forest Officer. Approval is granted for the following structure(s) or improvement(s):

3. Trash and Litter. Place garbage into containers as it is generated. Remove all trash and debris from the site and dispose in an approved landfill or transfer station. Dumpsters in Forest Service developed campgrounds and recreation areas are not available for use by permit holder.

4. Vehicles and Vehicle Use. Horizontally numbered road signs, such as 169, including State highways and county roads that are within the boundaries of the National Forest lands within the Apache-Sitgreaves National Forest, require that the vehicle and its' operator meet all state licensing, registration and safety equipment requirements. ATVs are required to be "Street Legal" on these roads. State law does not apply on vertically numbered road signs, or primitive (undeveloped) roads. Citations can be issued for resource damage to soils, vegetation, and roads. It is the holder's responsibility for their group to abide by any restrictions and promote safe and responsible operation of vehicles. Holder will avoid rutting of roads and meadows, and will minimize any off-road vehicular use. At camp closure there will be little evidence of occupancy.

5. Firearms. It is prohibited to discharge a firearm or any other implement capable of taking human life, causing injury, or damaging property; (1) In or within 150 yards of a residence, building, campsite, developed recreation site, or occupied area. (2) Across or on a Forest development road or a body of water adjacent thereto, or in any manner or place whereby any person or property is exposed to injury or damage as a result in such discharge. (3) Into or within any cave 36CFR261.10 (d). Shooting activities are preferred in pits, or in front of slopes or mountain sides with a minimum amount of trees. No shooting will take place one half-hour before sunrise or one half- hour after sunset.

6. Developed Recreation Sites. All developed recreation sites and administrative sites are excluded from use. This includes, but is not limited to developed campgrounds, day use areas, trailheads, cabins, and corrals. Use of these facilities requires approval of the Forest Officer. Approval is granted for the use of the following government facility(s):

7. Signs. Signs indicating direction or location of group camp or event are restricted to Two (2) signs. Signs must be professional in appearance and self supporting. The name of the group or representative with a telephone number must be on sign(s) in legible characters and no less than ¼ inches in height. Signs are not permitted on trees or vegetation, any post, pole, or other signs on Forest lands. Signs without this information (ex: paper plates, scrap cardboard, or flagging) are subject to removal and a citation. Signs are to be removed when activity is finished.

8. Food Storage. Possessing, storing, or discarding any food or refuse in an exposed or physically available condition to wildlife is prohibited (Forest Order 01-457).

9. Clean Up. Time frame to remove all facilities and garbage after the event (including removal of signs, advertising flagging, route markers, Portable Toilets): **Required: One day after the conclusion of the event.**

10. Gray Water. Gray water will be collected in buckets, screened and water scattered. Screened material will be taken off site with garbage.

ACCEPTED: Permit Holder: _____ Date: _____

Local Portable Toilet Vendors

This information is provided as a courtesy.
This is may not be a complete list of all the Portable Toilet Vendors that service the area.

Banana Jons	Show Low	(928) 532-3146
Atteberry Septic & Portable Toilets	Show Low	(928) 242-2802
Cheap Seats	Heber/Overgaard	(928) 535-4654

- **One Portable toilet is required for every 20 people.** (Per OSHA standard 29 CFR 1910.142(d) and Forest Service Handbook 6709.11)
- Company Name and Phone Number of Vendor Providing Portable toilet Services must be recorded on group's Operating Plan.
- Portable toilets may not be delivered to the site any earlier than 1 day before the event.
- Portable toilets must be **Removed no later than 1 day after the event.** It is the permit holders' responsibility to ensure that the Portable toilets were removed as planned.
- Groups not complying with these requirements are subject to citations.

Rules to Follow While Visiting your National Forest

As a visitor to the National Forests, you are asked to follow certain rules designed to ensure a quality experience for all forest visitors. You are primarily responsible for your own safety. Recreation in the outdoors has inherent risks. Many forest locations are remote and emergency assistance may not be readily available.

Campfires

- Obey restrictions on fires. Open fires may be limited or prohibited at certain times.
- Within campgrounds and other recreation sites, build fires only in fire rings, stoves, grills or fireplaces provided for that purpose.
- Be sure your fire is completely extinguished before leaving. You are responsible for keeping fires under control.

Property

- Do not carve, chop, cut, or damage any live trees.
- Preserve and protect your National Forests. Leave natural areas the way you found them.
- Native American sites, old cabins, and other structures, along with objects and artifacts associated with them, have historical or archaeological value. Do not damage or remove any such historic or archaeological resource.

Sanitation

- Take all garbage home with you.
- Wash food and personal items away from drinking water supplies. Use water facilities only for drawing water.
- Prevent pollution by keeping garbage, litter, and foreign substances out of lakes, streams and other water.

Operation of Vehicles

- Obey all traffic signs. State traffic laws apply to National Forests unless otherwise specified.
- When operating vehicles of any kind, do not damage the land or vegetation or disturb wildlife. Avoid driving on unpaved roads or trails when they are wet or muddy, causing deep ruts. Within campgrounds and other recreation sites, use cars, motorbikes, motorcycles, or other motor vehicles only for entering or leaving, unless areas or trails are specifically marked for them. Park only in marked parking areas.
- Do not block, restrict, or interfere with the use of roads or trails.
- Obey area and trail restrictions on the use of trail bikes and other off-the-road vehicles.

Pets and Animals

- Pets must always be restrained or on a leash while in developed recreation sites.
- Saddle or pack animals are allowed in recreation sites only where authorized by posted instructions.

Firearms and Explosives

- Fireworks and explosives are prohibited in the National Forests. Only persons with a permit from the Forest Service may engage in these types of activities.
- Firing a gun is not allowed: a) in or within 150 yards of a residence, building, campsite, developed recreation site or occupied area; b) across or on a road or body of water; c) in any circumstance whereby any person may be injured or property damaged.

Public Behavior

- No fighting or boisterous behavior.
- Keep noise to a reasonable level. Please be considerate of fellow visitors.

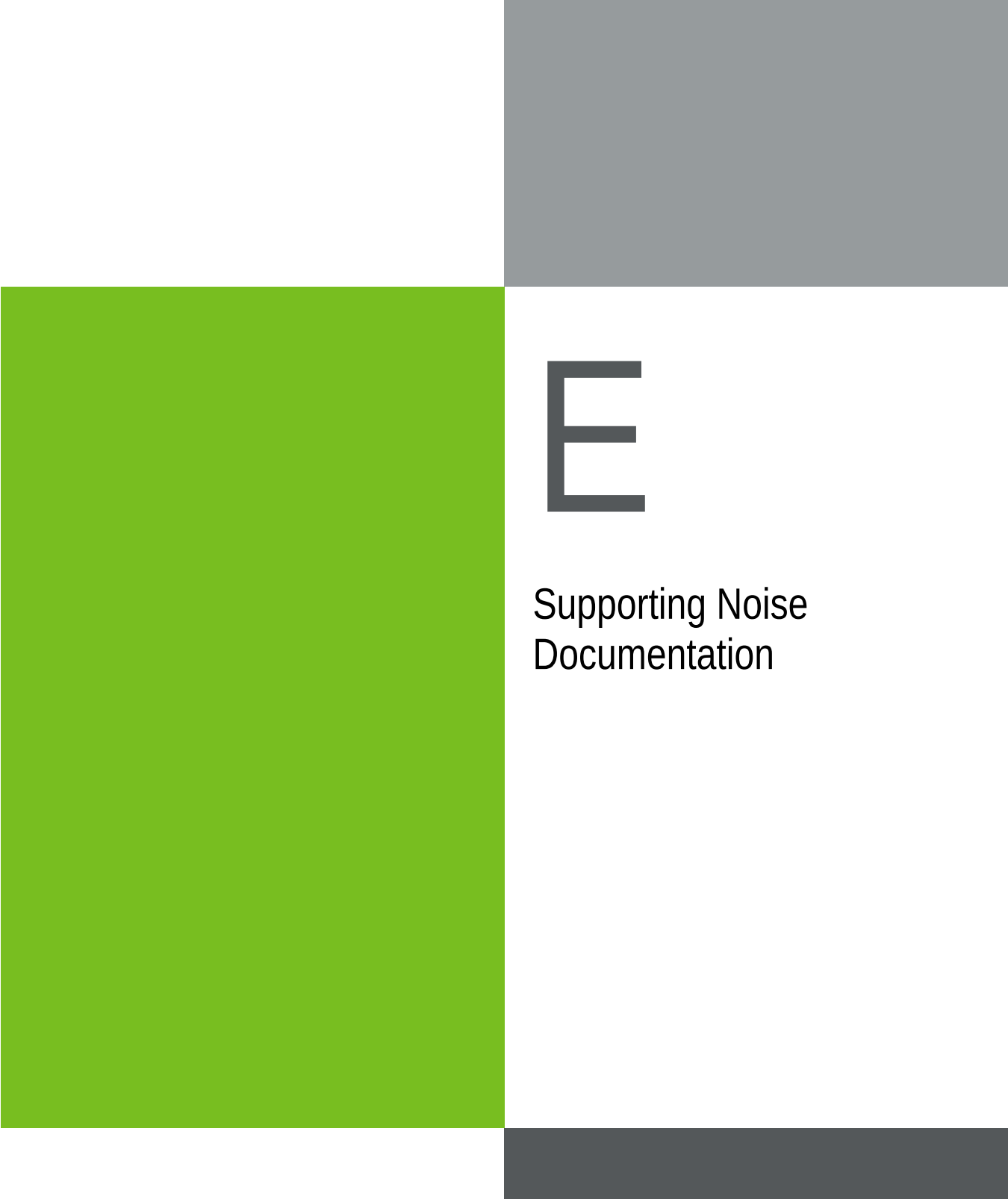
Business Activities

- Permits are required for any commercial activity on National Forest lands.

Audio Devices

- Operate any audio device, such as a radio or musical instrument, so it does not disturb other visitors.
- A permit is required for a public address system used in or near a campsite, developed recreation site, or over a body of water.

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E

Supporting Noise
Documentation

Appendix E: Supporting Noise Documentation

E.1 Introduction

This Noise Modeling Technical Appendix is in support of the EA Addressing the Angel Thunder (AT) Personnel Recovery (PR) Training Exercise at Davis-Monthan Air Force Base (AFB), Arizona. Specifically, the appendix documents the baseline aircraft operations and noise, the aircraft operations and noise both with and without the proposed biannual AT exercises. The aircraft operations and noise are primarily based on the 2008 Davis-Monthan AFB Draft Air Installation Compatible Use Zone (AICUZ) Study (Davis-Monthan AFB 2008) as a comparative baseline to assess the environmental impacts under the National Environmental Policy Act (NEPA).

The USAF adopted the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is a suite of computer programs and components developed by the USAF to predict noise exposure in the vicinity of an airfield due to aircraft flight, maintenance, and ground run-up operations. NOISEMAP Version 7.3 was used to calculate and plot the DNL noise contours based on the average daily aircraft operations data collected in 2008 as described in Subsections E.2 through E.6.

The noise contours, shown within, depict 2008 operational conditions and are consistent with the most recent Air Installation Compatible Use Zone (AICUZ) study at the base. This is the best available information at this time, and has been carried forward as a comparative baseline to determine the effects under NEPA. The overall operations at Davis-Monthan AFB due to the AT exercises make up a small fraction of the overall operations and changes would have a minute effect on any noise surrounding the base. Additional data collection, or updates to the 2008 noise contours would not provide any additional information that would better clarify the incremental effects of the proposed action.

Analysis of Davis-Monthan AFB's operations using NOISEMAP included aircraft types, flight patterns, variations in altitude, power settings, number of operations, and hours of operations. These data were supplemented by flight track, flight profile, and ground run-up information. The air operational data was collected and verified during the 2008 AICUZ process, and were input into the NOISEMAP Version 7.3 computer program to produce noise contour maps. Air operational data and subsequent noise exposure maps both with and without the proposed AT exercise were verified and approved by AT personnel and the Air Force Civil Engineer Center (AFCEC) during the 2008 AICUZ process. This technical appendix provides an overview of the noise modeling procedures and inputs into NOISEMAP, including aircraft operations, runway and flight track utilization, ground run-up information, flight profiles, and weather.

E.2 Aircraft Operations

Aircraft operational data from the 2008 AICUZ were updated to reflect annual average operations and to provide a basis of the noise assessment. **Table E-1** summarizes the projected average daily aircraft operations for Davis-Monthan AFB. Notably, an aircraft operation is defined as one takeoff/departure, one approach/landing, or half of a closed pattern. A closed pattern consists of two portions, a takeoff/departure and an approach/landing (i.e., two operations).

Table E-1. Average Daily Aircraft Operations at Davis-Monthan Air Force Base

Aircraft Type	Average Daily Operations		
	Arrival/Departure	Closed Pattern	Total
Based Aircraft			
A-10	69.53	0.00	69.53
AS-350 A-stars	22.67	0.23	22.90
C-130	6.21	10.25	16.46
Cessna 210	0.40	0.00	0.40
Citation 550	4.00	0.10	4.10
F-15	0.13	0.00	0.13
F-16	18.33	0.00	18.33
F-4	0.38	0.00	0.38
GR-4	0.99	0.00	0.99
HH-60/UH-60	15.55	2.63	18.18
P-3	0.17	0.00	0.17
Total Based Aircraft	138.4	13.2	151.6
Transient Aircraft			
C-130E	1.15	0.00	1.15
C-5A	1.15	0.00	1.15
CESSNA-441 TPROP	9.95	0.00	9.95
COMPOS BUS JET	9.95	0.00	9.95
E-3A	1.15	0.00	1.15
F-16A	1.15	0.00	1.15
F-18A/C	1.15	0.00	1.15
KC-135R	1.15	0.00	1.15
P-3A	1.15	0.00	1.15
Total Transient Aircraft ¹	27.97	0.00	27.97
Base-Wide Operations¹	166.3	13.2	179.5
Angel Thunder Aircraft			
A-10	1.32	0.00	1.32
A-29	0.26	0.00	0.26
AH-64	0.53	0.00	0.53
B-212	0.13	0.00	0.13
C-130	0.92	0.00	0.92
CH-47	0.53	0.00	0.53
E-3	0.13	0.00	0.13
E-8	0.13	0.00	0.13
EC-725	0.26	0.00	0.26
HH-60/UH-60	1.84	0.00	1.84
MC-12	0.26	0.00	0.26
OV-10	0.26	0.00	0.26
Total Angel Thunder	6.58	0.00	6.58
Base-Wide Operations with Angel Thunder	172.9	13.2	186.1
Percent Change	3.9%	0.0%	3.7%

¹ Based on the 2008 AICUZ data converted to average annual day operations. This is the best available information at this time, and has been carried forward as a comparative baseline to determine the effects under NEPA.

In addition to the operations by home-based aircraft, over 100 types of transient military and civil aircraft conduct operations at the installation. The transient aircraft include fighter-type and other aircraft that deploy to Davis-Monthan AFB. The table reflects a total of 179.5 average daily operations without the proposed AT exercise, and 186.1 average daily operations including the proposed AT exercise. Approximately 7 percent of the operations occur at night (10:00 p.m. to 7:00 a.m.).

Although the number of military and civil aircraft operations at an installation usually varies from day to day, NOISEMAP requires input of the specific numbers of daily flight and aircraft run-up operations. Since the 2008 AICUZ Study at Davis-Monthan AFB, the U.S. Air Force (USAF) has begun to follow the Federal Aviation Administration's use of the "average annual day" in which annual operations are averaged over an entire 365-day year. The USAF no longer uses the "average busy-day" approach, as it does not represent the typical noise exposure.

Noise levels associated with the operation of UASs used in AT training are listed in **Table E-2**. Because of their relatively low levels of noise compared to other fixed-wing aircraft, they are not commonly accounted for in determining the impacts of training activity noise on communities and individuals living adjacent to airfields and LZs. The very small increase in the activity from changes in UAS operations would translate into negligible (i.e., not distinguishable from existing) changes in the overall noise environment.

Table E-2. Maximum Sound Level from Unmanned Aerial SystemsE

Slant Distance (feet)	Sound Levels of Unmanned Aerial System [dBA]	
	MQ-1 Predator	MQ-9 Reaper
200	92	85
500	84	76
1,000	78	70
2,000	71	64
5,000	61	54
10,000	55	48

Sources: USAF 1998 and USACHPPM 2002

Note: Overall sound level during run-up is used as a reasonable worst-case for in-flight operations.

In general, UASs normally operate at much higher altitudes and are used less frequently than helicopters. No changes to existing areas of incompatible land use would be generated due to changes in UAS operations at any military LZ. Because of the airspace restrictions and their limited levels of noise, no residences, communities, or sensitive noise receptors would experience any notable change to the overall noise environment due to changes in UAS activities.

E.3 Runway and Flight Track Utilization

The installation has one runway, Runway 12/30, which is constructed of concrete and is 13,643 feet long by 200 feet wide. The approach to Runway 12 is on the northwestern side of the airfield and the approach to Runway 30 is on the southeastern side of the airfield. The majority of the aircraft arriving and departing at the airfield utilize Runway 12 approximately

70 percent of the time and Runway 30 approximately 30 percent of the time. Runway use is driven by traffic flow at Tucson International Airport (IAP) as well as wind direction. Pilots prefer to take off and land facing into the wind. There is an area for helicopter landings, northwest of Runway 12, which is used by the 563rd Rescue Group (RQG), 943 RQG, and U.S. Customs and Border Protection. In addition, there is a helicopter training area west of Runway 12/30 and south of the control tower.

The flight patterns in **Figures E-1, E-2, and E-3** represent the way that aircraft arrive, depart, and perform closed-pattern operations at Davis-Monthan AFB. As shown in **Figures E-1 and E-2**, aircraft arrive and depart in numerous directions from Davis-Monthan AFB. The majority of the closed-pattern operations performed by aircraft are flown to the east of the airfield to avoid Tucson IAP airspace as shown in **Figure E-3**; however, helicopters fly closed patterns west of the airfield.

E.4 Aircraft Maintenance Run-up Operations

Maintenance engine run-ups occur at test cells and various locations around the airfield. Maintenance at Davis-Monthan AFB is typically performed in front of the hangar for each unit. A test cell is located east of Runway 12. Test cells are used to perform high power aircraft engine checks, typically after a maintenance procedure, to assess the operating condition and performance of the engine. Test cells can be located in unenclosed areas or in an enclosed space with the use of a suppressor to minimize noise. The test cell at Davis-Monthan AFB does not have a suppressor. Flying activities at the installation are conducted by numerous unit that include the 355th Fighter Wing (FW), 563 RQG, 943 RQG, 55 RQS, U.S. Customs and Border Protection, Aerospace Maintenance and Regeneration Center, and Operation Snowbird. In addition, transient aircraft arrive and depart at Davis-Monthan AFB.

E.5 Aircraft Flight Profiles

For purposes of this modeling effort, aircraft “flight profiles” denote the aircraft power settings, altitudes above runway level, and airspeeds along each flight track. Aircraft flight profiles for based aircraft were obtained from the 2008 Draft AICUZ study. Generic flight profiles from the NOISEMAP database were used to model operations for other military and civilian aircraft types. Noise data from the aircraft noise database in NOISEMAP were used to model operations for all aircraft types.

E.6 Climatological Data

Weather conditions, measured by temperature and relative humidity are an important factor in the propagation of noise as they affect sound absorption. The month with the sixth smallest sound absorption coefficient for Davis-Monthan AFB has an average monthly temperature of 71 degrees Fahrenheit and 37 percent relative humidity.

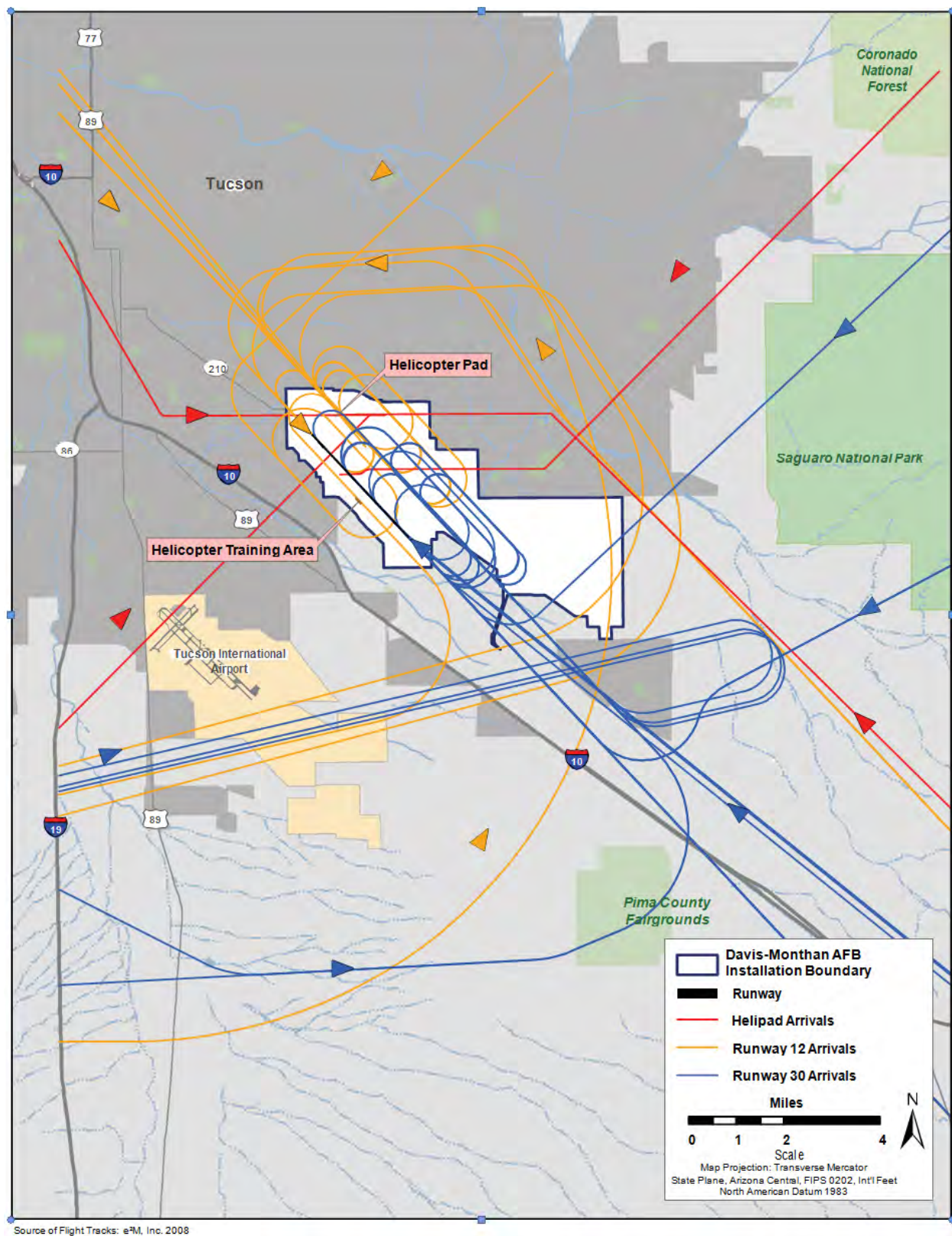


Figure E-1. Arrival Flight Tracks

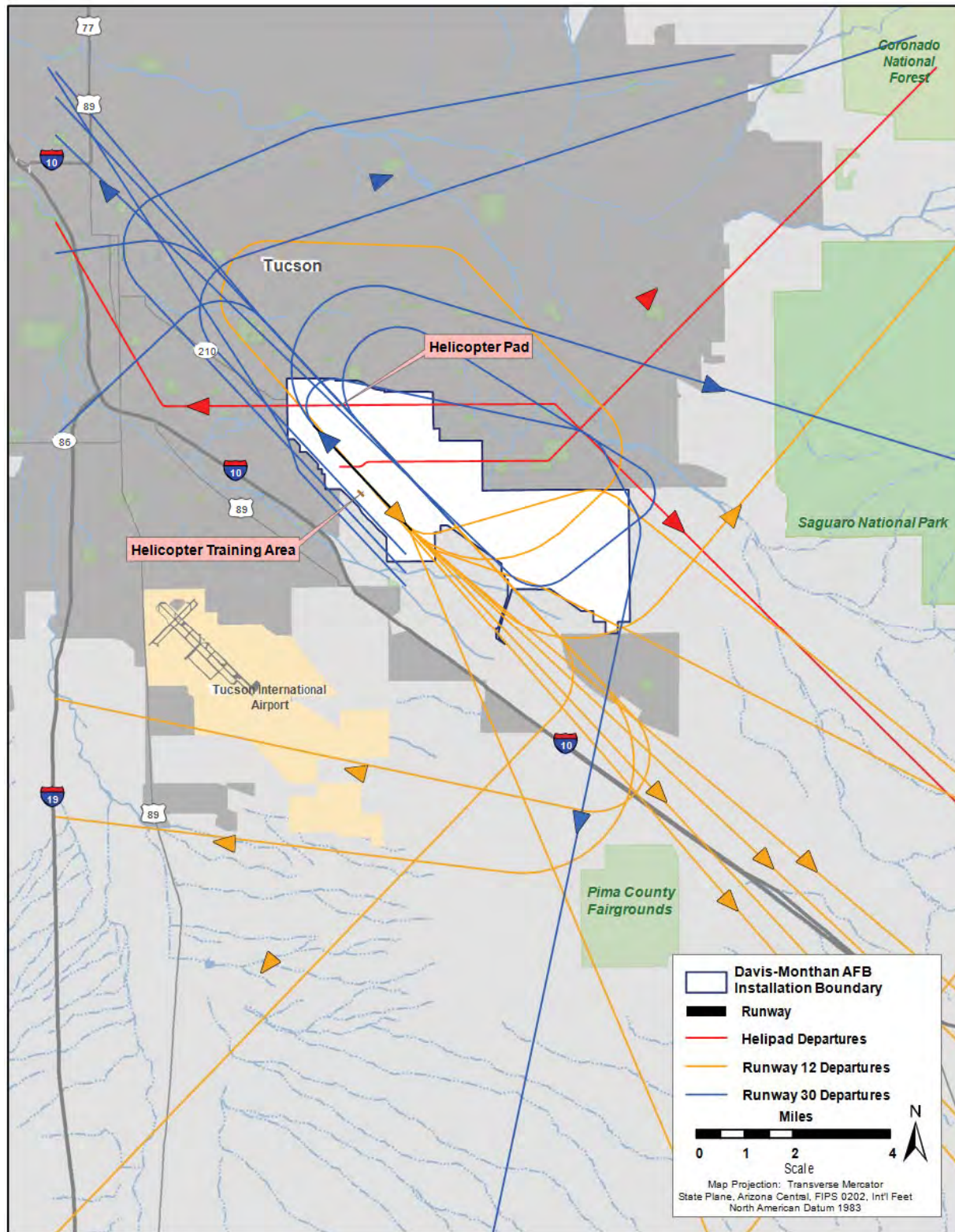
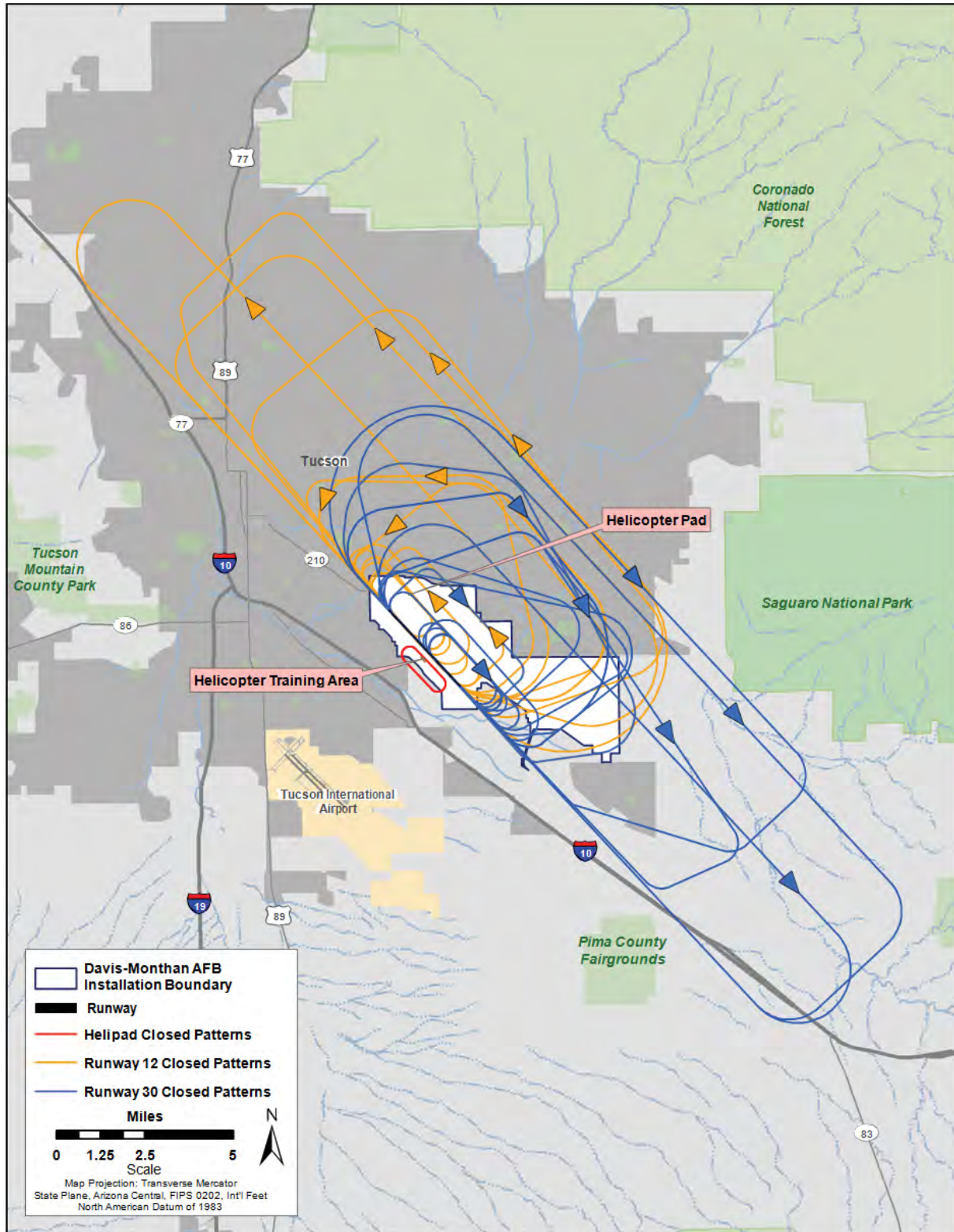


Figure E-2. Departure Flight Tracks



Source of Flight Tracks: eTM, Inc. 2008

Figure E-3. Closed-Pattern Flight Tracks

E-7 Noise Exposure

Figure E-4 shows the baseline DNL noise contours plotted in 5 dBA increments, ranging from 65 dBA DNL to 80 dBA DNL. The baseline 65 dBA DNL noise contour extends approximately one mile from both ends of the runway. As mentioned above, 65 dBA DNL is the noise level below which all land uses are compatible with airfield operations.

Figure E-5 shows the DNL noise contours with the proposed AT operations. The addition of the proposed AT and associated air operations would have a minute incremental impact on the noise surrounding Davis-Monthan AFB. These changes would not be even a barely perceptible change in noise when compared to baseline conditions.

E-8 Conclusions

This Noise Modeling Technical Appendix is in support of the EA Addressing the Angel Thunder Personnel Recovery Training Exercise at Davis-Monthan AFB, Arizona. It documents the baseline aircraft operations and noise, the aircraft operations and noise with the proposed AT exercise. The addition of the proposed AT air operations would have a minute incremental nonsignificant impact on the noise surrounding Davis-Monthan AFB when compared to baseline conditions.

E-9 References

- Davis-Monthan AFB. 2008. Davis-Monthan AFB. Draft Air Installation Compatible Use Zone Study.
- U.S. Air Force (USAF). 2002. Air Force Instruction 32-7063: Air Installation Compatible Use Zone (AICUZ) Program.
- U.S. Air Force (USAF). 2013. NOISEMAP Aircraft Noise Model, Version 7.3.

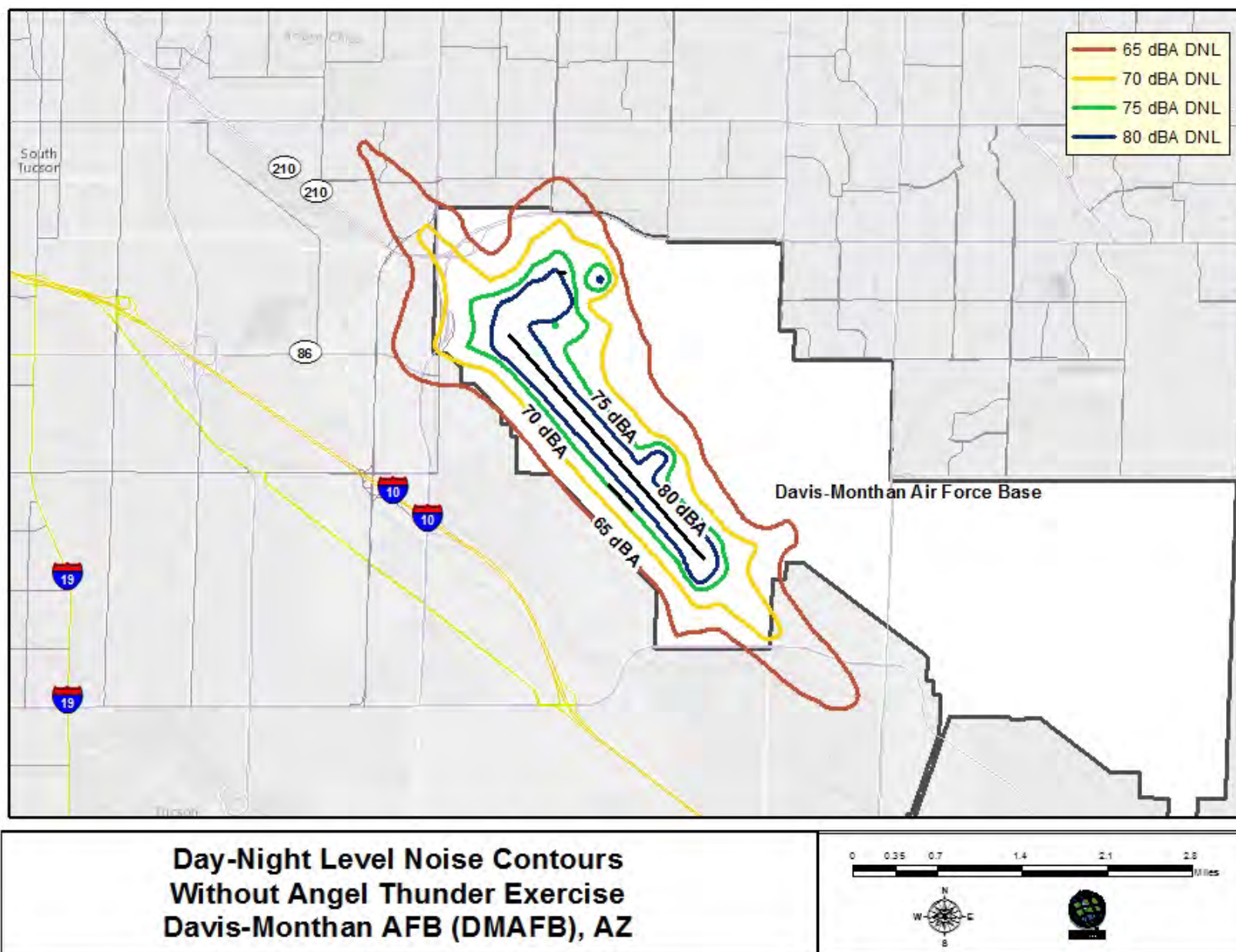


Figure E-4. Average Daily Noise Contours - Baseline Conditions

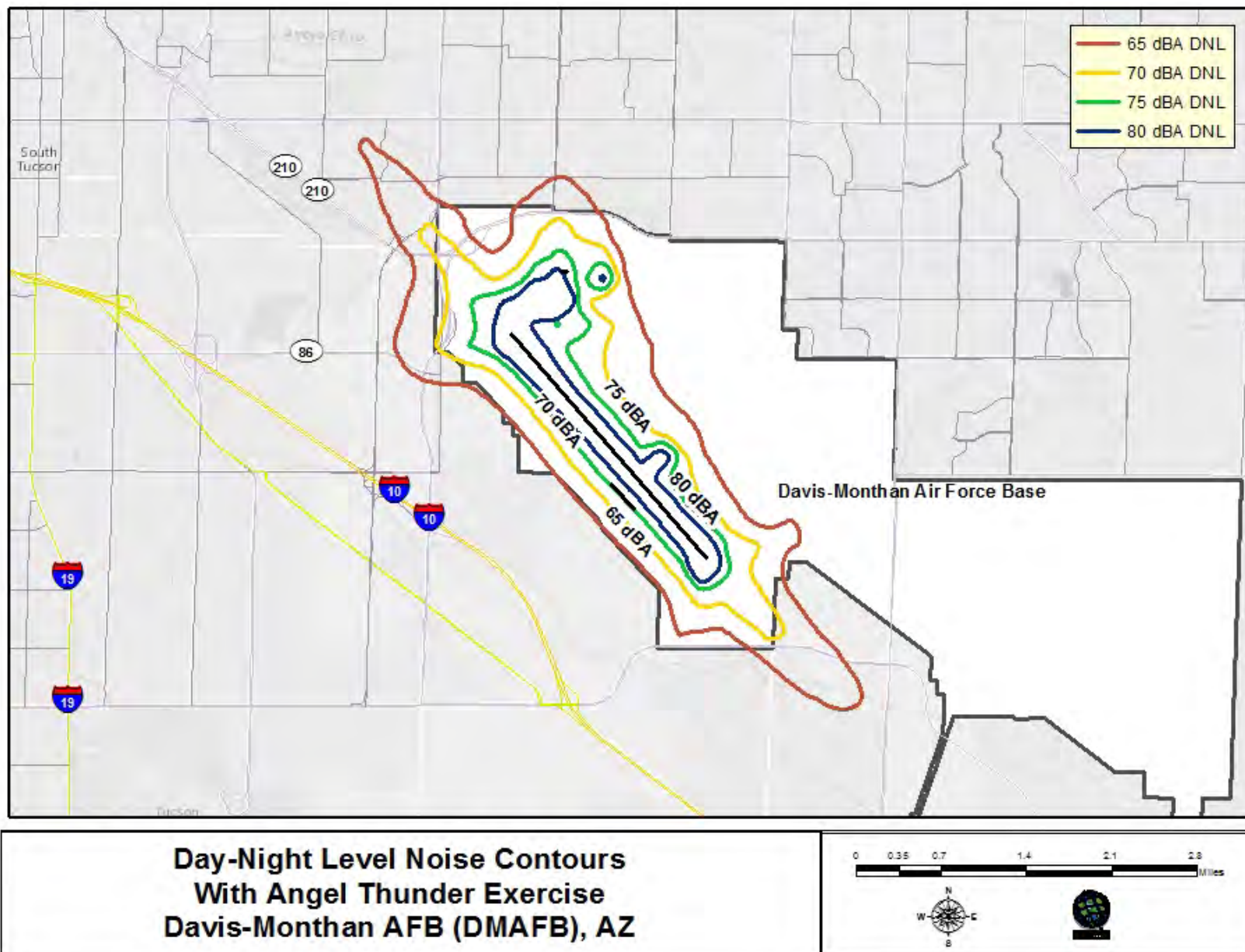


Figure E-5. Average Daily Noise Contours - Proposed Action

Attachment 1 - Land Use Compatibility Guidelines

The USAF guidelines for land use compatibility in aircraft noise zones is shown in the table below and are extracted from Appendix A of AFI 32-7063 dated 15 July 2015. These land use compatibility guidelines have been included for reference purposes (**Table E-2**).

Table E-2. Land Use Compatibility Guidelines

SLUCM NO.	LAND USE NAME	DNL or CNEL 65-69	DNL or CNEL 70-74	DNL or CNEL 75-79	DNL or CNEL 80-84	DNL or CNEL 85+
10	Residential					
11	Household units	N1	N1	N	N	N
11.11	Single units: detached	N1	N1	N	N	N
11.12	Single units: semidetached	N1	N1	N	N	N
11.13	Single units: attached row	N1	N1	N	N	N
11.21	Two units: side-by-side	N1	N1	N	N	N
11.22	Two units: one above the other	N1	N1	N	N	N
11.31	Apartments: walk-up	N1	N1	N	N	N
11.32	Apartment: elevator	N1	N1	N	N	N
12	Group quarters	N1	N1	N	N	N
13	Residential hotels	N1	N1	N	N	N
14	Mobile home parks or courts	N	N	N	N	N
15	Transient lodgings	N1	N1	N1	N	N
16	Other residential	N1	N1	N	N	N
20	Manufacturing					
21	Food and kindred products; manufacturing	Y	Y2	Y3	Y4	N
22	Textile mill products; manufacturing	Y	Y2	Y3	Y4	N
23	Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing	Y	Y2	Y3	Y4	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y2	Y3	Y4	N
25	Furniture and fixtures; manufacturing	Y	Y2	Y3	Y4	N
26	Paper and allied products; manufacturing	Y	Y2	Y3	Y4	N
27	Printing, publishing, and allied industries	Y	Y2	Y3	Y4	N
28	Chemicals and allied	Y	Y2	Y3	Y4	N
29	Petroleum refining and related industries	Y	Y2	Y3	Y4	N
30	Manufacturing (continued)					
31	Rubber and misc. plastic products; manufacturing	Y	Y2	Y3	Y4	N
32	Stone, clay and glass products; manufacturing	Y	Y2	Y3	Y4	N
33	Primary metal products; manufacturing	Y	Y2	Y3	Y4	N
34	Fabricated metal products; manufacturing	Y	Y2	Y3	Y4	N

SLUCM NO.	LAND USE NAME	DNL or CNEL 65-69	DNL or CNEL 70-74	DNL or CNEL 75-79	DNL or CNEL 80-84	DNL or CNEL 85+
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y2	Y3	Y4	N
40	Transportation, communication and utilities					
41	Railroad, rapid rail transit, and street railway transportation	Y	Y2	Y3	Y4	N
42	Motor vehicle transportation	Y	Y2	Y 3	Y4	N
43	Aircraft transportation	Y	Y2	Y3	Y4	N
44	Marine craft transportation	Y	Y2	Y3	Y4	N
45	Highway and street right-of-way	Y	Y	Y	Y	N
46	Automobile parking	Y	Y	Y	Y	N
47	Communication	Y	255	305	N	N
48	Utilities	Y	Y2	Y3	Y4	N
49	Other transportation, communication and utilities	Y	255	305	N	N
50	Trade					
51	Wholesale trade	Y	Y2	Y3	Y4	N
52	Retail trade – building materials, hardware and farm equipment	Y	25	30	Y4	N
53	Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc.	Y	25	30	N	N
54	Retail trade – food	Y	25	30	N	N
55	Retail trade – automotive, marine craft, aircraft and accessories	Y	25	30	N	N
56	Retail trade – apparel and accessories	Y	25	30	N	N
57	Retail trade – furniture, home,	Y	25	30	N	N
58	Retail trade – eating and drinking establishments	Y	25	30	N	N
59	Other retail trade	Y	25	30	N	N
60	Services					
61	Finance, insurance and real estate services	Y	25	30	N	N
62	Personal services	Y	25	30	N	N
62.4	Cemeteries	Y	Y2	Y3	Y4,11	Y6,11
63	Business services	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y2	Y3	Y4	N
64	Repair services	Y	Y2	Y3	Y4	N
65	Professional services	Y	25	30	N	N
65.1	Hospitals, other medical facilities	25	30	N	N	N
65.16	Nursing homes	N1	N1	N	N	N

SLUCM NO.	LAND USE NAME	DNL or CNEL 65-69	DNL or CNEL 70-74	DNL or CNEL 75-79	DNL or CNEL 80-84	DNL or CNEL 85+
66	Contract construction services	Y	25	30	N	N
67	Government services	Y1	25	30	N	N
68	Educational services	25	30	N	N	N
68.1	Child care services, child development centers, and nurseries	25	30	N	N	N
69	Miscellaneous Services	Y	25	30	N	N
69.1	Religious activities (including places of worship)	Y	25	30	N	N
70	Cultural, entertainment and recreational					
71	Cultural activities	25	30	N	N	N
71.2	Nature exhibits	Y1	N	N	N	N
72	Public assembly	Y	N	N	N	N
72.1	Auditoriums, concert halls	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	N	N	N
73	Amusements	Y	Y	N	N	N
74	Recreational activities	Y	25	30	N	N
75	Resorts and group camps	Y	25	N	N	N
76	Parks	Y	25	N	N	N
79	Other cultural, entertainment and recreation	Y	25	N	N	N
80	Resource production and extraction					
81	Agriculture (except live- stock)	Y8	Y9	Y10	Y10,11	Y10,11
81.5-81.7	Agriculture-Livestock farming including grazing and feedlots	Y8	Y9	N	N	N
82	Agriculture related activities	Y8	Y9	Y10	Y10,11	Y10,11
83	Forestry activities	Y8	Y9	Y10	Y10,11	Y10,11
84	Fishing activities	Y	Y	Y	Y	Y
85	Mining activities	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y

KEY:

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation

Y (Yes)– Land use and related structures compatible without restrictions.

N (No) – Land use and related structures are not compatible and should be prohibited.

Y^x – Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

N^x – No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

25, 30, or 35 – The numbers refer to noise level reduction (NLR) levels. NLR (outdoor to indoor) is achieved through the incorporation of noise attenuation into the design and construction of a structure. Land use and related structures are generally compatible; however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structures. However, measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

DNL – Day-Night Average Sound Level.

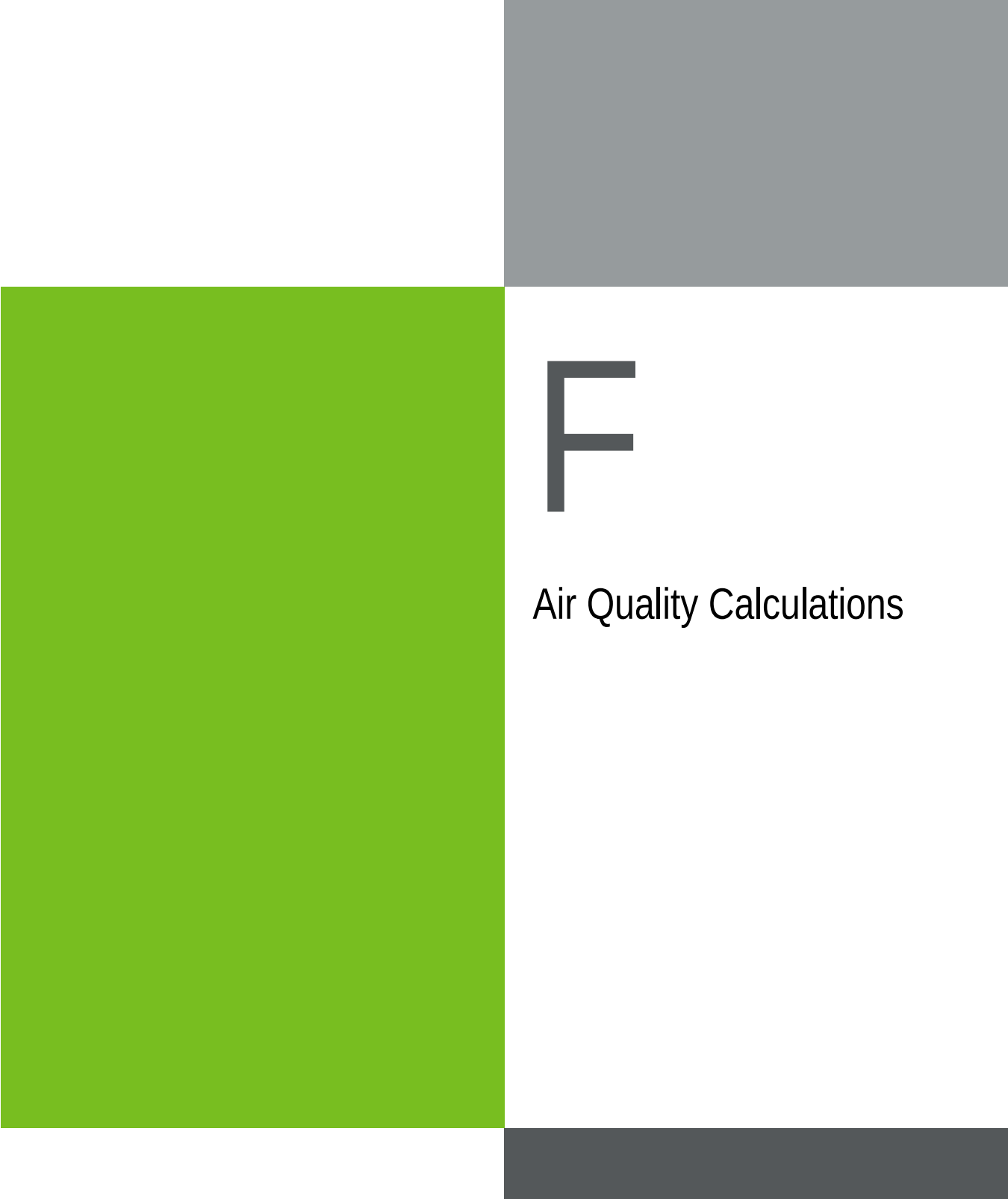
CNEL – Community Noise Equivalent Level (normally within a very small decibel difference of DNL)

Ldn – Mathematical symbol for DNL.

NOTES:

1. General

- a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-69 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.
 - b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-79.
 - c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.
 - d. NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.
2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
 3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
 4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
 5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
 6. Buildings are not permitted.
 6. Buildings are not permitted.
 7. Land use is compatible provided special sound reinforcement systems are installed.
 8. Residential buildings require an NLR of 25
 9. Residential buildings require an NLR of 30.
 10. Residential buildings are not permitted.
 11. Land use that involves outdoor activities is not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.



F

Air Quality Calculations

Appendix F: Air Quality Calculation

Summary	Summarizes total emissions by calendar year for the Preferred Alternative - Angel Thunder Training Exercise
Aircraft Operations	Aircraft operations consist of take-off and landings cycles (LTOs) from operating base airfields and low-level operations at training sites.
Ground Operations	Ground Operations include tactical ground vehicles used at training sties.

Criteria Pollutant and GHG Emissions Summary for Preferred Alternative - Angel Thunder Training Exercise (ton/yr)

Source Category	NOx	SOx	CO	VOC	PM10	PM2.5	GHG (metric ton)
Aircraft Operations	60.8	3.4	53.0	17.1	9.8	8.3	4813.5
Ground Operations	1.3	0.005	1.9	0.5	11.5	11.4	483.9
Total Criteria and GHG Pollutant Emissions	62.2	3.4	55.0	17.6	21.3	19.7	5297.4

Total Emissions By County		Total Emissions tons per year (ton/yr)						
Region	County	NOx	SOx	CO	VOC	PM10	PM2.5	GHG (metric ton)
Southern Arizona	Cochise	6.50	0.351	4.24	0.934	0.88	0.84	540.32
Southern Arizona	Gila	0.07	0.008	0.11	0.002	0.29	0.26	20.12
Southern Arizona	Graham	0.03	0.004	0.05	0.001	0.26	0.24	10.06
Southern Arizona	Maricopa	0.68	0.090	1.41	0.338	1.42	1.35	233.29
Southern Arizona	Pima	40.13	2.085	37.55	13.611	4.77	4.15	2881.26
Southern Arizona	Pinal	0.10	0.014	0.23	0.079	0.56	0.54	36.95
Southern Arizona	Santa Cruz	0.23	0.030	0.45	0.089	0.55	0.51	77.59
Northern Arizona	Apache	0.05	0.007	0.17	0.079	0.71	0.71	25.55
Northern Arizona	Coconino	10.04	0.580	6.80	1.482	5.62	5.56	918.51
Northern Arizona	Gila	0.02	0.002	0.03	0.001	0.16	0.15	6.36
Northern Arizona	Greenlee	0.02	0.002	0.03	0.002	0.30	0.29	8.89
Northern Arizona	Mohave	0.02	0.004	0.08	0.038	0.15	0.15	10.35
Northern Arizona	Navajo	0.03	0.004	0.09	0.039	0.29	0.29	12.88
New Mexico	Catron	0.41	0.054	0.86	0.214	1.60	1.56	148.05
New Mexico	Curry	0.05	0.007	0.14	0.055	0.18	0.17	19.94
New Mexico	Dona Ana	0.05	0.007	0.14	0.055	0.18	0.17	19.94
New Mexico	Hidalgo	0.05	0.007	0.14	0.055	0.18	0.17	19.94
California	Imperial	0.01	0.001	0.02	0.0013	0.14	0.13	4.15
California	Los Angeles	0.03	0.003	0.05	0.002	0.44	0.33	9.53
California	Orange	0.02	0.002	0.03	0.002	0.29	0.29	8.25
California	Riverside	0.01	0.001	0.02	0.001	0.42	0.31	4.15
California	San Diego	3.63	0.162	2.32	0.555	1.47	1.23	277.21
California	Ventura	0.01	0.001	0.02	0.001	0.42	0.31	4.15
Totals		62.2	3.4	55.0	17.6	21.3	19.7	5297.4

Training Sites for the Preferred Alternative - Angel Thunder Training Exercise

- Training site information was provided in the Final 2016 Description of the Proposed Action and Alternatives (DOPAA) and the Davis Monthan AF Form 813 Continuation Pages for ACC Personnel Recovery Exercise ANGEL THUNDER (Air Force 2015).
- If no specific notes were included in the reference documents regarding the proposed activities at an individual site, proposed actions were assumed based on the site's type (i.e. an HLZ was assumed to correspond to rotary wing aircraft activity).
- Classification assumed based on site descriptions, contact information or maps.

Training Locations

Proposed Action - Implementation Phase

Southern Arizona											
Site	Location	County	Fixed Wing	Rotary Wing	Drop Zone	Ground	C4I	Logistical	FARP	Type	Classification
Bisbee Douglas KDUG	Douglas, AZ	Cochise	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Misc
HighWay 80 Paladins (TW 2)	AZ	Cochise			X					DZ/HLZ	Misc
Hubbard	Fort Huachuca, AZ	Cochise	X	X	X	X			X	FARP	Military
Hubbard (Tombstone)	Fort Huachuca, AZ	Cochise	X	X	X	X				DZ/HLZ/LZ	Military
Humor	Fort Huachuca, AZ	Cochise		X	X	X				DZ/HLZ	Military
Libby Air Field KFHU	Fort Huachuca, AZ	Cochise	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Military
Ranger	Tombstone MOA	Cochise		X	X	X	X	X		DZ/HLZ	USFS
Tombstone Circular (Hubbard)	Fort Huachuca, AZ	Cochise			X					DZ	Military
Tombstone Paladins	Elfrida, AZ	Cochise		X	X	X				DZ/HLZ	Misc
Tombstone Rectangular (Hubbard)	Fort Huachuca, AZ	Cochise			X					DZ	Military
Salt River (High)	White River, AZ	Gila		X		X				HLZ	Misc
Salt River (Low)	San Carlos, AZ	Gila		X		X				HLZ/Water	Misc
Mesa	San Pedro Valley, AZ	Graham		X						HLZ	USFS
Aux 6	BMGR, AZ	Maricopa	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Military
Aux 6 Circular	BMGR, AZ	Maricopa	X	X	X	X	X	X		DZ/HLZ/LZ	Military
Aux 6 Rectangular	BMGR, AZ	Maricopa	X	X	X	X	X	X		DZ/HLZ/LZ	Military
Gila Bend Airbase KGXF	Gila Bend, AZ	Maricopa	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Military
NATO Hill (WPT 74)	BMGR, AZ	Maricopa		X						HLZ	Military
OP Charlie	BMGR, AZ	Maricopa		X						HLZ/CSA	Military
Range 3 - HLZ 1	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - HLZ 2	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - HLZ 3	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - HLZ 4	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - HLZ 5	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - HLZ 6	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Range 3 - Tower Helipad	BMGR, AZ	Maricopa		X						HLZ	Military
Saguaro Lake Ranch	Mesa, AZ	Maricopa		X		X				Water	Misc
Scottsdale Osborne	Scottsdale, AZ	Maricopa		X						HLZ	Misc
Sky Harbor IAP KPHX	Phoenix, AZ	Maricopa	X				X	X		LZ	Misc
South TAC	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Target 333	BMGR, AZ	Maricopa		X	X	X				HLZ	Military
Davis Monthan AFB	Tucson, AZ	Pima	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Military
Mount Lemon	Tucson, AZ	Pima		X		X	X	X		Ground	USFS
Pima County Ops Center	Tucson, AZ	Pima					X			Ops	Misc
Pima County Regional Training	Tucson, AZ	Pima				X				MOUT	Misc
Ruby Fuzzy Paladins	Arivaca, AZ	Pima		X	X	X				DZ/HLZ	Misc
UA Medical Center	Tucson, AZ	Pima		X						HLZ	Misc
Coolidge Airport	Coolidge, AZ	Pinal	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Misc
Eloy North	Eloy AZ	Pinal			X					DZ/HLZ	Misc
Eloy South	Eloy AZ	Pinal			X					DZ/HLZ	Misc
Florence	Florence, AZ	Pinal		X	X	X	X	X	X	DZ/HLZ/MOUT	Military
Canelo	Canelo, AZ	Santa Cruz		X	X	X				DZ/HLZ	USFS
Devon	Rubby Fuzzy MOA, AZ	Santa Cruz		X						HLZ	USFS
Little Outfit	Sonoita, AZ	Santa Cruz	X	X	X	X	X	X		DZ/HLZ	Misc
Saddle Mountain East	Sonoita, AZ	Santa Cruz		X	X	X				DZ/HLZ	USFS
Saddle Mountain South	Sonoita, AZ	Santa Cruz		X	X	X				DZ/HLZ	USFS
Saddle Mountain West	Sonoita, AZ	Santa Cruz		X	X	X				DZ/HLZ	USFS

Training Locations

Proposed Action - Implementation Phase

		Fixed Wing	Rotary Wing	Drop Zone	Ground	C4I	Logistical	FARP
County Subtotals	Cochise	4	7	10	7	3	3	3
	Gila	0	2	0	2	0	0	0
	Graham	0	1	0	0	0	0	0
	Maricopa	5	17	12	13	5	5	2
	Pima	1	4	2	4	3	2	1
	Pinal	1	2	4	2	2	2	2
	Santa Cruz	1	6	5	5	1	1	0
	Total	12	39	33	33	14	13	8

Training Locations
Proposed Action - Implementation Phase

Northern Arizona											
Site	Location	County	FW	RW	Drop	Ground	C4I	Logistical	FARP	Type	Classification
Caldwell Cabins	Alpine, AZ	Apache		X	X	X	X	X		DZ/HLZ	USFS
Caldwell Meadows	Alpine, AZ	Apache		X	X	X	X			DZ/HLZ	USFS
Springerville KJTC	Springerville, AZ	Apache	X	X	X	X	X	X		HLZ/LZ	Misc
Sprucedale Guest Ranch	Alpine, AZ	Apache		X	X	X	X	X		Ground	Misc
St. Johns Industrial Air Park	St. Johns, AZ	Apache	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Misc
Lee's Ferry	Marble Canyon, AZ	Cococino	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
Anita Station	Old Grand Canyon Airport	Coconino		X	X	X				DZ/HLZ	USFS
Babbitt Ranch 1	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Babbitt Ranch 2	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Babbitt Ranch 3	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Black Mesa USFS Helitack Base	Overgaard, AZ	Coconino		X	X	X	X	X		DZ/HLZ	USFS
Bone Crusher	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Misc
Camp Navajo Army Base	Camp Navajo, AZ	Coconino		X	X	X	X	X		MOUT	Military
Cattle LTFW	Flagstaff, AZ	Coconino	X	X	X	X	X	X		HLZ/LZ	Misc
Comanche	Flagstaff, AZ	Coconino			X	X				DZ	USFS
Elk	Flagstaff, AZ	Coconino			X	X				DZ	USFS
Flagstaff Hotshot	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	USFS
Flagstaff KFLG	Flagstaff, AZ	Coconino	X	X		X	X	X		HLZ/LZ	Misc
FR 320/311	Flagstaff, AZ	Coconino	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
Gerbil	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Misc
Grand Canyon Airport KGCN	Tusayan, AZ	Coconino	X	X		X	X	X		LZ	Misc
Grand Canyon Valle Airport 40G	Valle, AZ	Coconino	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
HA Clark Memorial Field KCMR	Williams, AZ	Coconino	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
HLZ 5	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
HLZ 6	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
HLZ 7	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
HLZ 8	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Jacks Canyon	Happy Jack, AZ	Coconino		X		X				HLZ	USFS
L Tank	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ/MOUT	Military
Longview USFS Helitack Base	Flagstaff, AZ	Coconino		X	X	X	X	X		HLZ	USFS
Meteor Crater	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Metz Tank	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Military
Mogollon Rim (General Crook)	Strawberry, AZ	Coconino		X		X				HLZ	USFS
Mohawk	Tusayan, AZ	Coconino			X	X				DZ	USFS
Mormon Lake	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	USFS
Navajo East	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Military
Navajo Railroad	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Military
Navajo West	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Military
Neill Flat	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Military
Old Grand Canyon Airport	Flagstaff, AZ	Coconino		X	X	X	X			DZ/HLZ	USFS
Panda	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Pittman Valley	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	USFS
Rodgers Napier	Camp Navajo, AZ	Coconino		X		X	X	X		HLZ	Military
Rodgers Wren	Camp Navajo, AZ	Coconino		X		X	X	X		HLZ	Military
Rogers Lake (Logger Camp)	Camp Navajo, AZ	Coconino		X	X	X	X	X		DZ/HLZ/MOUT	Military
Rough Rider	Oak Creek Village, AZ	Coconino		X		X				HLZ	USFS
Sage	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Misc

Training Locations
Proposed Action - Implementation Phase

Sinkhole	Flagstaff, AZ	Coconino		X		X	X	X		HLZ	Misc
Squirrel	Flagstaff, AZ	Coconino		X	X	X	X	X		DZ/HLZ	Misc
Tribeland	Tusayan, AZ	Coconino		X	X	X				DZ	USFS
Gila County Sherriff's	Roosevelt, AZ	Gila		X	X	X	X	X		HLZ	Misc
Payson-Rimside	Payson, AZ	Gila			X	X				DZ	USFS
Roosevelt Lake	Roosevelt Lake, AZ	Gila		X	X	X				DZ/HLZ/Water	USFS
Hannagan Meadow USFS Helitack	Alpine, AZ	Greenlee		X	X	X	X	X		HLZ	USFS
HeliBase Circular	Alpine, AZ	Greenlee			X	X	X	X		DZ/HLZ	USFS
KP Circular	Alpine, AZ	Greenlee		X	X	X				DZ/HLZ	USFS
KP Tank	Alpine, AZ	Greenlee		X	X	X				DZ/HLZ	USFS
Colorado River	Bullhead City, AZ	Mohave				X				Water	Misc
Kingman KIGM	Kingman, AZ	Mohave	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
Overgaard USFS Helitack Base	Overgaard, AZ	Navajo		X	X	X	X	X		DZ/HLZ	USFS
Winslow KINW	Winslow, AZ	Navajo	X	X	X	X	X	X	X	DZ/HLZ/LZ/FARP	Misc

		Fixed Wing	Rotary Wing	Drop Zone	Ground	C4I	Logistical	FARP
County Subtotals	Apache	2	5	5	5	5	4	1
	Coconino	7	42	28	45	37	36	0
	Gila	0	2	3	3	1	1	0
	Greenlee	0	3	4	4	2	2	0
	Mohave	1	1	1	2	1	1	0
	Navajo	1	2	2	2	2	2	1
	Total	11	55	43	61	48	46	2

Training Locations
Proposed Action - Implementation Phase

New Mexico											
Site	Location	County	FW	RW	Drop	Ground	C4I	Logistical	FARP	Type	Classification
Catron Fairgrounds	Reserve, NM	Catron		X	X	X	X	X		HLZ	Misc
Glenwood Ranger Station	Glenwood, NM	Catron		X	X	X	X	X		DZ/HLZ	USFS
Negrito Airstrip	Reserve, NM	Catron	X	X	X	X	X	X		DZ/HLZ/LZ	USFS
Negrito Center	NM	Catron		X	X	X	X	X		DZ/HLZ	USFS
Negrito Helibase	Reserve, NM	Catron		X		X	X	X		HLZ	USFS
Negrito North	NM	Catron		X	X	X	X	X		DZ/HLZ	USFS
Negrito South	NM	Catron		X	X	X	X	X		DZ/HLZ	USFS
Rainy Mesa	Reserve, NM	Catron		X	X	X				HLZ	USFS
Reserve Airport T16	Reserve, NM	Catron	X	X	X	X	X	X		DZ/HLZ/LZ	Misc
Reserve Ranger Station	Reserve, NM	Catron	X	X		X	X	X		DZ/HLZ	USFS
Melrose Air Force Range	Clovis, NM	Curry	X	X	X	X	X	X		DZ/HLZ/MOUT	USFS
White Sands Missile Range	Las Cruces, NM	Dona Ana	X	X	X	X	X	X		DZ/HLZ/MOUT	Military
Playas Research Center	PRTC, NM	Hidalgo	X	X	X	X	X	X		DZ/HLZ/LZ/MOUT	Misc

		Fixed Wing	Rotary Wing	Drop Zone	Ground	C4I	Logistical	FARP
County Subtotals	Catron	3	10	8	10	9	9	0
	Curry	1	1	1	1	1	1	0
	Dona Ana	1	1	1	1	1	1	0
	Hidalgo	1	1	1	1	1	1	0
	Total	6	13	11	13	12	12	0

California											
Site	Location	County	FW	RW	Drop	Ground	C4I	Logistical	FARP	Type	Classification
El Centro KNJK	El Centro, CA	Imperial	X	X	X	X	X	X	X	LZ/FARP	Military
Knots Circular Water	San Clemente Island, CA	Los Angeles		X	X	X				DZ/HLZ/Water	Military
Nautica Circular Water	San Clemente Island, CA	Los Angeles		X	X	X				DZ/HLZ	Military
San Clemente Island KNUC	San Clemente Island, CA	Los Angeles	X	X	X	X	X	X		HLZ/LZ	Military
Camp Pendleton Cartwright Water	Camp Pendleton, CA	N/A (Offshore)			X					DZ/HLZ/Water	Military
Leon	San Diego, CA	N/A (Offshore)		X	X	X				DZ/HLZ	Military
San Clemente Island West	San Clemente Island, CA	N/A (Offshore)	X	X	X	X	X	X		DZ/HLZ	Military
Platform Emmy Heliport	Huntington Beach, CA	Orange		X	X	X	X			Platform	Misc
Union Eva Heliport	Huntington Beach, CA	Orange		X	X	X	X			Platform	Misc
March AFB KRIV	March AFB, CA	Riverside	X	X	X	X	X	X	X	HLZ/LZ/FARP	Military
Camp Pendleton, HOLF	Camp Pendleton, CA	San Diego	X	X	X	X	X	X		DZ/HLZ/MOUT	Military
Camp Pendleton, NFG	Camp Pendleton, CA	San Diego		X	X	X	X	X		DZ/HLZ/LZ	Military
Camp Pendleton, Off-road Trail	Camp Pendleton, CA	San Diego		X		X				Ground	Military
Camp Pendleton, PDL	Camp Pendleton, CA	San Diego		X	X	X	X	X		DZ/HLZ/MOUT	Military
Camp Pendleton, Red Beach	Camp Pendleton, CA	San Diego		X	X	X	X	X		DZ/HLZ/Water	Military
NAS North Island NZY	Coronado, CA	San Diego	X	X	X	X	X	X		HLZ/LZ	Military
San Nicolas Island KNSI	San Nicolas Island, CA	Ventura	X	X	X	X	X	X		HLZ/LZ	Military

		Fixed Wing	Rotary Wing	Drop Zone	Ground	C4I	Logistical	FARP
County Subtotals	Imperial	1	1	1	1	1	1	1
	Los Angeles	1	3	3	3	1	1	0
	Orange	0	2	2	2	2	0	0
	Riverside	1	1	1	1	1	1	1
	San Diego	2	6	5	6	5	5	0
	Ventura	1	1	1	1	1	1	0
	Total	6	14	13	14	11	9	2

Training Locations
Proposed Action - Implementation Phase

Airfield Operations for the Preferred Alternative • Angel Thunder Training Exercise

Airfield Activity Data (Worst Case Scenario)

Aircraft Model Listed in the AF-813	Aircraft Model Used to Match to Available Emission Factors	Engine Model	# Engines	APU Model	Number of APUs	APU Hours	Total AGE Hours
A-10	A-10	TF34-GE-100A	2	GTCP 36-50	1	1	23.0
A-29	A-29	PT6A-68	1				14.1
AH-64	AH-64	T700-GE-700	2				20.5
B-212	UH-1N	T400-CP-400	2				20.5
C-130	C-130H	T56-A-15	4	GTCP 85-180L	1	1	32.8
Cessna 182	Cessna 172	O-470C	1				3.2
CH-47	CH-53	T64-GE-100	2				20.5
E-2C	E-2C	T56-A-15	2				50.8
E-3	E-3C	TF33-P-100A	4	GTCP 165-1	1	2	50.8
E-8	E-8	TF33-P-102A	4	GTCP 85	1	2	50.8
EC-130	EC-130H	T56-A-15	4	GTCP 85-180L	1	1	32.8
EC-725	HH-60	T700-GE-700	2				20.5
HC-130	HC-130H	T56-A-15	4	GTCP 85-180L	1	1	32.8
HC-130P/N/J	HC-130P	T56-A-15	4				32.8
HH-60	HH-60	T700-GE-700	2				20.5
HH-60G	HH-60G	T700-GE-700	2				20.5
KC-135	KC-135R	F108-CF-201	4				34.4
MC-12	MC-12	PT6A-65	2				0.8
MH-60R/S	MH-60R	T700-GE-700	2				20.5
MQ-1A	MQ-9	TPE331-3	1				60.0
OV-10	OV-10	T76-G-419	2				23.0
RC-135	RC-135	F108-CF-201	4				34.4
UH-60	UH-60	T700-GE-700	2				19.5

Note: Aircraft types come from AF Form 613, Continuation Pages for ACC Personnel Recovery Exercise ANGEL THUNDER (Air Force 3015).

Note: Aircraft engine information, APU information and AGE hours are from the Air Emissions Guide for Air Force Mobile Sources, Tables V-5, V-5a and V-3-3 (AFCEC 7/114).

Emission Factors (EFs) and Constants for the Preferred Alternative - Angel Thunder Training Exercise

Aircraft Pollutant Emission Factors

						Emission Factors in lb Pollutant per 1000 lb Fuel Burned (lb/1000 lb)								
Aircraft Model	Engine Model	No. of Engines	Reference Thrust Mode	LTO/TGO Thrust Mode	Fuel Flow (lb/hr)	NOx	SOx	CO	VOC	PM10	PM2.5	GHG	TIM (hr)	
A-10	TF34-GE-100A	2	Idle	Idle	498	0.32	1.06	65.62	2.24	8.13	3.6	3255.41	0.50	
A-10	TF34-GE-100A	2	Approach	Approach	933	3.09	1.06	27.92	1.44	6.21	2.12	3255.41	0.06	
A-10	TF34-GE-100A	2	Intermediate	Climbout	1512	5.61	1.06	8.88	0.13	8.93	6.95	3255.41	0.01	
A-10	TF34-GE-100A	2	Military	Takeoff	2628	9.11	1.06	3.94	0.07	2.66	1.68	3255.41	0.01	
A-29	PT6A-68	1	Ground Idle	Idle	156	1.77	1.06	117.85	7.89	3.95	2.16	3255.41	0.50	
A-29	PT6A-68	1	Approach	Approach	449	4.73	1.06	10.91	0.71	3.34	0.7	3255.41	0.06	
A-29	PT6A-68	1	Max Continuous	Climbout	612	8.18	1.06	3.88	0.20	4.30	0.61	3255.41	0.01	
A-29	PT6A-68	1	Max Continuous	Takeoff	612	8.18	1.06	3.88	0.20	4.30	0.61	3255.41	0.01	
AH-64	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25	
AH-64	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11	
AH-64	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08	
AH-64	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04	
B-212	T400-CP-400	2	Idle	Idle	136	2.21	1.06	27.94	10.99	0.44	0.4	3255.41	0.25	
B-212	T400-CP-400	2	Cruise	Approach	279	4.68	1.06	1.79	0.00	0.36	0.32	3255.41	0.11	
B-212	T400-CP-400	2	Military	Climbout	406	5.91	1.06	0	0.00	0.25	0.22	3255.41	0.08	
B-212	T400-CP-400	2	Maximum	Takeoff	1069	11.51	1.06	0	0.22	0.28	0.25	3255.41	0.04	
C-130	T56-A-15	4	Idle	Idle	794	3.9	1.06	32	24.15	0.83	0.75	3255.41	0.40	
C-130	T56-A-15	4	Approach	Approach	1185	4.4	1.06	22.2	14.26	0.97	0.87	3255.41	0.09	
C-130	T56-A-15	4	Climb Out	Climbout	1825	9.2	1.06	2.4	0.58	0.51	0.46	3255.41	0.02	
C-130	T56-A-15	4	Takeoff	Takeoff	2302	9.3	1.06	2.1	0.46	0.50	0.45	3255.41	0.01	
Cessna 182	O-470C	1	Idle	Idle	9	0.52	1.06	741.72	220.86	60.00	54	3255.41	0.22	
Cessna 182	O-470C	1	Approach	Approach	47	0.95	1.06	691.59	10.47	47.95	43.16	3255.41	0.08	
Cessna 182	O-470C	1	Climb Out	Climbout	67	3.97	1.06	956.61	6.61	40.00	36	3255.41	0.08	
Cessna 182	O-470C	1	Takeoff	Takeoff	89	2.19	1.06	1155.37	3.50	20.00	18	3255.41	0.01	
CH-47	T64-GE-100	2	Idle	Idle	298	1.11	1.06	76.46	1.26	2.36	2.14	3255.41	0.25	
CH-47	T64-GE-100	2	75% Normal	Approach	941	6.85	1.06	7.85	0.05	1.97	0.45	3255.41	0.11	
CH-47	T64-GE-100	2	Normal	Climbout	1698	9.46	1.06	2.21	0.01	1.61	0.88	3255.41	0.08	
CH-47	T64-GE-100	2	Military	Takeoff	1848	11.3	1.06	2.17	0.01	0.92	0.09	3255.41	0.04	
E-2C	T56-A-15	2	Idle	Idle	794	3.9	1.06	32	24.15	0.83	0.75	3255.41	0.40	
E-2C	T56-A-15	2	Approach	Approach	1185	4.4	1.06	22.2	14.26	0.97	0.87	3255.41	0.09	
E-2C	T56-A-15	2	Climb Out	Climbout	1825	9.2	1.06	2.4	0.58	0.51	0.46	3255.41	0.02	
E-2C	T56-A-15	2	Takeoff	Takeoff	2302	9.3	1.06	2.1	0.46	0.50	0.45	3255.41	0.01	
E-3	TF33-P-100A	4	Idle	Idle	1108	1.5	1.06	136.96	131.16	6.13	5.52	3255.41	0.40	
E-3	TF33-P-100A	4	Approach	Approach	2794	6.22	1.06	14.6	3.62	5.46	4.91	3255.41	0.09	
E-3	TF33-P-100A	4	Intermediate	Climbout	8089	8.47	1.06	2.96	0.39	5.29	4.76	3255.41	0.02	
E-3	TF33-P-100A	4	Military	Takeoff	10856	11.49	1.06	1.19	0.25	2.93	2.64	3255.41	0.01	
E-8	TF33-P-102A	4	Idle	Idle	1065	1.8	1.06	117.03	106.96	4.98	4.48	3255.41	0.40	
E-8	TF33-P-102A	4	Approach	Approach	3912	5.84	1.06	12.37	1.74	3.55	3.2	3255.41	0.09	
E-8	TF33-P-102A	4	Intermediate	Climbout	6985	8.74	1.06	2.01	0.95	3.15	2.84	3255.41	0.02	
E-8	TF33-P-102A	4	Military	Takeoff	8756	12.39	1.06	0.45	0.53	3.67	3.3	3255.41	0.01	
EC-130	T56-A-15	4	Idle	Idle	794	3.9	1.06	32	24.15	0.83	0.75	3255.41	0.40	
EC-130	T56-A-15	4	Approach	Approach	1185	4.4	1.06	22.2	14.26	0.97	0.87	3255.41	0.09	
EC-130	T56-A-15	4	Climb Out	Climbout	1825	9.2	1.06	2.4	0.58	0.51	0.46	3255.41	0.02	
EC-130	T56-A-15	4	Takeoff	Takeoff	2302	9.3	1.06	2.1	0.46	0.50	0.45	3255.41	0.01	
EC-725	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25	
EC-725	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11	
EC-725	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08	
EC-725	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04	
HC-130	T56-A-15	4	Idle	Idle	794	3.9	1.06	32	24.15	0.83	0.75	3255.41	0.40	
HC-130	T56-A-15	4	Approach	Approach	1185	4.4	1.06	22.2	14.26	0.97	0.87	3255.41	0.09	
HC-130	T56-A-15	4	Climb Out	Climbout	1825	9.2	1.06	2.4	0.58	0.51	0.46	3255.41	0.02	
HC-130	T56-A-15	4	Takeoff	Takeoff	2302	9.3	1.06	2.1	0.46	0.50	0.45	3255.41	0.01	

Aircraft Operations

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HC-130P/N/J	T56-A-15	4	Idle	Idle	794	3.9	1.06	32	24.15	0.83	0.75	3255.41	0.40
HC-130P/N/J	T56-A-15	4	Approach	Approach	1185	4.4	1.06	22.2	14.26	0.97	0.87	3255.41	0.09
HC-130P/N/J	T56-A-15	4	Climb Out	Climbout	1825	9.2	1.06	2.4	0.58	0.51	0.46	3255.41	0.02
HC-130P/N/J	T56-A-15	4	Takeoff	Takeoff	2302	9.3	1.06	2.1	0.46	0.50	0.45	3255.41	0.01
HH-60	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25
HH-60	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11
HH-60	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08
HH-60	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04
HH-60G	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25
HH-60G	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11
HH-60G	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08
HH-60G	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04
KC-135	F108-CF-201	4	Idle	Idle	1016	4	1.06	30.70	2.10	0.06	0.06	3255.41	0.80
KC-135	F108-CF-201	4	Approach	Approach	2468	8.2	1.06	4.20	0.09	0.06	0.05	3255.41	0.09
KC-135	F108-CF-201	4	Climbout	Climbout	6500	16	1.06	0.90	0.06	0.05	0.05	3255.41	0.03
KC-135	F108-CF-201	4	Takeoff	Takeoff	7818	18.5	1.06	0.90	0.05	0.07	0.06	3255.41	0.01
MC-12	PT6A-65	2	Ground Idle	Idle	156	1.77	1.06	117.85	7.89	3.95	2.16	3255.41	0.43
MC-12	PT6A-65	2	Approach	Approach	449	4.73	1.06	10.91	0.71	3.34	0.7	3255.41	0.08
MC-12	PT6A-65	2	Max Continuous	Climbout	612	8.18	1.06	3.88	0.20	4.30	0.61	3255.41	0.04
MC-12	PT6A-65	2	Max Continuous	Takeoff	612	8.18	1.06	3.88	0.20	4.30	0.61	3255.41	0.01
MH-60R/S	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25
MH-60R/S	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11
MH-60R/S	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08
MH-60R/S	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04
MQ-1A	TPE331-3	1	Idle	Idle	112	2.86	1.06	61.52	90.97	2.68	2.41	3255.41	0.50
MQ-1A	TPE331-3	1	Approach	Approach	250	8.92	1.06	6.96	0.74	2.40	2.16	3255.41	0.06
MQ-1A	TPE331-3	1	Climbout	Climbout	408	11.86	1.06	0.98	0.17	1.47	1.32	3255.41	0.01
MQ-1A	TPE331-3	1	Takeoff	Takeoff	458	12.36	1.06	0.76	0.13	1.75	1.57	3255.41	0.01
OV-10	T76-G-419	2	Idle	Idle	397	7.4	1.06	23.8	8.51	0.38	0.34	3255.41	0.50
OV-10	T76-G-419	2	Approach	Approach	476	8.5	1.06	17.2	0.92	0.50	0.45	3255.41	0.08
OV-10	T76-G-419	2	Intermediate	Climbout	794	9.9	1.06	5.9	0.12	0.63	0.57	3255.41	0.01
OV-10	T76-G-419	2	Military	Takeoff	857	10.3	1.06	2.3	0.12	0.71	0.64	3255.41	0.01
RC-135	F108-CF-201	4	Idle	Idle	1016	4	1.06	30.70	2.10	0.06	0.06	3255.41	0.80
RC-135	F108-CF-201	4	Approach	Approach	2468	8.2	1.06	4.20	0.09	0.06	0.05	3255.41	0.09
RC-135	F108-CF-201	4	Climbout	Climbout	6500	16	1.06	0.90	0.06	0.05	0.05	3255.41	0.03
RC-135	F108-CF-201	4	Takeoff	Takeoff	7818	18.5	1.06	0.90	0.05	0.07	0.06	3255.41	0.01
UH-60	T700-GE-700	2	Ground Idle	Idle	134	3.36	1.06	46.24	0.50	1.48	0.98	3255.41	0.25
UH-60	T700-GE-700	2	Flight Idle	Approach	469	10.95	1.06	5.12	0.02	1.26	0.07	3255.41	0.11
UH-60	T700-GE-700	2	Flight Max	Climbout	626	11.87	1.06	3.51	0.01	2.22	0.93	3255.41	0.08
UH-60	T700-GE-700	2	Overspeed	Takeoff	725	11.43	1.06	2.81	0.01	2.61	1.21	3255.41	0.04

Note: Emission factors are from the Air Emissions Guide for Air Force Mobile Sources, Table 2-8 (AFCEC 2014).

Aircraft Pollutant Emission	Combined Aircraft LTO Emissions for All Modes (lb / LTO)							Combined Aircraft Drop Zone Emissions for Approach and Landing (lb / LTO)						
Aircraft	NOx	SOx	CO	VOC	PM10	PM2.5	GHG	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
A-10	1.0	0.7	36.0	1.3	5.2	2.4	2210.1							
A-29	0.4	0.1	9.5	0.8	0.4	0.2	377.3							
AH-64	3.1	0.3	4.1	0.0	0.8	0.2	1050.5							
B-212	1.7	0.3	2.0	0.8	0.1	0.1	890.1							
C-130	8.7	2.0	50.2	36.7	1.6	1.4	6139.6	3.1	0.6	9.3	5.8	0.5	0.4	1786.9
Cessna 182	0.03	0.01	10.3	0.5	0.5	0.5	39.2							
CH-47	5.6	0.8	13.9	0.2	1.3	0.7	2469.3							
E-2C	4.3	1.0	25.1	18.3	0.8	0.7	3069.8							
E-3	17.4	3.9	259.9	237.3	20.4	18.3	11931.6							
E-8	18.6	4.1	217.9	186.0	15.9	14.3	12479.5							
EC-130	8.7	2.0	50.2	36.7	1.6	1.4	6139.6							
EC-725	3.1	0.3	4.1	0.0	0.6	0.2	1050.5							
HC-130	8.7	2.0	50.2	36.7	1.6	1.4	6139.6	3.1	0.6	9.3	5.8	0.5	0.4	1786.9
HC-130P/N/J	8.7	2.0	50.2	36.7	1.6	1.4	6139.6	3.1	0.6	9.3	5.8	0.5	0.4	1786.9
HH-60	3.1	0.3	4.1	0.0	0.6	0.2	1050.5							
HH-60G	3.1	0.3	4.1	0.0	0.6	0.2	1050.5							
KC-135	37.8	5.5	103.7	6.9	0.3	0.3	16747.9							
MC-12	1.1	0.3	16.9	1.1	1.0	0.4	858.6							
MH-60R/S	3.1	0.3	4.1	0.0	0.6	0.2	1050.5							
MQ-1A	0.4	0.1	3.5	5.1	0.2	0.2	256.3							
OV-10	3.7	0.5	10.5	3.4	0.2	0.2	1570.7							
RC-135	37.8	5.5	103.7	6.9	0.3	0.3	16747.9							
UH-60	3.1	0.3	4.1	0.0	0.6	0.2	1050.5							

Note: Emission factors are from the Air Emissions Guide for Air Force Mobile Sources, Table 2-8 (AFCEC 2014).

APU Emission Factors

Aircraft Model	Number of APUs	APU Model	APU Use (Hours)	APU Emission Factors in lb Pollutant per hour (lb/hr)						
				NOx	SOx	CO	VOC	PM10	PM2.5	GHG
A-10	1	GTCP 36-50	1	2.85	0.3	0.58	0.06	0	0	918.68
C-130	1	GTCP 85-180L	1	1.28	0.29	2.05	0.01	0.05	0.01	906.25
E-3	1	GTCP 165-1	2	1.22	0.29	3.76	0.49	0.13	0.04	910.75
E-8	1	GTCP 85	2	1.12	0.25	4.23	0.24	0	0	765.93
EC-130	1	GTCP 85-180L	1	1.28	0.29	2.05	0.01	0.05	0.01	906.25
HC-130	1	GTCP 85-180L	1	1.28	0.29	2.05	0.01	0.05	0.01	906.25

Note: Emission factors and APU usage and model information are from the Air Emissions Guide for Air Force Mobile Sources (AFCEC 2014).

AGE Emission Factors

Aircraft Model	Combined AGE Use (Hours)	AGE Emission Factors in lb Pollutant per each Landing-Takeoff Cycle (lb/LTO)						
		NOx	SOx	CO	VOC	PM10	PM2.5	GHG
A-10	23.0	58.2	2.1	51.5	26.3	7.1	7.1	2221.8
A-29	14.1	13.6	0.7	29.6	4.1	1.0	1.0	690.4
AH-64	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
B-212	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
C-130	32.8	105.6	4.1	38.7	4.3	1.7	1.7	3593.8
Cessna 182	3.2	4.6	0.2	4.5	0.4	0.1	0.1	237.3
CH-47	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
E-2C	50.8	114.6	4.5	42.8	7.5	1.7	1.7	4032.8
E-3	50.8	114.6	4.5	42.8	7.5	1.7	1.7	4032.8
E-8	50.8	114.6	4.5	42.8	7.5	1.7	1.7	4032.8
EC-130	32.8	105.6	4.1	38.7	4.3	1.7	1.7	3593.8
EC-725	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
HC-130	32.8	105.6	4.1	38.7	4.3	1.7	1.7	3593.8
HC-130PN/J	32.8	105.6	4.1	38.7	4.3	1.7	1.7	3593.8
HH-60	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
HH-60G	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
KC-135	34.4	99.8	6.3	14.0	2.7	1.1	1.1	2324.1
MC-12	0.8	4.6	0.1	0.1	0.2	0.1	0.1	146.4
MH-60R/S	20.5	52.9	2.4	23.0	2.6	0.8	0.8	1826.5
MQ-1A	60.0	298.7	9.7	21.8	10.3	4.3	4.3	9480.5
OV-10	23.0	58.2	2.1	51.5	26.3	7.1	7.1	2221.8
RC-135	34.4	99.8	6.3	14.0	2.7	1.1	1.1	2324.1
UH-60	19.5	52.4	2.4	22.8	2.4	0.8	0.8	1802.2

Note: Emission factors are from the Air Emissions Guide for Air Force Mobile Sources (AFCEC 2014).

Note: Common or generic equipment emission factors are used for all aircraft. AGE equipment includes generators, start carts, air conditioning units, heaters, test stands, light carts, air compressors, bomb lifts and tugs.

Rotary Wing Aircraft Downwash PM Emissions

	PM10 (lb/LTO)	PM2.5 (lb/LTO)
Rotary Wing LTO	3.3	3.3

Note: Emission factors from the 2007 paper Particulate Matter Emissions for Dust From Unique Military Activities by Gilles et. al.

Note: PM2.5 is assumed to be equivalent to PM10 for this analysis.

Aircraft Operations

Proposed Action - Implementation Phase

Total Combined Emissions Per LTO Cycle

Total LTO, APU and AGE Emissions in lb Pollutant per each Landing-Takeoff Cycle (lb/LTO)							
Aircraft Model	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
A-10	62.1	3.1	88.1	27.6	12.2	9.4	5350.5
A-29	14.0	0.8	39.1	4.7	1.5	1.2	1067.8
AH-64	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
B-212	54.7	2.7	25.1	3.4	4.2	4.2	2716.7
C-130	115.5	6.4	90.9	41.0	3.3	3.1	10639.7
Cessna 182	4.6	0.2	14.8	0.9	0.7	0.6	276.4
CH-47	58.6	3.2	37.0	2.8	5.5	4.8	4295.9
E-2C	118.9	5.5	67.9	25.9	2.4	2.4	7102.7
E-3	134.4	9.0	310.2	245.8	22.3	20.1	17785.9
E-8	135.4	9.1	269.2	194.0	17.5	15.9	18044.2
EC-130	115.5	6.4	90.9	41.0	3.3	3.1	10639.7
EC-725	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
HC-130	115.5	6.4	90.9	41.0	3.3	3.1	10639.7
HC-130P/N/J	114.2	6.1	88.9	41.0	3.2	3.1	9733.4
HH-60	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
HH-60G	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
KC-135	137.6	11.7	117.7	9.6	1.4	1.4	19072.0
MC-12	5.6	0.4	17.0	1.3	1.1	0.4	1005.0
MH-60R/S	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
MQ-1A	299.1	9.7	25.3	15.4	4.5	4.5	9736.8
OV-10	61.9	2.6	62.0	29.7	7.3	7.2	3792.5
RC-135	137.6	11.7	117.7	9.6	1.4	1.4	19072.0
UH-60	55.6	2.7	26.9	2.5	4.7	4.4	2852.6

Aircraft Operations

Proposed Action - Implementation Phase

Operations Assumptions:

- Guidance documents identify up to 600 sorties originating at Davis Monthan AFB and up to 200 sorties from unidentified alternate locations per exercise.
- Three representative outlying bases of operation were conservatively assumed for this analysis as the origin points for the 200 non-DMAFB sorties per exercise

600 Sorties from Davis Mon Southern Arizona and New Mexico Training Sites, Except Cochise County AZ

Approx. 90 Sorties from
Flagstaff KFLG Airport Northern Arizona Training Sites
Approx. 65 Sorties from
Libby Army Airfield at Fort Cochise County AZ Training Sites
Approx 45 Sorties from California Training
Halsey Field at Naval Air Sites

- Non Davis-Monthan-Based aircraft are split evenly between the three outlying bases of operation. Types of aircraft at each location are assigned based on the service who operates the aircraft and on the number and type of training locations in the surrounding area.
- Each aircraft not based at Davis Monthan AFB will have an additional LTO to account for arrival and departure from the outlying base of operation.

Landing and Takeoff (LTO) Cycles Per Year - Two Exercises:

Aircraft	Sorties	Arrival & Departure	Total LTO, APU, AGE and Downwash Emissions in lb Pollutant per each Landing-Takeoff Cycle (lb/LTO)									
	Davis Monthan AFB		NOx	SOx	CO	VOC	PM10	PM2.5	GHG			
A-10	280	N/A	62.1	3.1	88.1	27.6	12.2	9.4	5350.5			
A-29	40	N/A	14.0	0.8	39.1	4.7	1.5	1.2	1067.8			
AH-64	80	N/A	56.1	2.8	27.2	2.6	4.7	4.4	2877.0			
B-212	20	N/A	54.7	2.7	25.1	3.4	4.2	4.2	2716.7			
C-130	60	N/A	115.5	6.4	90.9	41.0	3.3	3.1	10639.7			
CH-47	80	N/A	58.6	3.2	37.0	2.8	5.5	4.8	4295.9			
E-3	20	N/A	134.4	9.0	310.2	245.8	22.3	20.1	17785.9			
E-8	20	N/A	135.4	9.1	269.2	194.0	17.5	15.9	18044.2			
EC-725	40	N/A	56.1	2.8	27.2	2.6	4.7	4.4	2877.0			
HC-130P/N/J	120	N/A	114.2	6.1	88.9	41.0	3.2	3.1	9733.4			
HH-60G	240	N/A	56.1	2.8	27.2	2.6	4.7	4.4	2877.0			
MC-12	40	N/A	5.6	0.4	17.0	1.3	1.1	0.4	1005.0			
OV-10	40	N/A	61.9	2.6	62.0	29.7	7.3	7.2	3792.5			
UH-60	120	N/A	55.6	2.7	26.9	2.5	4.7	4.4	2852.6			
DMAFB Total	1200	0										
	Other Airfields		Flagstaff IAP	Ft. Huachuca	NAS NI	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
AH-64	60	8	0	68	0	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
Cessna 182	24	12	20	8	8	4.6	0.2	14.8	0.9	0.7	0.6	276.4
E-2C	24	4	0	0	28	118.9	5.5	67.9	25.9	2.4	2.4	7102.7
EC-130	8	2	10	0	0	115.5	6.4	90.9	41.0	3.3	3.1	10639.7
HC-130	32	4	22	14	0	115.5	6.4	90.9	41.0	3.3	3.1	10639.7
HH-60	48	6	32	22	0	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
KC-135	32	8	24	16	0	137.6	11.7	117.7	9.6	1.4	1.4	19072.0
MH-60R/S	48	8	0	0	56	56.1	2.8	27.2	2.6	4.7	4.4	2877.0
MQ-1/9	12	4	10	6	0	299.1	9.7	25.3	15.4	4.5	4.5	9736.8
RC-135	12	2	14	0	0	137.6	11.7	117.7	9.6	1.4	1.4	19072.0
UH-60	100	16	92	24	0	55.6	2.7	26.9	2.5	4.7	4.4	2852.6
Other Total	400	74	224	158	92							
GRAND TOTAL	1600	74										

Note: Aircraft operating at Davis-Monthan AFB are assumed to be home-based there. All other aircraft are assumed to arrive at their bases at the beginning of the exercise and take-off at the completion.

Emissions Results

LTO Emissions		Total LTO Emissions tons per year (ton/yr)						
Airfields	County	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
Davis Monthan AFB	Pima	39.7	2.1	36.8	13.4	4.0	3.4	3015.9
Flagstaff IAP	Coconino	9.5	0.5	5.6	1.1	0.4	0.4	761.3
Ft. Huachuca	Cochise	6.0	0.3	3.3	0.6	0.3	0.3	421.1
NAS NI	San Diego	3.3	0.2	1.8	0.4	0.2	0.2	181.1
Totals		58.38	3.09	47.45	15.51	4.88	4.24	4379.38

Assumptions:

- Two exercises per year.
- All sorties have only a single sortie-operation.
- Training site activities are based primarily on the training activity notes contained in the DOPAA and AF 813 forms associated with the AT exercise. If no notes were present, activities were assumed based on the training site designation (DZ/HLZ/LZ).
- A-10, A-29, AH-64 and OV-10 training missions are assumed conducted within the ranges at BMGR and other MOAs and all low-level air emissions are assumed accounted for in the NEPA analyses. Only LTO emissions for A-10, A-29, AH-64 and OV-10 sorties are accounted for in this analysis.
- E-3, E-8, Cessna 182, E-2C, EC-130, KC-135, MQ-9 and RC-135 training operations are all assumed to be conducted above 3,000 feet and do not contribute to ground-level air emissions.
- Fixed wing sorties in a given region are prioritized to go to LZs first and then DZs. If there are not enough fixed wing sorties in a region to go to each LZ and DZ at least once, rotary wing sorties are assumed to perform a portion of the drops at DZs.
All fixed wing drop sorties will consist of an approach and climbout portion of an LTO cycle at the training site. Any rotary wing drops consist of one LTO cycle at the training site.
- All HLZ sorties consist of two LTO cycles at the training site.
- All LZ sorties will consist of a single LTO cycle without APU or AGE equipment.
- FARP locations are assumed to consist of either truck to aircraft or aircraft to aircraft JP-8 / Jet-A refueling at established fuel handling facilities. All emissions from such activities are assumed to be insignificant (< 0.01 lb VOC / 1000 lb fuel) and/or accounted for in each facility's existing emissions analysis or budget.
- Because the exact number of sorties to each location is unknown in advance, the total training site emissions for each activity type (DZ, HLZ, LZ) will be proportioned by county based on the number of assumed aircraft sorties in the region and number of total sites in the region.

Training Site Emissions		Total Training Site Emissions tons per year (ton/yr)						
Region	County	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
Southern Arizona	Cochise	0.16	0.03	0.5	0.26	0.14	0.13	70.07
Southern Arizona	Gila	0.07	0.01	0.11	0.00	0.29	0.26	22.18
Southern Arizona	Graham	0.03	0.00	0.05	0.00	0.26	0.24	11.09
Southern Arizona	Maricopa	0.67	0.09	1.41	0.33	0.75	0.68	249.24
Southern Arizona	Pima	0.15	0.02	0.31	0.06	0.35	0.32	55.69
Southern Arizona	Pinal	0.09	0.01	0.22	0.08	0.30	0.27	37.57
Southern Arizona	Santa Cruz	0.23	0.03	0.45	0.09	0.42	0.37	83.94
Northern Arizona	Apache	0.05	0.01	0.16	0.07	0.04	0.04	20.25
Northern Arizona	Coconino	0.24	0.03	0.65	0.26	0.23	0.21	82.87
Northern Arizona	Gila	0.02	0.00	0.02	0.00	0.02	0.02	5.43
Northern Arizona	Greenlee	0.02	0.00	0.03	0.00	0.03	0.02	6.63
Northern Arizona	Mohave	0.02	0.00	0.08	0.04	0.02	0.02	9.82
Northern Arizona	Navajo	0.03	0.00	0.08	0.04	0.02	0.02	11.03
New Mexico	Catron	0.40	0.05	0.84	0.21	0.40	0.36	148.95
New Mexico	Curry	0.05	0.007	0.14	0.05	0.04	0.04	20.40
New Mexico	Dona Ana	0.05	0.007	0.14	0.05	0.04	0.04	20.40
New Mexico	Hidalgo	0.05	0.007	0.14	0.05	0.04	0.04	20.40
California	Imperial	0.010	0.001	0.02	0.0005	0.002	0.0010	2.99
California	Los Angeles	0.029	0.003	0.05	0.0007	0.31	0.20	8.92
California	Orange	0.020	0.002	0.03	0.0002	0.02	0.02	5.93
California	Riverside	0.010	0.001	0.02	0.0005	0.28	0.17	2.99
California	San Diego	0.055	0.006	0.09	0.001	0.61	0.39	16.85
California	Ventura	0.010	0.001	0.02	0.0005	0.28	0.17	2.99
Totals		2.47	0.33	5.57	1.61	4.90	4.02	926.62

Aircraft Operations

Proposed Action - Implementation Phase

Total Emissions By County		Total Air Operations Emissions tons per year (ton/yr)						
Region	County	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
Southern Arizona	Cochise	6.18	0.35	3.79	0.82	0.46	0.42	445.56
Southern Arizona	Gila	0.07	0.008	0.11	0.002	0.29	0.26	20.12
Southern Arizona	Graham	0.03	0.004	0.05	0.0009	0.26	0.24	10.06
Southern Arizona	Maricopa	0.67	0.09	1.41	0.33	0.75	0.68	226.11
Southern Arizona	Pima	39.81	2.08	37.09	13.50	4.35	3.73	2786.50
Southern Arizona	Pinal	0.09	0.01	0.22	0.08	0.30	0.27	34.08
Southern Arizona	Santa Cruz	0.23	0.03	0.45	0.09	0.42	0.37	76.15
Northern Arizona	Apache	0.05	0.01	0.16	0.07	0.04	0.04	18.37
Northern Arizona	Coconino	9.69	0.58	6.29	1.34	0.64	0.59	774.90
Northern Arizona	Gila	0.02	0.002	0.02	0.0002	0.02	0.02	4.92
Northern Arizona	Greenlee	0.02	0.002	0.03	0.0003	0.03	0.02	6.02
Northern Arizona	Mohave	0.02	0.004	0.08	0.04	0.02	0.02	8.91
Northern Arizona	Navajo	0.03	0.004	0.08	0.04	0.02	0.02	10.00
New Mexico	Catron	0.40	0.05	0.84	0.21	0.40	0.36	135.12
New Mexico	Curry	0.05	0.007	0.14	0.05	0.04	0.04	18.51
New Mexico	Dona Ana	0.05	0.007	0.14	0.05	0.04	0.04	18.51
New Mexico	Hidalgo	0.05	0.007	0.14	0.05	0.04	0.04	18.51
California	Imperial	0.01	0.001	0.02	0.0005	0.002	0.001	2.71
California	Los Angeles	0.03	0.003	0.05	0.001	0.31	0.20	8.09
California	Orange	0.02	0.002	0.03	0.0002	0.02	0.02	5.38
California	Riverside	0.01	0.001	0.02	0.0005	0.28	0.17	2.71
California	San Diego	3.31	0.16	1.86	0.44	0.78	0.55	179.58
California	Ventura	0.01	0.001	0.02	0.0005	0.28	0.17	2.71
Totals		60.8	3.4	53.0	17.1	9.8	8.3	4813.5

Aircraft Operations
Proposed Action - Implementation Phase

Ground Operations for the Preferred Alternative - Angel Thunder Training Exercise

Given: - Six tactical vehicles of the LDDT class will operate for five hours each at each training site capable of C4I or Logistics operations. All other ground training sites are assumed to have no ground vehicle presence. The three forward operating bases will allocate twenty tactical vehicles in the LDDT class and twelve tactical vehicles in the HDDT class for twelve hours per day for each of the entire 14 day training periods.

All personnel will arrive via aircraft to the assigned base of operations.

Assumptions: - A Gross Vehicle Weight (GVW) of 5,900 lbs (fully loaded HMMWV) will be used for the LDDT class vehicles .
- A Gross Vehicle Weight (GVW) of 70,000 lbs (fully loaded R-11 refueler equivalent) will be used for the HDDT class vehicles
- Training site vehicles will spend 100% of the time driving at an average of 40 miles per hour.
- On-base vehicles will spend 67% of operations idling and 33% traveling at an average of 30 miles per hour.
- Training site roads will be unpaved.
- Operating base roads will be paved.

Vehicle Weight Classes for Which Emission Factors are Published

Vehicle Category	Description	SCC
LDDT	Light-Duty Diesel Trucks 1-4 (0-8,500 lbs GVW)	A2230002000
HDDV	Heavy-Duty Diesel Vehicles (8501+ lbs GVW)	A2230070000

Emission Factors - Tactical Vehicle Ground Activity for the Preferred Alternative - Angel Thunder Training Exercise

Driving Emission Factors for Calendar Year 2016

Vehicle Class	Estimation Year	Emission Factors in grams per mile (g/mi)										
		NOx	SOx	CO	VOC	PM10	PM2.5	GHG	Unpaved Fugitive PM10	Unpaved Fugitive PM2.5	Paved Fugitive PM10	Paved Fugitive PM2.5
LDDT	2016	0.342	0.006	0.614	0.32	0.049	0.034	598.6	50.595	50.595	0.069	0.017
HDDV	2016	2.038	0.012	1.544	0.583	0.079	0.053	1245.2	50.595	50.595	0.069	0.017

Note: All information is from the Air Emissions Guide for Air Force Mobile Sources, Tables 5-8 and 5-36 (AFCEC 2014).

Note: Emission factors are conservatively assumed to be for high altitude operation in Arizona.

Note: GHG emission factor is for CO2 only.

Idling Emission Factors for Calendar Year 2016

Vehicle Class	Emission Factors in grams per hour (g/hr)						
	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
LDDT	6.8		11.4	4.7			
HDDV	55.9		94.3	12.6	2.58	2.37	

Note: All information is from the Air Emissions Guide for Air Force Mobile Sources, Tables 5-6 (AFCEC 2014).

Emission Calculations - Tactical Vehicle Ground Activity for the Preferred Alternative - Angel Thunder Training Exercise

Miles for Tactical Vehicles at Training Sites

Vehicle Class	Number of Vehicles	Average Speed (mi/hr)	Hours Driving	Hours Idling	Total Days	Total Miles Driven	Total Hours Idling
LDDT	6	40	5	0	2	2,400	0

Miles for Tactical Vehicles at Operating Bases

Vehicle Class	Number of Vehicles	Speed Miles/hour	Hours Driving	Hours Idling	Total Days	Total Miles Driven	Total Hours Idling
LDDT	20	30	4	8	28	67,200	4,480
HDDT	12	30	4	8	28	40,320	2,688

Criteria and VOC Emissions Tactical Vehicles at each Training Site

Vehicle Class	Year	Criteria Pollutant Emissions (tons/year)						
		NOx	SOx	CO	VOC	PM10	PM2.5	GHG
LDDT	2016	0.0009	0.000016	0.0016	0.0008	0.134	0.134	1.58
Total		0.0009	0.000016	0.0016	0.0008	0.134	0.134	1.58

Criteria and VOC Emissions Tactical Vehicles at each Operating Base

Vehicle Class	Year	Per-Site Miles	Criteria Pollutant Emissions (tons/year)						
			NOx	SOx	CO	VOC	PM10	PM2.5	GHG
LDDT	2016	67,200	0.059	0.0004	0.10	0.05	0.009	0.004	44.349
HDDT	2016	40,320	0.256	0.0005	0.35	0.06	0.014	0.010	55.353
Total			0.32	0.0010	0.45	0.11	0.02	0.014	99.70

Total Emissions By County		Total Tactical Vehicle Emissions tons per year (ton/yr)						(Mg/yr)
Region	County	NOx	SOx	CO	VOC	PM10	PM2.5	GHG
Southern Arizona	Cochise	0.32	0.001	0.45	0.11	0.42	0.42	94.76
Southern Arizona	Gila	0	0	0	0	0	0	0
Southern Arizona	Graham	0	0	0	0	0	0	0
Southern Arizona	Maricopa	0.005	0.00008	0.008	0.004	0.67	0.67	7.18
Southern Arizona	Pima	0.32	0.001	0.45	0.11	0.42	0.42	94.76
Southern Arizona	Pinal	0.00	0.00003	0.003	0.002	0.27	0.27	2.87
Southern Arizona	Santa Cruz	0.0009	0.00002	0.002	0.001	0.13	0.13	1.44
Northern Arizona	Apache	0.005	0.00008	0.008	0.004	0.67	0.67	7.18
Northern Arizona	Coconino	0.35	0.002	0.51	0.14	4.98	4.97	143.61
Northern Arizona	Gila	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
Northern Arizona	Greenlee	0.002	0.00003	0.003	0.002	0.27	0.27	2.87
Northern Arizona	Mohave	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
Northern Arizona	Navajo	0.002	0.00003	0.003	0.002	0.27	0.27	2.87
New Mexico	Catron	0.008	0.00014	0.015	0.008	1.21	1.21	12.93
New Mexico	Curry	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
New Mexico	Dona Ana	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
New Mexico	Hidalgo	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
California	Imperial	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
California	Los Angeles	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
California	Orange	0.002	0.00003	0.003	0.002	0.27	0.27	2.87
California	Riverside	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
California	San Diego	0.32	0.001	0.46	0.11	0.69	0.68	97.63
California	Ventura	0.0009	0.00002	0.002	0.0008	0.13	0.13	1.44
Totals		1.34	0.005	1.94	0.51	11.48	11.44	483.93

Emission Calculations Method - Tactical Vehicle Ground Activity for the Preferred Alternative - Angel Thunder Training Exercise

Calculation Method: $E(\text{Pol})_{\text{total}} = \text{VMT}_{\text{total}} \times \text{EF}(\text{Pol})_{\text{total}} \times 0.002205$

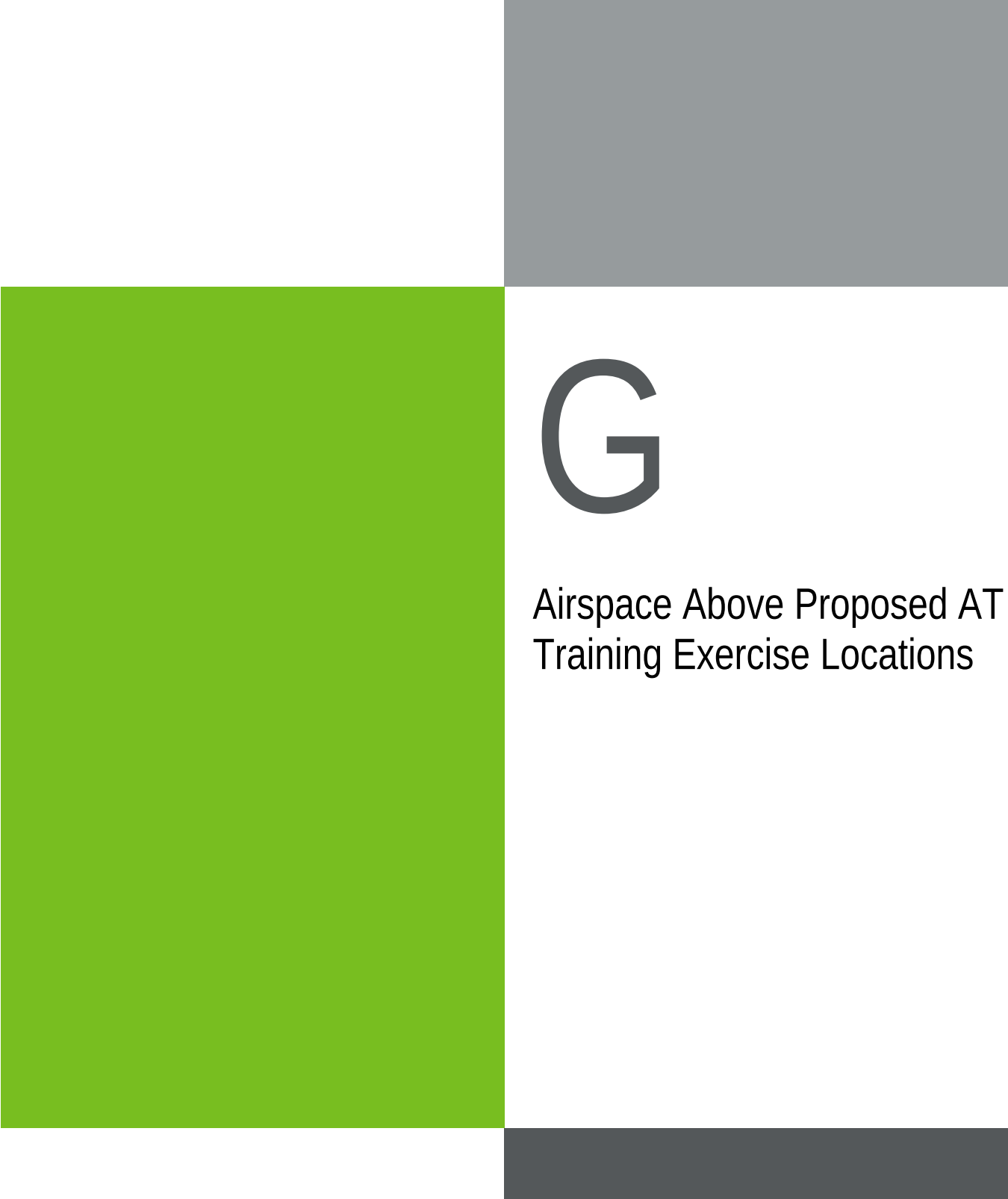
Where,

$E(\text{Pol})_{\text{total}}$ = Total annual emissions of specific pollutant from vehicle exhaust (lb/yr)

$\text{VMT}_{\text{total}}$ = Total annual vehicle miles traveled for all POV or GCV (mi/yr).

$\text{EF}(\text{Pol})_{\text{total}}$ = Total adjusted AF/state composite emission factor for specific pollutant (g/mi).

0.002205 = Factor for converting grams to pounds (lb/g)



G

Airspace Above Proposed AT
Training Exercise Locations

Appendix G: Airspace Above Proposed AT Training Exercise Locations

Table G-1 outlines airspace characteristics of the proposed AT training exercise locations in southern Arizona that are displayed on FAA VFR Sectional maps.

Table G-1. Airspace Characteristics of Proposed AT Training Exercise Locations in Southern Arizona

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Military Installations						
Aux 6	D (see NOTAMS/ Supplement for Class D effective hours)	V66, V94, V461	VR223, VR267-269, VR242-268, IR218	Sells 1, Sells Low	R-2301E ² , R-2304 ² , R-2305 ²	1, 2, 3, 4, 5, 6, 7, 8
Aux Circular	D (see NOTAMS/ Supplement for Class D effective hours)	V66, V94, V461	VR223, VR267-269, VR242-268, IR218	Sells 1, Sells Low	R-2301E ² , R-2304 ² , R-2305 ²	1, 2, 3, 4, 5, 6, 7
Aux Rectangular	D (see NOTAMS/ Supplement for Class D effective hours)	V66, V94, V461	VR223, VR267-269, VR242-268, IR218	Sells 1, Sells Low	R-2301E ² , R-2304 ² , R-2305 ²	1, 2, 3, 4, 5, 6, 7
DM AFB	C	V16, V105, V94, V393, V395, T306, T310	VR267-268-269, VR259, VR260, VR263, VR1233, VR259	Outlaw, Jackal, Jackal Low, Sells 1, Sells Low, Ruby 1, Fuzzy, and Tombstone C	R-2303 A/B/C, R-2312	1, 2, 3, 4, 5, 6, 7, 8
DM AFB CATM	C	V16, V105, V94, V393, V395, T306, T310	VR267-268-269, VR259, VR260, VR263, VR1233, VR259	Outlaw, Jackal, Jackal Low, Sells 1, Sells Low, Ruby 1, Fuzzy, and Tombstone C	R-2303 A/B/C, R-2312	4, 5
Florence	B (ZAB Air ARTCC regulated when R-2310A inactive)	V16	VR267_C_D	within Outlaw (excludes airspace within R-2310A, B, & C when active)	• within R-2310A² • near R-2310A/B² & R-2310SA/C	2, 3, 4, 5, 6, 7, 8
Gila Bend Air Force Auxiliary Base	D (see NOTAMS/Supplement for Class D effective hours)	V66, V94, V461	VR223, VR267-269, VR242-268, IR218	Sells 1, Sells Low	R-2301E, R-2304, R-2305	1, 2, 3, 4, 5, 6, 7, 8

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Military Installations (continued)						
Hubbard	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R-2303 A & B² • near R-2303B², R-2312, R-2303C²	1, 2, 3, 4, 5, 6, 7, 8
Hubbard (Tombstone)	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R-2303 A & B² • near R- 2303B², R-2312, R-2303C²	1, 2, 3, 4, 5, 6, 7, 8
Humor	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R 2303 A & B² • near R- 2303B², R- 2312, R-2303C²	2, 3, 4, 5
Libby AAF	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R-2303 A & B² • near R- 2303B², R- 2312, R-2303C²	1, 2, 3, 4, 5, 6, 7, 8
NATO Hill (WPT 74)	ZAB Air ARTCC regulated when R-2304 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2304² • near R-2301E² & R-2305²	2, 4, 5
OP Charlie	ZAB Air ARTCC regulated when R-2304 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2304² • near R-2301E² & R-2305²	2, 4, 5
Range 3 –HLZ 1	ZAB Air ARTCC regulated when R-2305 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2305² • near R-2301E² & R-2304²	2, 4, 5

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Military Installations (continued)						
Range 3 – HLZ 2	E			Gladden 1	• within A-231 (excludes below 4,000 feet AGL within Phoenix Luke AFB Class D)	2, 4, 5
Range 3 – HLZ 3	ZAB Air ARTCC regulated when R-2305 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2305² • near R-2301E² & R-2304²	2, 4, 5
Range 3 – HLZ 4	ZAB Air ARTCC regulated when R-2305 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2305² • near R-2301E² & R-2304²	2, 4, 5
Range 3 – HLZ 5	E			Gladden 1	• within A-231 (excludes below 4,000 feet AGL within Phoenix Luke AFB Class D)	2, 4, 5
Range 3 – HLZ 6	ZAB Air ARTCC regulated when R-2305 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2305² • near R-2301E² & R-2304²	2, 4, 5
Range 3 -Tower Helipad	ZAB Air ARTCC regulated when R-2305 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2305² • near R-2301E² & R-2304²	2, 4, 5
South Tactical Range	ZAB Air ARTCC regulated when R-2304 inactive		VR231, VR243, VR244, VR245	Sells 1 & Sells Low	• within R-2301E² • near R-2301W², R-2304², & R-2305²	2, 4, 5
Target 333	ZAB Air ARTCC regulated when R-2304 inactive		VR223-239-259	• within Sells 1 • near Sells Low	• within R-2304² • near R-2301E² & R-2305²	2, 3, 4, 5

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Military Installations (continued)						
Tombstone Circular	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R-2303 A & B • near R-2303B, R-2312, R-2303C	2, 3, 4, 5
Tombstone Rectangular	D or E (see NOTAMs/ Supplement for Class D/E effective hours)	V66, V393, V395	VR259, VR260, VR263	Tombstone A & C, Tombstone C, Tombstone B & C, Ruby 1, and Fuzzy	• within R-2303 A & B • near R-2303B, R-2312, R-2303C	2, 3, 4, 5
U.S. Forest Service						
Canelo (Coronado NF)	E	V66, V393, V395	VR259, VR260, VR263	Ruby 1, Fuzzy, & Tombstone C	• within R-2303A&B • near R-2303B, R-2303C, & R-2312	2, 3, 4, 5
Devon (Coronado NF)	ZAB Air ARTCC regulated when Ruby 1 & Fuzzy MOAs are inactive		VR259, VR260, VR263	• within Ruby 1 and Fuzzy • near Sells 1 & Sells Low	2303A & B and R 2303B	2, 4, 5
Mesa (Coronado NF)	G	V94, V-16, T310	VR259, VR260, VR263, VR267-268- 269, VR1233	Jackal, Jackal Low, Outlaw, and Morenci		2, 4, 5
Mt. Lemon (USFS Emergency Helipad) (Coronado NF)	G	V94	VR259, VR260, VR263, VR267-268-269, VR1233	Jackal, Jackal Low, Outlaw,		2, 4, 5, 6, 7
Ranger (Coronado NF)	ZAB Air ARTCC regulated when Tombstone A & C MOA inactive	V66, T306, T310	VR259, VR263	• within Tombstone A & C • near Tombstone C, Tombstone B & C	R-2303C	2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
U.S. Forest Service (continued)						
Saddle Mtn. East (Coronado NF)	ZAB Air ARTCC regulated when R-2303A&B inactive	V66, V393, V395	VR259, VR260, VR263	Ruby 1, Fuzzy, Tombstone C	• within R-2303A &B • near R-2303B, R-2303C, R-2312	2, 3, 4, 5
Saddle Mtn. South (Coronado NF)	ZAB Air ARTCC regulated when R-2303B inactive	V66, V393, V395	VR259, VR260, VR263	Ruby 1, Fuzzy, Tombstone	• within R-2303B • near R-2303 A &B, R-2303C, R-2312	2, 3, 4, 5
Saddle Mtn. West (Coronado NF)	ZAB Air ARTCC regulated when R-2303A&B inactive	V66, V393, V395	VR259, VR260, VR263	Ruby 1, Fuzzy, Tombstone C	• within R-2303A &B • near R-2303B, R-2303C, R-2312	2, 3, 4, 5
Miscellaneous						
Bisbee-Douglas IAP	E (see NOTAMS/ Supplement for Class E Effective hours)	V66	VR259, VR263	• within Tombstone C • near Tombstone A&C and B&C	R-2303 A & B, R-2303C, R-2312	1, 2, 3, 4, 5, 6, 7, 8
Coolidge MAP	E	V16, V94, V105, T306	VR241, VR241-244, VR239-244, VR267-268-269	Outlaw	R-2310A, R-2310A/B, R-2310A/C	1, 2, 3, 4, 5, 6, 7, 8
Eloy North	E	V16, V94, V105, T306	VR241, VR239-244,	Outlaw	R-2310 A, R-2310A/B, R-2310A/C	3, 4, 5, 7
Eloy South	E	V16, V94, V105, T306	VR241, VR239-244,	Outlaw	R-2310 A, R-2310A/B, R-2310A/C	3, 4, 5, 7
Highway 80 Paladins (TW 2 Paladins)	ZAB Air ARTCC regulated when Tombstone B & C MOA inactive	V66	VR259, VR263	• within Tombstone B&C • near Tombstone C and Tombstone A&C	R-2303C	2, 3, 4, 5
Little Outfit	ZAB Air ARTCC regulated when R-2303A&B inactive	V66, V393, V395	VR259, VR260, VR263	Ruby 1, Fuzzy, Tombstone C	• within R-2303A &B • near R-2303B, R-2303C, R-2312	1, 2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Miscellaneous (continued)						
Phoenix Sky Harbor IAP	B	V16, V66, V94, V95, V105, V190, V257, T306, V327-562-567, V461, V528	VR223, VR231, VR239, VR241, VR242, VR243, VR244, VR245	Gladden 1, Outlaw, Sells Low, and Sells 1	A-231; R-2301 E; R 2304; R-2305, R-2310A; R-2310A, B; R-2310 B, C	1, 6, 7
Pima County Emergency Operations	C	V16, V105, V94, V393, V395, T306, T310	VR267-268-269, VR259, VR260, VR263, VR1233, VR259	Outlaw, Jackal, Jackal Low, Sells 1, Sells Low, Ruby 1, Fuzzy, and Tombstone C	R-2303 A/B/C, R-2312	6
Pima County Regional Training Center	C	V16, V105, V94, V393, V395, T306, T310	VR267-268-269, VR259, VR260, VR263, VR1233, VR259	Outlaw, Jackal, Jackal Low, Sells 1, Sells Low, Ruby 1, Fuzzy, and Tombstone C	R-2303 A/B/C, R-2312	4
Ruby Fuzzy Paladins	ZAB Air ARTCC regulated when Ruby 1 & Fuzzy MOAs are inactive		VR259, VR260, VR263	• within Ruby 1 and Fuzzy • near Sells 1 & Sells Low	2303A & B and R 2303B	2, 3, 4, 5
Scottsdale Osborne	B	V16, V66, V94, V95, V105, V190, V257, T306, V327-562-567, V461, V528	VR223, VR231, VR239, VR241, VR242, VR243, VR244, VR245	Gladden 1, Outlaw, Sells Low, and Sells 1	A 231; R-2301 E; R 2304; R-2305, R-2310A; R-2310A, B; R-2310 B, C	2
Three Points Public Shooting Range	E	V105, T306	VR223, VR239-244, VR259, VR260	Sells Low, Sells 1, Ruby 1, Fuzzy		4
Tombstone Paladins	ZAB Air ARTCC regulated when Tombstone A & C MOA inactive	V66, T306, T310	VR259, VR263	• within Tombstone A & C • near Tombstone C, Tombstone B & C	R-2303C	2, 3, 4, 5

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Areas	Training Activity (Key below)
Miscellaneous (continued)						
UA Medical Center	C	V16, V105, V94, V393, V395, T306, T310	VR267-268-269, VR259, VR260, VR263, VR1233, VR259	Outlaw, Jackal, Jackal Low, Sells 1, Sells Low, Ruby 1, Fuzzy, and Tombstone C	R-2303 A/B/C, R-2312	2
Salt River High	G	V190, V528	VR239	Outlaw and Jackal		2, 4, 5
Salt River Low	G	V190, V528	VR239	Outlaw and Jackal		2, 4, 5
Saguaro Lake Ranch	B	V95, V190, V528	VR244	Outlaw	R-2310A; R-2310 A,B; R-2310 A,C	2, 4, 5
Verde River	B	V95, V190, V528	VR244	Outlaw	R-2310A; R-2310 A,B; R-2310 A,C	2, 4, 5

Sources: VFRmap 2016, BDIAP 2014, CMA 2011

Notes:

¹ Airspace Class G is only existing up the floor of overlying Class E airspace. Overlying airspace is Class E if not otherwise designated as A, B, C, or D. Class G was listed as the airspace class for a location if no symbol representing the floor of the overlying Class E airspace is present on the FAA VFR Sectional map (i.e., VFRmap 2016) or if the area is not within a MOA or RA; therefore, the floor of the overlying Class E airspace in these locations is assumed to be 14,500 feet MSL.

² Restricted Airspace for ISR use to include unmanned aircraft

Key: AAF = Army Airfield, NF = National Forest; IAP = International Airport; MAP = Municipal Airport; MSL = mean sea level; UA = University of Arizona; Mtn. = Mountain

Training Activity Key:

- | | |
|---|--|
| 1. Fixed-Wing Terminal Area Operations | 6. Command, Control, Communications, Computers, and Intelligence Operations Location |
| 2. Rotary-Wing Terminal Area Operations | 7. Logistical / Beddown location |
| 1. Parachute Operations | 8. Forward Aircraft Refueling Point |
| 4. Dismounted Ground / Water Operations | |
| 5. Dismounted Ground / Water Movement | |

Table G-2 outlines airspace characteristics of the proposed AT training exercise locations in northern Arizona that are displayed on FAA VFR Sectional maps. All controlled airspace and RAs within the project area in northern Arizona are controlled by ZAB ARTCC or ZLA ARTCC. For this reason, the controlling ARTCC is included in parenthesis next to the airspace class or MOA (if the controlling ARTCC differs from that of the training location it is near) in **Table G-2**.

Table G-2. Airspace Characteristics of Proposed AT Training Exercise Locations in Northern Arizona

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Military Installations						
Camp Navajo Army Base	G (ZAB ARTCC controlled once at floor of overlying Class E airspace)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Fort Tuthill	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	7
L Tank	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Metz Tank	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Navajo East	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Navajo Railroad	G (ZAB ARTCC controlled once at floor of overlying Class E airspace)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Navajo West	G (ZAB ARTCC controlled once at floor of overlying Class E airspace)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Neill Flat	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Military Installations (continued)						
Rogers Lake (Logger Camp)	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Rodgers Napier	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7
Rodgers Wren	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7
USFS						
Black Mesa – USFS Helitack Base (Apache-Sitgreaves NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V95, V12-264, V567	IR112	Sunny		2, 3, 4, 5, 6, 7
Comanche (Coconino NF)	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	
Elk (Coconino NF)	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	
Flagstaff Hotshot – USFS Helitack Base (Coconino NF)	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Hannagan Meadow – USFS Helitack Base (Apache-Sitgreaves NF)	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
USFS (continued)						
Helibase Circular (Apache-Sitgreaves NF)	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5, 6, 7
Jacks Canyon (Coconino NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V95, V12-264, V567	IR112	Sunny		2, 4, 5
KP Circular (Apache-Sitgreaves NF)	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5
KP Tank (Apache-Sitgreaves NF)	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5
Longview- USFS Helitack Base (Coconino NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V95, V327, V567				2, 3, 4, 5, 6, 7
Mogollon Rim (General Crook) (Apache Sitgreaves NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V95, V327, V567				2, 4, 5
Mohawk (Kaibab NF)	D or E (ZLA ARTCC) (see NOTAMs/Supplement for Class D/E effective hours)	V208, V210, V257, V293		Sunny (ZAB ARTCC)	within SFAR 50-2	
Mormon Lake – USFS Helitack Base (Coconino NF)	E (ZAB ARTCC)	V12-264, V291, V327, V567	IR112,	Sunny		2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
USFS (continued)						
Overgaard – USFS Helitack Base (Apache-Sitgreaves NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V528, V190	IR320			2, 3, 4, 5, 6, 7
Payson-RimSide (Tonto NF)	E (ZAB ARTCC)	V95, V327, V528, V567				
Pittman Valley (Kaibab NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V257, V291		Sunny	R-2302	2, 3, 4, 5, 6, 7
Roosevelt Lake (Tonto NF)	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V190, V528	VR239, VR241, VR244	Outlaw and Jackal		2, 3, 4, 5
Rough Rider (Coconino NF)	E (ZAB ARTCC)	V12-264, V291, V327, V567	IR112,	Sunny		2, 4, 5
Tribeland (Kaibab NF)	D or E (ZLA ARTCC) (see NOTAMs/Supplement for Class D/E effective hours)	V208, V210, V257, V293		Sunny (ZAB ARTCC)	within SFAR 50-2	2, 3, 4, 5
Miscellaneous						
Babbitt Ranch 1	ZLA Air ARTCC regulated when Sunny MOA inactive	V208, V210, V257, V291	IR112	within Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Babbitt Ranch 2	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V210, V257, V291	IR112	Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Babbitt Ranch 3	ZLA Air ARTCC regulated when Sunny MOA inactive	V208, V210, V257, V291	IR112	within Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Bone Crusher	E (ZLA ARTCC)	V208, V210, V257, V291		Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Caldwell Meadows (Apache-Sitgreaves NF)	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5, 6

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Miscellaneous (continued)						
Cattle	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V12-264, V291, V327, V572	IR112	Sunny	R-2302	2, 3, 4, 5, 6, 7
Cattle LTFW	ZLA Air ARTCC regulated when Sunny MOA inactive	V208, V210, V257, V291	IR112	within Sunny (ZAB ARTCC)	within SFAR 50-2	1, 2, 4, 5, 6, 7
Colorado River	E (ZLA ARTCC)	V135, V208, V210, V237,	IR213, IR213-217, VR1265	Turtle & Bristol (ZLA ARTCC), Bagdad 1 (ZAB ARTCC)		4, 5
Flagstaff Pulliam AP	D (ZAB ARTCC) (see NOTAMS/Supplement for Class D effective hours)	V12-264, V257, V291, V572, V327	IR112,	Sunny	R-2302	1, 2, 4, 5, 6, 7
FR 320/311	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V210, V257, V291	IR112	Sunny (ZAB ARTCC)	within SFAR 50-2	1, 2, 3, 4, 5, 6, 7
Gerbil	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V210, V257, V291	IR112	Sunny (ZAB ARTCC)	within SFAR 50-2	2, 3, 4, 5, 6, 7
Gila Co. Roosevelt Substation	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V190, V528	VR239, VR241, VR244	Outlaw and Jackal		2, 3, 4, 5, 6, 7
Grand Canyon NP AP	D or E (ZLA ARTCC) (see NOTAMS/Supplement for Class D/E effective hours)	V208, V210, V257, V293		Sunny (ZAB ARTCC)	within SFAR 50-2	1, 2, 4, 5, 6, 7
Grand Canyon Valle AP	E (ZLA ARTCC)	V208, V210. V257, V291		Sunny (ZAB ARTCC)	within SFAR 50-2	1, 2, 3, 4, 5, 6, 7
H.A. Clark Memorial Field AP	G (ZAB ARTCC regulated once at floor of overlying class E airspace)	V257, V291		Sunny	R-2302	1, 2, 3, 4, 5, 6, 7
HLZ 5	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V12-264, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Miscellaneous (continued)						
HLZ 6	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V12-264, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7
HLZ 7	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V12-264, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7
HLZ 8	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V12-264, V291, V327, V572	IR112	Sunny	R-2302	2, 4, 5, 6, 7
Kingman AP	E (ZLA ARTCC)	V105, V208, V210	VR243, VR1268, IR213, IR214	Turtle (ZLA ARTCC) and Bagdad 1 (ZAB ARTCC)	SFAR 50-2	1, 2, 3, 4, 5, 6, 7
Lee's Ferry	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V293,			within SFAR 50-2	1, 2, 3, 4, 5, 6, 7
Panda	ZLA Air ARTCC regulated when Sunny MOA inactive	V208, V210, V257, V291	IR112	within Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Powerline	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V210, V257, V291	IR112	Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Sage	D or E (ZLA ARTCC) (see NOTAMs/Supplement for Class D/E effective hours)	V208, V210, V257, V293		Sunny (ZAB ARTCC)	within SFAR 50-2	2, 3, 4, 5, 6, 7
Sinkhole	ZLA Air ARTCC regulated when Sunny MOA inactive	V208, V210, V257, V291	IR112	within Sunny (ZAB ARTCC)	within SFAR 50-2	2, 4, 5, 6, 7
Springerville AP	E (ZAB ARTCC)	V190	VR176, IR320	Jackal, Reserve, Cato, Smitty		1, 2, 3, 4, 5, 6, 7
Sprucedale Guest Ranch	ZAB ARTCC regulated when Reserve MOA inactive		VR176	• within Reserve • near Jackal, Jackal Low, Cato, Morenci, Smitty		2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Miscellaneous (continued)						
Squirrel	G (ZLA ARTCC regulated once at the floor of overlying Class E airspace)	V208, V210, V257, V291	IR112	Sunny (ZAB ARTCC)	within SFAR 50-2	2, 3, 4, 5, 6, 7
St. Johns Industrial Airport	E (ZAB ARTCC)	V190, V264, V528	VR176, IR112, IR320	Jackal, Reserve, Cato, Smitty		1,2,3,4,5,6,7, 8
Winslow-Lindbergh RAP	E (ZAB ARTCC) (see NOTAMs/ Supplement for Class E effective hours)	V95, V12 264, V291, , V567, V572	IR112	Sunny		1, 2, 3, 4, 5, 6, 7, 8

Sources: VFRmap 2016; FPAP 2007; GCAP 2005; HACMAF 2007; KAP 2006; SMA 2007; WLRAP 1998

Note:

¹ Airspace Class G is only existing until the floor of overlying Class E airspace. Overlying airspace is Class E if not otherwise designated as A, B, C, or D. Class G was listed as the airspace class for a location if no symbol representing the floor of the overlying Class E airspace is present on the FAA VFR map (i.e., VFRmap 2016) or if the area is not within a MOA or RA; therefore, the floor of the overlying Class E airspace in these locations is assumed to be 14,500 feet MSL. .

Key: NF= National Forest; TA = Terminal Area; AP = Airport; Co. = County; NP = National Park; RAP = Regional Airport

Training Activity Key:

- | | |
|---|--|
| 1. Fixed-Wing Terminal Area Operations | 6. Command, Control, Communications, Computers, and Intelligence Operations Location |
| 2. Rotary-Wing Terminal Area Operations | 7. Logistical / Beddown location |
| 3. Parachute Operations | 8. Forward Aircraft Refueling Point |
| 4. Dismounted Ground / Water Operations | |
| 5. Dismounted Ground / Water Movement | |

Table G-3 outlines airspace characteristics of the proposed AT training exercise locations in New Mexico that are displayed on FAA VFR Sectional maps.

Table G-3. Airspace Characteristics of Proposed AT Training Exercise Locations in New Mexico

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
Military Installations						
Melrose Air Force Range	ZAB ARTCC regulated when R-5104A is inactive	V62, V264	VR100, IR107, VR108, IR109, IR111, IR113, VR114, VR125, VR1107, VR1195	Pecos North High and Taiban, Pecos North High and Low, Pecos South	• within R-5104A • near R-5105	1, 2, 3, 4, 5, 6, 7
White Sands Missile Range	ZAB ARTCC regulated when R-5107B is inactive		VR176	Beak A, Beak B, Beak C	• within R-5107B (which includes R-5107D, R-5107F, and R-1507G) • near R-5107A, R-5107 C&H, R-5-107 C&J, R-5107D, R-5107E, R-5107K, R-5111 A & B, R-5111 C & D	1, 2, 3, 4, 5, 6, 7
U.S. Forest Service						
Glenwood Ranger Station (Gila NF)	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 3, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
U.S. Forest Service (continued)						
Negrito Airstrip	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		1, 2, 3, 4, 5, 6, 7
Negrito Center	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 3, 4, 5, 6, 7
Negrito Helibase	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 4, 5, 6, 7
Negrito North	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 3, 4, 5, 6, 7
Negrito South	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 3, 4, 5, 6, 7
Rainy Mesa	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 3, 4, 5

Training Exercise Expansion Location	Airspace Class ¹	Victor Airways in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs in Vicinity of Airspace	Restricted Airspace	Training Activities (Key below)
U.S. Forest Service (continued)						
Reserve Ranger Station	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 4, 5, 6, 7
Catron County Fairgrounds	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		2, 4, 5, 6, 7
Reserve Airport	ZAB ARTCC regulated when Reserve MOA is inactive		VR176	• within Reserve • near Morenci, Cato, Smitty, Jackal		1, 2, 3, 4, 5, 6, 7
Miscellaneous						
Playas Training and Research Center	G (ZAB ARTCC regulated once at the floor of overlying Class E airspace)	V16, V66, V198, T306	VR263	Tombstone A & C, Tombstone B & C, Tombstone C,	R-5115	1, 2, 3, 4, 5, 6, 7

Source: VFR 2016

Note:

¹ Airspace Class G is only existing until the floor of overlying Class E airspace. Overlying airspace is Class E if not otherwise designated as A, B, C, or D. Class G was listed as the airspace class for a location if no symbol representing the floor of the overlying Class E airspace is present on the FAA VFR map (i.e., VFRmap 2016) or if the area is not within a MOA or RA; therefore, the floor of the overlying Class E airspace in these locations is assumed to be 14,500 feet MSL.

Key: NA = National Forest

Training Activity Key:

- | | |
|---|--|
| 1. Fixed-Wing Terminal Area Operations | 6. Command, Control, Communications, Computers, and Intelligence Operations Location |
| 2. Rotary-Wing Terminal Area Operations | 7. Logistical / Beddown location |
| 3. Parachute Operations | 8. Forward Aircraft Refueling Point |
| 4. Dismounted Ground / Water Operations | |
| 5. Dismounted Ground / Water Movement | |

Table G-4 outlines airspace characteristics of the proposed AT training exercise locations in California that are displayed on FAA VFR Sectional maps.

Table G-4. Airspace Characteristics of Proposed AT Training Exercise Locations in California

Training Exercise Expansion Location	Airspace Class ¹	Victor Routes in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs Vicinity of Airspace	Restricted and/or Warning Areas Vicinity of Airspace	Training Activity (Key below)
Military Installations						
Camp Pendleton Cartwright Water	E within Mode C Required Airspace	V363, V27, V25, V23, V363, V 597			• R-2503 B & C2, R-2503A & D2, W-291	2, 3, 4, 5
Camp Pendleton HOLF	G (when RA isn't active)	V23-165-597, V186, V363, V25, V27, V208-458			• within R-2503A & D2 • near R-2503 B & C2	2, 3, 4, 5, 6, 7
Camp Pendleton NFG	E (when RA isn't active) within Mode C Required Airspace	V23-165-597, V186, V363, V25, V27, V208-458			• within R-2503A & D2 • near R-2503 B & C2	2, 3, 4, 5, 6, 7
Camp Pendleton Off-Road Trail	G (when RA isn't active)	V23-165-597, V186, V363, V25, V27, V208-458			• within R-2503 B & C2 • near R-2503A & D2	2, 4, 5
Camp Pendleton PDL	G (when RA isn't active)	V23-165-597, V186, V363, V25, V27, V208-458			• within R-2503 B & C2 • near R-2503A & D2	2, 3, 4, 5, 6, 7
Camp Pendleton Red Beach	E (when RA isn't active) within Mode C Required Airspace	V23-165-597, V186, V363, V25, V27, V208-458			• within R-2503A & D2 • near R-2503 B & C2	2, 3, 4, 5, 6, 7
El Centro	E	V137, V317, V 66- 458,	VR 1266, IR 217	Kane West, Kane South, Abel Bravo, Abel East, and Abel South	• R-2512, R-2510 A, R-2510 A & B, R-2507S, and R-2507E	1, 2, 3, 4, 5, 6, 7, 8

Training Exercise Expansion Location	Airspace Class ¹	Victor Routes in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs Vicinity of Airspace	Restricted and/or Warning Areas Vicinity of Airspace	Training Activity (Key below)
Military Installations (continued)						
Knots Circular Water	D & E (see NOTAMs/Supplement for Class D/E effective hours (when W-291 is inactive))	V27, V208-458			• within W-291 • near W-292E, W-292W, CA- 1156L, CA-1177L	2, 3, 4, 5
Leon	E	V23-363-597, V25, V27, V165, V317, V460-514			W-291, CA- 1156L	2, 3, 4, 5
March ARB	C	V197, V283-372, V64, V372, V388, V283-587, V442, V8-21				1, 2, 4, 5, 6, 7, 8
NAS North Island NZY	B within Mode C Required Airspace	V460-514, V317, V165				1, 2, 4, 5, 6, 7
Nautica Circular Water	D & E (see NOTAMs/Supplement for Class D/E effective hours (when W-291 is inactive))	V27, V208-458			• within W-291 • near W-292E, W-292W, CA- 1156L, CA-1177L	2, 3, 4, 5
San Clemente Island Naval Auxiliary Landing Field	D & E (see NOTAMs/Supplement for Class D/E effective hours (when W-291 is inactive))	V27, V208-458			• within W-2912 • near W-292E, W-292W, CA- 1156L, CA-1177L	1, 2, 4, 5, 6, 7
San Clemente Island West	ZLA ARTCC regulated when W-291 is inactive	V27, V208-458			• within W-2912 • near W-292E, W-292W, CA-1156L, CA-1177L	1, 2, 4, 5, 6, 7

Training Exercise Expansion Location	Airspace Class ¹	Victor Routes in Vicinity of Airspace	MTRs in Vicinity of Airspace	MOAs Vicinity of Airspace	Restricted and/or Warning Areas Vicinity of Airspace	Training Activity (Key below)
Military Installations (continued)						
San Nicolas Island	D/E (see NOTAMS for Class D/E effective hours) (when RAs are inactive)				- within R-2535B, W-289S, & CA-Pacific Low - near R-2535A, W-289W, W-291, W-292E, W-292W, CA-1318L, CA-1156L, CA- 1177L	1, 2, 4, 5, 6, 7

Source: VFR 2016

Notes:

¹ Airspace Class G is only existing until 700 feet AGL, overlying airspace is Class E if not designated as A, B, C, or D.

² Restricted Airspace for ISR use to include unmanned aircraft

Key: ARB = Air Reserve Base; NAS = Naval Air Station; NZY = NAS North Island airport code

Training Activity Key:

- | | |
|---|--|
| 1. Fixed-Wing Terminal Area Operations | 6. Command, Control, Communications, Computers, and Intelligence Operations Location |
| 2. Rotary-Wing Terminal Area Operations | 7. Logistical / Beddown location |
| 3. Parachute Operations | 8. Forward Aircraft Refueling Point |
| 4. Dismounted Ground / Water Operations | |
| 5. Dismounted Ground / Water Movement | |



H

Cultural Resources Records
Search Results

Appendix H: Cultural Resources Records Search Results

Table H-1. Proposed Training Sites with No Cultural Resources Impacts

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Military Installations					
Aux 6	DZ/HLZ/LZ/FARP	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Aux 6 Circular	DZ/HLZ/LZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Aux 6 Rectangular	DZ/HLZ/LZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
DM AFB	DZ/HLZ/LZ/FARP	DM AFB	Unknown	None (Davis-Monthan AFB 2002)	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.
DM AFB CATM	Firing Range	DM AFB	Unknown	None (Davis-Monthan AFB 2002)	Existing facility; currently approved for use for similar training activities.
Florence	DZ/HLZ/ MOUT	Florence Military Reservation	Kirvan and Rogge 2009	None	Existing facility; currently approved for use for similar training activities.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Military Installations (continued)					
Gila Bend Air Force Auxiliary Base	DZ/HLZ/LZ/FARP	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Hubbard	FARP	Fort Huachuca	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources. Previously surveyed. Activities would not affect historic properties. (Pers. Comm. Martyn Tagg, July 16, 2015).
Hubbard (Tombstone)	LZ/HLZ/Austere DZ/LZ/HLZ	Fort Huachuca	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources. Previously surveyed. Activities would not affect historic properties (Pers. Comm. Martyn Tagg, July 16, 2015).
Humor	DZ/HLZ	Fort Huachuca	Unknown	Unknown	Currently approved for use for similar training activities. Previously surveyed. Activities would not affect historic properties (Pers. Comm. Martyn Tagg, July 16, 2015).
Libby Army Airfield	DZ/HLZ/LZ/FARP	Fort Huachuca	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources. Previously surveyed. Activities would not affect historic properties (Pers. Comm. Martyn Tagg, July 16, 2015).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Military Installations (continued)					
NATO Hill (WPT 74)	HLZ	Luke AFB	Heilen and Vanderpot 2013	Two prehistoric archaeological sites.	Existing facility; currently approved for use for similar training activities. Two prehistoric archaeological sites are at the base of the hill; training activities would be limited to the top of the hill and would not affect the sites (Pers. Comm. Adrienne Rankin, April 4, 2017).
OP Charlie	HLZ/Close Air Support	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 1	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 2	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 3	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 4	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 5	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Range 3 – HLZ 6	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Military Installations (continued)					
Range 3 – Tower Helipad	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
South Tactical Range	HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Existing facility; currently used for training. Activities would not affect historic properties (Pers. Comm. Adrienne Rankin, January 5, 2017).
Target 333	DZ/HLZ	Luke AFB	Heilen and Vanderpot 2013	Unknown	Currently approved for use for similar training activities.
Tombstone Circular	DZ	Fort Huachuca	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur in the disturbed area at the airfield and would not have potential to affect cultural resources. Previously surveyed. (Pers. Comm. Martyn Tagg, July 16, 2015)
Tombstone Rectangular	DZ	Fort Huachuca	Unknown	Unknown	Existing airfield; currently used for training. Previously surveyed. Activities would not affect historic properties (Pers. Comm. Martyn Tagg, July 16, 2015)
Southern Arizona – Miscellaneous					
Bisbee Douglas IAP	DZ/HLZ/LZ/FARP	Cochise County	None	Bisbee Douglas IAP	Existing airfield. Activities would occur on airport pavements and would not affect cultural resources.
Coolidge Airport	DZ/HLZ/LZ/FARP	City of Coolidge	1973-13.ASM; 1979-124.ASM; 1982-78.ASM; 1986-70.ASM; 2008-441.ASM; Unknown ^d	Coolidge Airport	Existing airfield. Activities would occur on airport pavements and would not affect cultural resources.
Eloy North	DZ/HLZ	Skydive Arizona	2003-1076	AZ AA:12:875 (ASM)	Heavily disturbed field used for Skydive Arizona's skydive operations. Activities would not cause new disturbance.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Miscellaneous (continued)					
Little Outfit	DZ/HLZ	Pete Robbins	None	Unknown	Existing airstrip. Training activities would be contained within existing disturbance area.
Phoenix Sky Harbor IAP	LZ	City of Phoenix	7.2814. SHPO; 2003-771.ASM; 2005-895.ASM; 2004-1888.ASM; 7.3187. SHPO; 1999-587.ASM; 2004-815.ASM; 2004-1780.ASM; 2005-86.ASM; 2003-675.ASM; 2006-765.ASM; 2011-19.ASM; 2012-9.ASM; 1999-582.ASM; 2012-159.ASM; 2008-36.ASM; 2009-652.ASM; 2013-365.ASM	AZ T:12:131 (ASM); P:3:6 (GP); AZ T:12:62 (ASM); AZ T:12:47 (ASM); AZ U:9:237 (ASM); AZ U:9:297 (ASM); AZ T:10:84 (ASM); Phoenix Sky Harbor IAP	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Pima County Emergency Operations Center	Operations Center	Pima County Sheriff	11-42-5E.BLM; 2008-53.ASM; 1999-147.ASM; 1998-141.ASM	None	Use of an existing building as an operations center would not have potential to affect cultural resources.
Pima County Regional Training Center	Classroom/MOUT	Pima County Sheriff	None	Unknown	Use of an existing building for classroom and MOUT training would not have potential to affect cultural resources.
Scottsdale Osborne	HLZ	Scottsdale Healthcare	2001-284.ASM	None	Existing helipad at the medical center. Use of the helipad would not have potential to affect cultural resources.
Three Points Public Shooting Range	Shooting Range	Tucson Rifle Club, Inc.	1973-10.ASM; 1995-339.ASM	AZ AA:16:377 (ASM); AZ Z:14:127 (ASM)	Use of an existing shooting range for training would not have potential to affect cultural resources.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – Miscellaneous (continued)					
University of Arizona Medical Center	HLZ	University of Arizona Medical Center	1998-59.ASM	Unknown	Use of an existing helipad at the medical center would not have potential to affect cultural resources.
Salt River High	HLZ	White Mountain Apache	None	Unknown	The HLZ is within a heavily disturbed quarry. The White Mountain Apache THPO had no cultural resource concerns related to the use of this site and concurred with the finding of no effect on historic properties.
Salt River Low	HLZ/Water Area	White Mountain Apache	None	Unknown	The White Mountain Apache THPO had no cultural resource concerns related to the use of this site and concurred with the finding of no effect on historic properties.
Saguaro Lake Ranch	Water Area	Arizona Dept. of Public Safety (DPS)	1972-2.ASM; 7.2045.SHPO; 7.151.SHPO; 1963-5.ASM	AZ U:6:194 (ASM); AZ U:6:195 (ASM)	Activities would occur within the water. No disturbance would occur along the shorelines except at dedicated boat launch facilities.
Verde River	Water Area	Arizona DPS	1972-2.ASM; 7.151.SHPO; 1963-5.ASM	None	Activities would occur within the water. No disturbance would occur along the shorelines except at dedicated boat launch facilities.
Northern Arizona – Military Installations					
Camp Navajo Army Base	MOUT	Camp Navajo	Unknown	Unknown	Developed area; currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Fort Tuthill	Operation Center/ Billeting	Fort Tuthill	Unknown	Unknown	Developed area; currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – Military Installations (continued)					
L Tank	DZ/HLZ/ MOUT	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Metz Tank	DZ/HLZ	Camp Navajo	Unknown	Unknown	Disturbed area; currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Navajo East	DZ/HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Navajo Railroad	DZ/HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Navajo West	DZ/HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Neill Flat	DZ/HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Rogers Lake (Logger Camp)	DZ/HLZ/ MOUT	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Rodgers Napier	HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – Military Installations (continued)					
Rodgers Wren	HLZ	Camp Navajo	Unknown	Unknown	Currently approved for use for similar training activities. Training would not affect historic properties. (Pers. Comm. Hannah Telle, February 17, 2015).
Northern Arizona – USFS					
Pittman Valley	DZ/HLZ	Kaibab NF	None	Unknown	Existing helibase with large paved area containing two helipads. Activities would be contained within the paved helipad area.
Roosevelt Lake	Water DZ/Water HLZ	Tonto NF	None	Unknown	Activities would occur within the water. No disturbance would occur along the shorelines except at dedicated boat launch facilities.
Northern Arizona – Miscellaneous					
Caldwell Meadows	DZ/HLZ	Arizona Game and Fish Department	2004-366.ASM	None	The location was completely surveyed in 2004. No sites were identified in the APE.
Colorado River	Water Area	Arizona DPS	None	Unknown	Activities would occur within the water. No disturbance would occur along the shorelines except at dedicated boat launch facilities.
Flagstaff Pulliam Airport	HLZ/LZ	City of Flagstaff	1975-13.ASM	NA14166; Flagstaff Pulliam Airport	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
FR 320/311	DZ/HLZ/LZ	Private	Unidentified Survey	Unknown	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Gila County Sheriff Roosevelt Substation	HLZ	Gila County Sheriff	None	Unknown	Existing parking area with paved/ disturbed surfaces. Activities would occur within paved and disturbed areas and would not have potential to affect cultural resources.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – Miscellaneous (continued)					
Grand Canyon National Park Airport	LZ	State of Arizona	1990-176.ASM; 2000-114.ASM; 1999-27.ASM; 1989-210.ASM	Grand Canyon National Park Airport	Existing airfield. Activities would occur on airport pavements and would not affect cultural resources.
Grand Canyon Valle Airport	DZ/HLZ/LZ	Grand Canyon Valley Corp	1991-227.ASM; 1991-268.ASM; 1196-336.ASM	Grand Canyon Valle Airport	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
H. A. Clark Memorial Field	DZ/HLZ/LZ	City of Williams	None	H.A. Clark Memorial Field	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
HLZ 6	HLZ	Private	None	Unknown	Existing sports field with disturbed surface. Activities would occur within the sports field and would not have potential to affect cultural resources.
Kingman Airport	DZ/HLZ/LZ	City of Kingman	None	AZ G:9:8 (ASM)	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Sinkhole	HLZ	Private	1995-282.ASM; 1996-458.ASM	AZ G:9:8 (ASM)	Existing airfield. Activities would occur at the airfield disturbance area and would not have potential to affect cultural resources.
Springerville Airport	DZ/HLZ/LZ	City of Springerville	1948-1.ASM; 75-011.ASU	Springerville Airport	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Sprucedale Guest Ranch	Billeting/ Operation Center	Whitney Wiltbank	None	Unknown	Use of the existing Guest Ranch for billeting and an operations center would not have potential to affect cultural resources.
St. Johns Industrial Air Park	DZ/HLZ/LZ/FARP	City of St. Johns	Unidentified Survey	Unknown	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Winslow-Lindbergh Regional Airport	DZ/HLZ/LZ/FARP/ Austere Logistics Base/ Operation Center	City of Winslow	2010-530.ASM	Winslow-Lindbergh Regional Airport	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
New Mexico – Military Installations					
Melrose Air Force Range	DZ/HLZ/MOUT/ Shooting Range	USAF	Unknown	Unknown	Currently approved for use for similar training activities.
White Sands Missile Range	DZ/HLZ/ MOUT/ Shooting Range	Army	Unknown	Unknown	Currently approved for use for similar training activities.
New Mexico – USFS					
Catron County Fairgrounds	HLZ	USFS	29705; 119254	None	Previously surveyed in 2010. No known sites. Fairgrounds are previously disturbed.
Glenwood Ranger Station	DZ/HLZ	Gila NF	22456; 29731; 43872; 112154	Unrecorded administrative building/sites	Previously surveyed, with the most recent survey in 2008. The area is currently used for helicopter operations. USFS indicated use for the Angel Thunder training would not affect the nearby administrative buildings and sites.
Negrito Airstrip	DZ/HLZ/LZ	Gila NF	21941	None	Existing airfield. Activities would occur within the airport disturbance area and would not have potential to affect cultural resources. Consultation with USFS indicates training would not have potential to affect historic properties due to previous disturbance.
Negrito Center	DZ/HLZ	Gila NF	None	Unknown	Existing airfield. Activities would occur within the airport disturbance area and would not have potential to affect cultural resources. Consultation with USFS indicates training would not have potential to affect historic properties due to previous disturbance.
Negrito Helibase	HLZ	Gila NF	95797; 63903; 116270	None	Area completely surveyed; however, some surveys are of questionable intensity and one survey within the last ten years does not cover the entire APE. Consultation with USFS indicates they could approve training at this existing helibase on account of the extent of previous survey, lack of sites, and previous disturbance.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
New Mexico – USFS (continued)					
Rainy Mesa	HLZ	Gila NF	21941	None	Consultation with the USFS indicates this previous survey was intensive, no known sites are present, and training activities would not affect historic properties.
Reserve Airport	DZ/HLZ/LZ	USFS	16530; 21934; 82576; 91183; 94677	33974 (6-370); 39977 (6-374); 69064 (6-880); 70194 (3-375); 149438 (6-1287); Reserve Airport	Existing airfield. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Reserve Ranger Station	DZ/HLZ	Gila NF	21934; 22456; 23972; 58282; 92472; 104118	33624 (06-869)	Area completely surveyed. Some surveys are of questionable intensity and one survey within the last ten years does not cover the entire APE. Site 33624 (06-869) encompasses most of the APE and is not eligible. Other eligible sites are nearby but outside the APE. The training site is within an animal paddock that is occasionally used by the Gila NF for helicopter operations. Consultation with the USFS indicates they could approve use of this site conditioned upon avoidance of historic properties.
New Mexico – Miscellaneous					
Playas Training and Research Center	DZ/HLZ/LZ/MOUT/ Driving/ Billeting	New Mexico Institute of Mining and Technology	None	Unknown	The PTRC was previously analyzed for cultural resource impacts and approved for uses equivalent to the Angel Thunder training activities that would occur here (New Mexico Tech 2006).
California – Military Installations					
Camp Pendleton Cartwright Water	DZ/HLZ/ Water Area	Camp Pendleton	Unknown	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
California – Military Installations (continued)					
Camp Pendleton HOLF	DZ/HLZ/ MOUT	Camp Pendleton	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
California – Military Installations					
Camp Pendleton NFG	DZ/HLZ/LZ	Camp Pendleton	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
Camp Pendleton Off-Road Trail	Off-Road	Camp Pendleton	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
Camp Pendleton PDL	DZ/HLZ/ MOUT	Camp Pendleton	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
Camp Pendleton Red Beach	DZ/HLZ/ Austere HLZ/Water	Camp Pendleton	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
El Centro	DZ/HLZ/LZ/FARP	Naval Air Facility El Centro	Unknown	Unknown	Existing facility; currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
Knots Circular Water	DZ/HLZ Water	NAS North Island	Unknown	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).
Leon	DZ/HLZ	NAS North Island	Unknown	Unknown	Currently approved for use for similar training activities. Activities would not affect historic properties (Pers. Comm. Joe Vaineharrison, May 1, 2015).

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
California – Military Installations (continued)					
March ARB	HLZ/LZ/ FARP	March ARB	JRP Historical Consulting 2011	None	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.
NAS North Island NZY	HLZ/LZ/ FARP	NAS North Island	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.
Nautica Circular Water	DZ/HLZ Water	NAS North Island	Unknown	Unknown	Currently approved for use for similar training activities.
San Clemente Island Naval Auxiliary Landing Field	HLZ/LZ/ FARP	NAS North Island	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.
San Clemente Island West	DZ/HLZ	NAS North Island	Unknown	Unknown	Currently approved for use for similar training activities.
San Nicolas Island	HLZ/LZ	NAS North Island	Unknown	Unknown	Existing airfield; currently approved for use for similar training activities. Activities would occur on airport pavements and would not have potential to affect cultural resources.

Table H-2. Proposed Training Sites Requiring Additional Cultural Resource Review

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Southern Arizona – USFS					
Canelo	DZ/HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Devon	HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Mesa	HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Mount Lemon	Technical Rope Work	Coronado NF	None	Unknown	Natural surface/cliffs. No prior survey. Additional survey and Section 106 consultation required.
Ranger	DZ/HLZ	Coronado NF	None	Unknown	Existing helipads with disturbed soils. No prior survey. Additional survey and Section 106 consultation required.
Saddle Mountain East	DZ/HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Saddle Mountain South	DZ/HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Saddle Mountain West	DZ/HLZ	Coronado NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Southern Arizona – Miscellaneous					
Eloy South	DZ/HLZ	Skydive Arizona	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Highway 80 Paladins	DZ/HLZ		None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Ruby Fuzzy Paladins	DZ/HLZ/ Observation Point	State of Arizona	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Tombstone Paladins	DZ/HLZ	State of Arizona	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Northern Arizona – USFS					
Black Mesa - USFS Helitack Base	DZ/HLZ	Apache-Sitgreaves NF	None	Possible historic buildings	Existing helibase. No previous survey. Possible historic buildings present. Additional survey and Section 106 consultation required.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – USFS (continued)					
Comanche	DZ	Coconino NF	1988-238.ASM	36066	Natural surface. APE partially surveyed. Survey is more than 10 years old and may not meet current standards. A historic railroad is present that is unevaluated for NRHP listing. Additional survey and Section 106 consultation required.
Elk	DZ	Coconino NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Flagstaff Hotshot – USFS Helitack Base	DZ/HLZ	Coconino NF	None	Unknown	Existing helibase. No previous survey. Additional survey and Section 106 consultation required.
Hannagan Meadow – USFS Helitack Base	DZ/HLZ	Apache-Sitgreaves NF	None	Unidentified Site ^a	Existing helibase. No previous survey. One unidentified site is present within the APE with unknown NRHP eligibility. Additional survey and Section 106 consultation required.
Helibase Circular	DZ/HLZ	Apache-Sitgreaves NF	None	Unidentified Site ^a	Existing helibase. No previous survey. One unidentified site is present within the APE with unknown NRHP eligibility. Additional survey and Section 106 consultation required.
Jacks Canyon	HLZ	Coconino NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
KP Circular	DZ/HLZ	Apache-Sitgreaves NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
KP Tank	DZ/HLZ	Apache-Sitgreaves NF	None	Unknown	Natural surface near tank. No prior survey. Additional survey and Section 106 consultation required.
Longview – USFS Helitack Base	DZ/HLZ	Coconino NF	None	NA20311	Existing helibase. No prior survey. Historic cabins are present that are unevaluated for NRHP listing. Additional survey and Section 106 consultation required.
Mogollon Rim (General Crook)	HLZ/ Technical Rope Work	Apache-Sitgreaves NF	Unidentified Survey ^a	None	Natural surface near stock pond. APE partially surveyed; no information was found regarding the survey's age or intensity. Additional survey and Section 106 consultation required.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – USFS (continued)					
Mohawk	DZ	Kaibab NF	8355.SHPO; Unidentified Survey ^a	AR-03-07-04-00461	Natural surface. APE partially surveyed. No information was found regarding the age or intensity of the surveys. One known prehistoric site is present that is unevaluated for NRHP listing. Additional survey and Section 106 consultation required.
Mormon Lake – USFS Helitack Base	DZ/HLZ	Coconino NF	None	Possible historic buildings	Existing helibase. Possible historic buildings are present. No previous survey. Additional survey and Section 106 consultation required.
Overgaard – USFS Helitack Base	DZ/HLZ	Apache-Sitgreaves NF	None	Unknown	Existing helibase. No previous survey. Additional survey and Section 106 consultation required.
Payson-RimSide	DZ	Tonto NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Rough Rider	HLZ	Coconino NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Tribeland	DZ	Kaibab NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Northern Arizona – Miscellaneous					
Babbitt Ranch 1	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Babbitt Ranch 2	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Babbitt Ranch 3	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Bone Crusher	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Cattle	HLZ/DZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Cattle LTFW	HLZ/LZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Gerbil	HLZ/DZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.

Name	Type	Controlling Agency	Previous Surveys	Identified Cultural Resources	Notes
Northern Arizona – Miscellaneous (continued)					
HLZ 5	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
HLZ 7	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
HLZ 8	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Lee's Ferry	DZ/HLZ/LZ	National Park Service	None	Unknown	Most of the APE is an existing parking area with paved/disturbed surfaces. The APE has had no prior survey. Survey is needed of undisturbed areas and additional Section 106 consultation is required.
Panda	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Powerline	HLZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Sage	HLZ/DZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
Squirrel	HLZ/DZ	Private	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.
New Mexico – USFS					
Negrito North	DZ/HLZ	Gila NF	LTC Survey 1979-25; LTC Survey 1988-27	None	Natural surface. The APE has been partially surveyed; the surveys are more than 10 years old and may not meet current standards. Additional survey and Section 106 consultation required.
Negrito South	DZ/HLZ	Gila NF	None	Unknown	Natural surface. No prior survey. Additional survey and Section 106 consultation required.

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