

FINDING OF NO SIGNIFICANT IMPACT

For Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field and Barry M. Goldwater Range East

1. Description of the Proposed Action and Alternatives

In response to a new emphasis on training in increasingly relevant expeditionary combat skills, Luke AFB proposes to implement two recurring expeditionary training programs at Gila Bend Air Force Auxiliary Field (AFAF) and to develop training capabilities to support these programs. Gila Bend AFAF is proposed as the site for these training programs because it will provide an environment that realistically simulates the conditions that may be encountered at a primitive, forward air base. The proposal also involves training within the eastern portion of the Barry M. Goldwater Range (referred to as BMGR East).

The training programs are designed to provide military personnel who may be deployed to active duty combat forward air base environments with the up-to-date knowledge, skills, and war-fighting mentality that are needed to survive and operate effectively in a high threat environment where there are no completely secure rear areas of operation. The two pre-deployment training programs include Air Expeditionary Force (AEF) flight training for aircrews, aircraft maintenance personnel, and air operations planning personnel, and Expeditionary Thunderbolt Training (ETT) for other personnel involved in ground-based exercises. With AEF training, aircraft operations will originate at Gila Bend AFAF and transit to BMGR East ranges to conduct air combat training sorties. ETT deployment will be limited principally to Gila Bend AFAF but will use certain existing BMGR East roads for vehicle convoy training and may involve the use of the existing BMGR East small arms range for weapons familiarization training.

Air Expeditionary Force Training

The proposed recurring AEF training deployments to Gila Bend AFAF will occur up to 20 times per year to give aircrew and aircraft maintainers the opportunity to deploy, plan, and execute live-fire, air combat flight operations from an unfamiliar, forward location. Ten of the 20 annual AEF training deployments will be from the 56th Fighter Wing (FW) and 944 FW at Luke AFB and involve F-16 aircraft, pilots, and aircraft maintenance and air operations planning personnel. An estimated 10 additional annual deployments likely will be generated either from various other air installations in southern Arizona or from units that seasonally deploy to these installations for readiness training. The other air installations include the 355 Wing at Davis-Monthan AFB, Tucson; 162 FW at the Arizona Air National Guard Station, Tucson International Airport; and Western Army National Guard Aviation Training Site (WAATS), Silverbell Army Heliport at Marana.

Each AEF training deployment will last one week and typically will involve 10 to 12 aircraft and approximately 120 persons. Although atypical, during training surges, AEF

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14. ABSTRACT

In response to a new emphasis on training in increasingly relevant expeditionary combat skills, the Air Force proposes to (1) implement two recurring, pre-deployment expeditionary training programs at Gila Bend AFAF Air Expeditionary Force (AEF) training and Expeditionary Thunderbolt Training (ETT) and (2) develop training capabilities at Gila Bend AFAF to support these programs. The 56th Fighter Wing currently conducts these programs at Luke AFB with flight operations at BMGR East, but the Air Force proposes to relocate the training to the more austere environment available at the Gila Bend AFAF to simulate the conditions at a remote, deployed location and to train in an environment similar to that which may be encountered in combat deployments. It is anticipated that other BMGR users, such as Davis-Monthan AFB and the Army National Guard, would use the training facilities if they were established at the Gila Bend AFAF. The AEF training deployments would last one week, occur up to 20 times per year, involve 10-12 aircraft and up to 120 people, and would relocate approximately 3,120 to 3,600 take-off and landing operations to the Gila Bend AFAF from the installations from which they currently originate. ETT deployments would typically last three days (but could be up to five days), occur up to 50 times per year, involve approximately 30 to 50 people and principally be limited to training at Gila Bend AFAF (but certain existing BMGR East roads would be used for vehicle convoy training). Two new expeditionary training areas are proposed at previously disturbed sites at Gila Bend AFAF: an operations area near the flight line and an expeditionary billeting area at a site formerly used for family housing. Aluminum framed tents and associated infrastructure would be erected at these sites and some existing support facilities and services would be used in support of the proposed training. The no-action alternative is to continue to conduct expeditionary training in the manner that it currently occurs today, at installations that less accurately represent expected combat deployment conditions. The potential environmental effects of these alternatives are discussed in regard to airspace and range operations, land use, ground transportation and utilities, noise, public and occupational health and safety cultural resources, socioeconomic resources, hazardous materials and waste, earth resources, water resources air quality, biological resources, and environmental justice. No significant impacts were identified during the impact assessment.

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deployments may involve up to 18 aircraft and personnel requirements may increase to approximately 250 persons. Training deployments from Luke AFB and 162 FW will involve F-16 aircraft. Deployments from the 355 Wing will involve A-10, OA-10, C-130, and/or HH-60 aircraft. Deployments from the WAATS will involve AH-1, AH-64, and/or UH-60 aircraft.

Some existing support facilities and services current available at Gila Bend AFAF will be used in AEF training. This will include the runway, taxiway, and aircraft parking apron at the airfield; an aircraft maintenance shelter adjacent to the apron; the dining hall; fire, emergency response, and security services at the airfield; the existing billeting facility for training instructors; storage for petroleum, oil, and lubricants (POL); and the munitions storage area. Munitions needed for AEF training will be delivered to Gila Bend AFAF through ongoing requisitioning procedures and in accordance with applicable safety standards. Inert training ordnance (such as Bomb Dummy Unit-33s and 20mm cannon practice ammunition) will be the principal ordnance uploaded onto aircraft at Gila Bend AFAF for AEF training. All ordnance delivery missions flown on BMGR East for AEF training will be performed in accordance with currently approved procedures established by the 56 FW and Air Force, and also in accordance with currently applicable Biological Opinions rendered under the Endangered Species Act.

Two new training areas will be established at Gila Bend AFAF to support AEF training. An expeditionary operations area will be developed near the existing base operations building and aircraft parking ramp and an expeditionary billeting area will be developed in or near the former family housing area at Gila Bend AFAF. AEF operations planning and logistics personnel will conduct their activities in the expeditionary operations area. Some aircraft maintenance activities also will be performed at this location. Personnel receiving AEF training will be housed in the proposed billeting area. The expeditionary operations training area will be established in one or both of two previously disturbed but now vacant lots that are near the aircraft parking ramp. The billeting area will be established at one or more of three previously disturbed but now vacant lots located near the western perimeter of the Gila Bend AFAF cantonment area.

Infrastructure requirements at the expeditionary operations area will include the installation of up to five units of the Alaska Small Shelter System (AKSSS), a portable, lightweight, fabric coated shelter system that has an aluminum frame erected over a poured concrete floor. Two of the AKSSSs will be used for command, operations, and logistics functions, two other shelters will house maintenance activities, and a possible fifth AKSSS will be used as a medical facility. Each AKSSS will be serviced with electrical power and a heating, ventilation, and air conditioning system located outside of each shelter. Electrical power is available to both of the lots that are proposed as sites for the expeditionary operations area. Sanitary human waste disposal will be accomplished either by connecting a standard portable latrine trailer to the existing waste water treatment system at Gila Bend AFAF or by providing portable toilets through an approved licensed contractor.

Infrastructure requirements at the proposed expeditionary billeting area will include the installation of 24 AKSSSs configured into a tent city covering approximately 1.5 acres and able to accommodate up to 288 persons. Existing electrical power infrastructure is available in the area proposed for the tent city. In addition to the AKSSSs, two prefabricated shower and latrine trailers will be installed in the billeting area and could be connected to the existing waste water treatment system at Gila Bend AFAF. The billeting area layout at Gila Bend AFAF will include security setbacks to provide its occupants and security force with firsthand training experience with force protection issues that will directly affect their safety in deployed areas of operations. A collapsible fuel bladder, with appropriate level surfacing and protective berms and linings may be used to provide supplementary fuel storage. If used, the fuel bladder would pragmatically be sited next to the existing fuel park or ramp; however, it could be placed anywhere accessible to a large (R-11) fuel truck.

Ground personnel associated with AEF training will be transported to Gila Bend AFAF from Luke AFB by bus and will remain at the airfield for the duration of the AEF training course. Supplies and equipment needed for AEF training will be transported from Luke AFB by tractor trailer prior to the course in which they will be needed.

AEF training at Gila Bend AFAF will involve aircraft flying operations at BMGR East on five days during each of the week-long AEF courses. Aircraft and aircrew will deploy from their home base on the first day of the course, conduct their training mission at BMGR East, and land at Gila Bend AFAF. During the next three days, flying training typically will involve approximately 22 to 26 sorties of 1.5 hours duration each (each sortie accounts for two operations – taking off and landing – at the airfield). On the final day of the course, aircraft will take off from Gila Bend AFAF and conduct a training mission at BMGR East before returning to their home base. . Each take-off and landing is counted as a flying operation, so each AEF course will result in approximately 156 to 180 operations at Gila Bend AFAF. If 20 AEF courses occur annually, this will result in an increase of approximately 3,120 to 3,600 annual flying operations at Gila Bend AFAF, but will not represent a change in flying activity at BMGR East as these training sorties are currently being generated out of Luke AFB, Davis-Monthan AFB, or WAATS. The numbers and types of munitions delivery activities at BMGR East associated with AEF training also will not be affected by the deployment to Gila Bend AFAF.

Expeditionary Thunderbolt Training

The proposed ETT deployments to Gila Bend AFAF would occur up to 50 times per year. Each deployment typically will last three days (but this could be expanded to four or five days to provide additional time for travel and setup) and will involve 30 to 50 persons, although some individual ETT courses would potentially involve more personnel in order to meet surge deployment requirements. The objectives of ETT include providing personnel with pre-deployment exposure to the infrastructure, force protection, and support challenges faced at a forward, austere air base environment that is not located in a secure rear area.

Existing facilities and services that will be used to support ETT include the dining hall; emergency response and security services; POL storage; contractor supplied bottled water service; and the munitions storage area. The munitions needed for ETT will include smoke grenades, ground burst simulators (GBS), and blank small arms ammunition. Building 41, or an AKSSS installed in that vicinity, also will be used for staging medical support for the medical personnel deployed from Luke AFB.

ETT will use the same expeditionary billeting and operations areas as proposed for AEF training, although use of the expeditionary operations area will likely be limited to classroom training, administrative, or medical support activities and not maintenance activities.

Personnel slated for ETT will be transported to Gila Bend AFAF from Luke AFB by bus and will remain at the airfield for the duration of the training course. Supplies or equipment needed for ETT that could not be transported with the personnel will be transported from Luke AFB by truck prior to the course in which they will be needed.

The required ETT syllabus includes development of individual and team war-fighting skills that would be needed at an expeditionary forward air base or during convoy operations and travel. Most ETT activities will be conducted at the Gila Bend AFAF but certain existing BMGR East roads will be used for convoy training. Convoy training typically will involve three to five vehicles with smoke grenades, GBSs, and blank small arms ammunition used during some combat skills training activities to enhance the realism of the training. The ETT syllabus also requires that all personnel successfully complete the Tactical Rifle Qualification Course with the M-16 rifle. M-16 rifle qualification will occur at the existing small arms range at Luke AFB. The BMGR East small arms range may be used to a limited extent for weapons familiarization training during some ETT exercises, but will not be used for weapons qualification at this time. All potential ETT use of the small arms range will be in accordance with its currently prescribed operating procedures and limitations.

Environmental Compliance and No-action Alternative

An environmental assessment (EA) was prepared to comply with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality regulations that implement NEPA, and the Air Force Environmental Impact Analysis Process promulgated in Title 32 of the Code of Federal Regulations Part 989. Two alternatives—the proposed action and no-action alternative—are fully considered in the EA. The purpose of the proposed action alternative, as described above, is to provide military personnel, particularly those in the 56 FW, with more realistic expeditionary training in a facility that simulates the conditions at a remote, deployed location and by conducting the training in an environment similar to that experienced in actual combat conditions. The need for the proposed action is to ensure that military personnel are trained in realistic conditions so they are better equipped to fight and survive in combat situations. Training in both flying and ground-based expeditionary combat skills has become increasingly relevant in the global war on terrorism.

The no-action alternative would be to continue ETT for 56 FW personnel at Luke AFB. The field training would continue to be conducted in the northwest corner of the airfield and the M-16 rifle training would be conducted at the Tactical Rifle Qualification Course. Personnel would reside in their regular quarters at night rather than experience the expeditionary living environment. Similarly, ETT-like training for personnel at other air installations in the BMGR East region that are most likely to use the proposed Gila Bend AFAF expeditionary training area would continue to occur at those installations and use existing, locally available training resources.

Flying training associated with AEF would continue to occur within BMGR East airspace with the sorties continuing to be generated from Luke AFB or other regional air installations. Aircraft maintenance and other support personnel would continue to operate from the existing facilities at Luke AFB or other regional installations, although the conditions and facilities at these permanent installations do not simulate an austere forward air base environment.

2. Anticipated Environmental Impacts

Airspace and Range Operations. AEF training will shift 3,120 to 3,600 annual sorties that currently take-off/land at regional installations to take-off/land at Gila Bend AFAF; in terms of annual air operations, this equates to an approximately 10 percent increase from the current average levels of 34,000 annual operations and well below the maximum number of annual operations (45,000) at Gila Bend AFAF. There will be no effect on the airspace or flying operations at BMGR East and the proposed convoy training will not affect range operations.

Land Use. Use of proposed areas within the Gila Bend AFAF cantonment area for expeditionary billeting and operations activities will dedicate these currently unutilized areas to these land uses. Some existing land uses (including those at Gila Bend AFAF, BMGR East roads used for convoy training, and small arms range for weapons familiarization training) will be used to support the proposed AEF and ETT training. The proposed land uses will be compatible with existing land use and other adjacent existing land uses.

Ground Transportation and Utilities. There will be slight increases in vehicles using Gila Bend AFAF roads during periods of AEF and ETT training. Some minimal and intermittent localized congestion or change in transportation patterns may occur as various exercises are conducted and equipment and supplies are positioned. The use of existing utilities infrastructure to accommodate up to 32 kilowatt hours per day per AKSSS, process 7,200 gallons of wastewater, and provide telecommunications needs will be within existing capacity; existing bottled water service for drinking water will be expanded to accommodate expeditionary training demand.

Noise. Intermittent increases in the Gila Bend AFAF noise environment will occur as a result of proposed expeditionary training. Noise generated from AEF air operations that will takeoff/land at Gila Bend AFAF rather than other regional installations will be the greatest source of noise, but average noise exposure levels will be on an order of magnitude consistent with the noise exposure modeling used to evaluate compatibility of land uses within noise exposure zones at Gila Bend AFAF. Similarly, noise exposure from aircraft operations at Luke AFB and other regional installations will not be expected to appreciably change as a result of the change in venue for AEF to Gila Bend AFAF. Noise from operation of ground equipment/vehicles and human activity will be compatible with existing and ongoing land uses within the potentially affected areas at Gila Bend AFAF and BMGR East.

Public and Occupational Health and Safety. No public health or safety impacts are anticipated. Occupational health and safety risks associated with proposed expeditionary training will be managed in accordance with applicable policy. The combat-deployed troops that participate in the proposed training will potentially benefit from the “train as you fight” experience.

Cultural Resources. Based on a 100 percent survey of the Gila Bend AFAF and ongoing consultation with Native American communities, no sites eligible for listing on the National Register of Historic Places or to traditional cultural places will be affected by the proposed action.

Socioeconomics. The proposed action will have no measurable effect on the community of Gila Bend or unincorporated areas of Maricopa County located near Gila Bend AFAF. The direct and induced economic impact of expenditures related to expeditionary training will be broadly distributed across various economic sectors and negligible in context of the greater southern Arizona economy. The social environment at Gila Bend AFAF will vary during active expeditionary training events, but will be consistent with the expected condition on a military installation.

Hazardous Materials and Waste. The existing programs for managing hazardous materials and wastes at Gila Bend AFAF and BMGR East will be expanded to accommodate the use of POLs and some munitions. The generation of hazardous waste, human waste, and municipal solid waste associated with the proposed expeditionary training will be addressed in accordance with federal, state, and local laws, rules, and regulations, resulting in no adverse effects.

Earth Resources. There will be localized and short-term ground disturbance from site preparation activities at the expeditionary training sites (e.g., earth movement, pouring concrete pads for the AKSSSSs, and establishing utilities). The associated potential for soil erosion, fugitive dust propagation, sedimentation, and soil contamination from the use of hazardous materials and POLs will be minimized by the slight soil erosion hazard found at Gila Bend AFAF, site characteristics (e.g., topography and layout), and application of erosion control best management practices and spill response protocols.

Water Resources. Potential temporary minor adverse impacts to surface water from increased sedimentation or released pollutants will be largely confined to the initial site preparation activities and minimized through the application of best management practices and pollution prevention programs. The potential minor level of impacts to the down gradient Quilotosa Wash will be localized and limited in duration. Groundwater use will be minimal and used primarily for dust control. Ongoing impacts to surface waters resulting from expeditionary training activities (i.e., as a result of increased sediment in surface water runoff and soil contamination) will be minimal to non-existent.

Air Quality. The area of potential effect is in an attainment area for all National Ambient Air Quality Standards for criteria pollutants and all emissions will be well below *de minimus* levels applied to non-attainment areas. Short-term air emissions (primarily in particulate matter) resulting from site preparation activities will be managed via a Dust Control Plan. Long-term air emissions will be dominated by the shift in aviation operations from Luke AFB and other regional installations to Gila Bend AFAF, but will also include emissions from ground operations (i.e., transport of troops, use of BMGR convoy routes, and use of munitions).

Biological Resources. Because most of area to be used for expeditionary training has been previously disturbed and cleared of vegetation, there will be negligible impacts to native vegetation and wildlife habitat. Common rodents and reptiles may be affected at the Gila Bend AFAF sites and a more diverse assortment of wildlife species may be minimally affected on a short-term and intermittent basis by use of BMGR existing roads for expeditionary convoy training. Most special status species potentially occurring within the area of potential effect (lesser long nosed bat, Southern yellow bat, Sonoran pronghorn, and cactus ferruginous pygmy owl) will not be affected. The desert tortoise may be encountered along the proposed BMGR East convoy training routes and the California leaf-nosed bat may forage in portions of the area of potential effect, but no adverse impacts to these species are expected.

Environmental Justice. No significant adverse effects are anticipated so there will be no environmental justice effects.

3. Comments on the Environmental Assessment

During the review period for this draft EA, comments were received from Arizona Game and Fish Department and the Arizona State Historic Preservation Office. These responses are included in Chapter 6 of the Final EA. The Arizona Game and Fish Department indicated that the agency reviewed the draft EA and does not foresee any significant adverse impacts to wildlife resulting from implementation of the proposed action. The Arizona State Historic Preservation Office concurred that no historic properties will be affected by the proposed action.

Air Force internal reviewers provided clarification on the following:

- ***AEF training duration and number of flying operations:*** The draft EA had indicated that AEF training would involve aircraft flying at BMGR East for three to four days during the week-long AEF courses and that 1,560 training sorties would be associated with the proposed action. Clarifications were made to indicate that AEF training at Gila Bend AFAF will involve aircraft flying operations at BMGR East on five days during each of the week-long AEF courses. Further, it was clarified that each AEF course will result in approximately 156 to 180 operations at Gila Bend AFAF, equating to an increase of approximately 3,120 to 3,600 annual flying operations at Gila Bend AFAF if 20 AEF courses occur annually. These changes required corresponding changes to clarify the number of operations in various sections of the impact analysis, but (with the exception to minor changes in air emissions calculations) these changes did not change the analysis of impacts to environmental resources.
- ***AEF training surge:*** The draft EA indicated that each AEF training deployment would last one week and typically would involve 10 to 12 aircraft and approximately 120 personnel. The final EA was revised to indicate that atypically, during training surges, AEF deployments may involve up to 18 aircraft and personnel requirements may increase to approximately 250 persons. This change did not alter the impact assessment.
- ***Fuel bladder for AEF training.*** The Air Force identified that a collapsible fuel bladder may be used to provide additional aircraft fuel storage. This was not considered in the draft EA. The final EA has been modified to indicate that such a pressure tested rubber fuel bladder may be used in AEF training and would pragmatically be sited next to the existing fuel park or ramp; however, it could be placed anywhere accessible to a large (R-11) fuel truck. In accordance with Air Force Handbook 10-222, Volume 2 (U.S. Air Force 1996), if such a bladder were to be used, it would be installed on an even surface and protected with berms and secondary containment. Minor changes were made to the impact assessments for hazardous materials and waste and earth resources to account for this potential use.
- ***ETT training duration:*** The draft EA had indicated that each deployment typically will last three days. The final EA was revised to indicate that this may be expanded to four or five days to provide additional time for travel and setup.
- ***Next generation aircraft:*** The draft EA cumulative effects analysis (Section 4.15) presented information about the potential cumulative effects of the proposed action in combination with other past, present, and foreseeable future actions. The noise analysis for the F-35 was included as potential successor aircraft to those operating at Gila Bend AFAF (F-16 and A-10) as it was in the Joint Land Use Study for the Gila Bend AFAF and BMGR prepared by the Arizona Department of Commerce in February 2005. The Air Force added clarification to the final EA to indicated that basing decisions for next generation aircraft that may operate in the region and at Gila Bend AFAF have not yet been made and that the analysis of potential noise from next generation aircraft is illustrative rather than representative.

The Yuma Valley Rod and Gun Club submitted a comment on the final EA that says the club "...supports implementing two recurring training programs, Air Expeditionary Force Training and Expeditionary Thunderbolt Training and developing capable programs to support these training exercises at AFAF."

4. Finding of No Significant Impact

Based on a detailed analysis of environmental issues in the EA, the Air Force's proposal to establish expeditionary training at the Gila Bend AFAF and BMGR East does not constitute a major federal action significantly affecting the quality of the human environment. The current analysis completes the requirements pursuant to NEPA and its regulations promulgated by the Council on Environmental Quality, and the Air Force Environmental Impact Analysis Process. Therefore, an environmental impact statement is not required.



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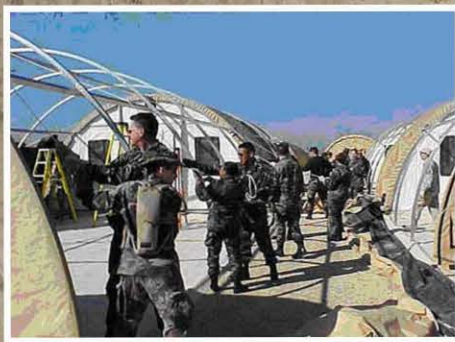
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Proposed Expeditionary Training at the Gila Bend Air Force Auxiliary Field and the Barry M. Goldwater Range



**56th Fighter Wing
Range Management Office
Luke Air Force Base**



December 2005

FINAL

Environmental Assessment for the Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field and Barry M. Goldwater Range East

Lead Agency: U.S. Air Force, Luke Air Force Base

Title of the Proposed Action: Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field (AFAF) and Barry M. Goldwater Range (BMGR) East

Affected Jurisdictions: State of Arizona, Maricopa County

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ABSTRACT

In response to a new emphasis on training in increasingly relevant expeditionary combat skills, the Air Force proposes to (1) implement two recurring, pre-deployment expeditionary training programs at Gila Bend AFAF: Air Expeditionary Force (AEF) training and Expeditionary Thunderbolt Training (ETT) and (2) develop training capabilities at Gila Bend AFAF to support these programs. The 56th Fighter Wing currently conducts these programs at Luke AFB with flight operations at BMGR East, but the Air Force proposes to relocate the training to the more austere environment available at the Gila Bend AFAF to simulate the conditions at a remote, deployed location and to train in an environment similar to that which may be encountered in combat deployments. It is anticipated that other BMGR users, such as Davis-Monthan AFB and the Army National Guard, would use the training facilities if they were established at the Gila Bend AFAF.

The AEF training deployments would last one week, occur up to 20 times per year, involve 10-12 aircraft and up to 120 people, and would relocate approximately 3,120 to 3,600 take-off and landing operations to the Gila Bend AFAF from the installations from which they currently originate. ETT deployments would typically last three days (but could be up to five days), occur up to 50 times per year, involve approximately 30 to 50 people, and principally be limited to training at Gila Bend AFAF (but certain existing BMGR East roads would be used for vehicle convoy training). Two new expeditionary training areas are proposed at previously disturbed sites at Gila Bend AFAF: an operations area near the flight line and an expeditionary billeting area at a site formerly used for family housing. Aluminum framed tents and associated infrastructure would be erected at these sites and some existing support facilities and services would be used in support of the proposed training. The no-action alternative is to continue to conduct expeditionary training in the manner that it currently occurs today, at installations that less accurately represent expected combat deployment conditions.

The potential environmental effects of these alternatives are discussed in regard to airspace and range operations, land use, ground transportation and utilities, noise, public and occupational health and safety, cultural resources, socioeconomic resources, hazardous materials and waste, earth resources, water resources, air quality, biological resources, and environmental justice. No significant impacts were identified during the impact assessment.

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LIST OF ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
ACC	Air Combat Command
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AEF	Air Expeditionary Force
AETC	Air Education and Training Command
AFAF	Air Force Auxiliary Field
AFB	Air Force Base
AFI	Air Force Instruction
AFRC	Air Force Reserve Command
AGFD	Arizona Game and Fish Department
AKSSS	Alaska small shelter system
ANG	Air National Guard
APZ	Accident Potential Zone
ARNG	Army Reserve National Guard
AUX	auxiliary field
AZPDES	Arizona Pollutant Discharge Elimination System
BDU	bomb dummy unit
BMGR	Barry M. Goldwater Range
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CSAR	combat search and rescue
CWA	Clean Water Act
dB	decibels
DoD	Department of Defense
EA	environmental assessment
EIS	environmental impact statement
EOD	explosive ordnance disposal
EPA	Environmental Protection Agency
ETT	Expeditionary Thunderbolt Training
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	finding of no significant impact
FW	Fighter Wing
GBS	ground burst simulators

HMMWV	high-mobility multipurpose wheeled vehicles
HVAC	heating, ventilation, and air conditioning
INRMP	Integrated Natural Resource Management Plan
Ldn	day-night average sound level
mg/m ³	milligrams per cubic meter
MSA	munitions storage area
MSL	mean sea level
NAGPRA	Native American Graves Protection and Repatriation Act
NAAQS	national ambient air quality standards
NHPA	National Historic Preservation Act
NEPA	National Environmental Policy Act
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
POL	petroleum, oil and lubricants
P.L.	public law
PM _{2.5}	particulate matter with an aerodynamic diameter of less than 2.5 microns
PM ₁₀	particulate matter with an aerodynamic diameter of less than 10 microns
ppm	parts per million
RMCP	range munitions consolidation point
RMO	Range Management Office
RV	recreational vehicle
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SPCC	spill prevention control and countermeasure
SWPPP	storm water pollution prevention plan
TAC	tactical range
UFC	unified facilities criteria
U.S.C.	United States Code
UST	underground storage tanks
WAATS	Western Army National Guard Aviation Training

1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

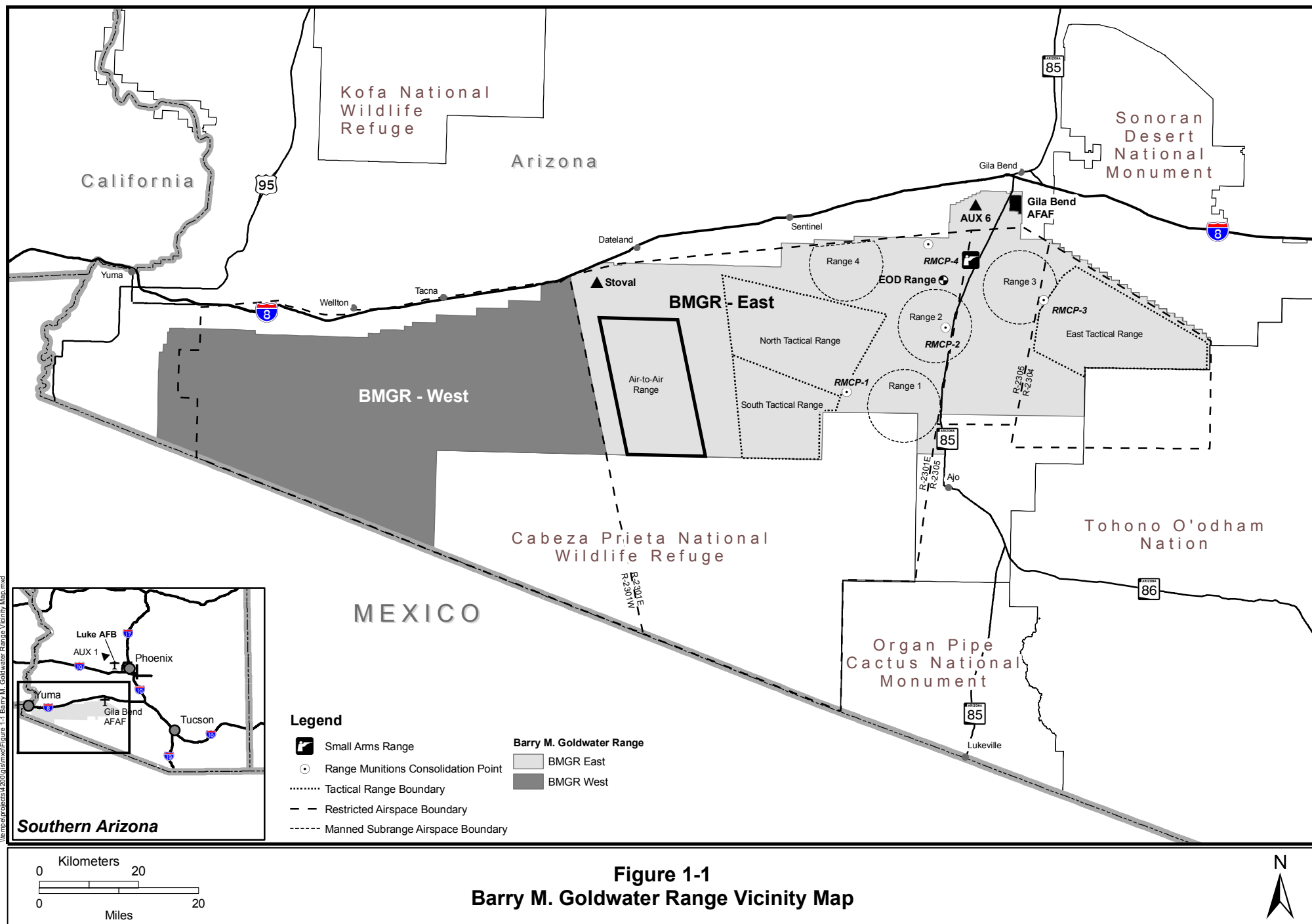
Military deployments to Afghanistan and Iraq in recent years have compelled the Air Force to reexamine its training programs. A new emphasis has been placed on expeditionary combat skills, which have become increasingly relevant to the war on terrorism. The 56th Fighter Wing (FW) currently conducts both flying and ground-based expeditionary training at Luke Air Force Base (AFB), which is located in Glendale, Arizona, situated in the west valley of the greater Phoenix metropolitan area; however, the value of the training would be enhanced if it were to occur at a facility that more realistically simulates the conditions at a remote, deployed location. Consequently, Luke AFB proposes to standup two training programs at the Gila Bend Air Force Auxiliary Field (AFAF): (1) Air Expeditionary Force (AEF) involving flight exercises and (2) Expeditionary Thunderbolt Training (ETT) involving ground-based exercises. The proposal also involves training within the eastern portion of the Barry M. Goldwater Range (referred to as BMGR East).

1.2 BACKGROUND

1.2.1 Barry M. Goldwater Range East

BMGR East is a military aviation training range assigned to the Air Force by the U.S. Congress for use in training aircrews to employ combat aircraft as tools for national defense. BMGR East is a part of the larger BMGR, located in southwestern Arizona, which also includes BMGR West, operated by the U.S. Marine Corps (Figure 1-1). The current primary mission of BMGR East is to support the training of Air Force, Air Force Reserve Command (AFRC), Air National Guard (ANG), and Army National Guard (ARNG) aircrews transitioning to frontline combat aircraft. Regular users currently served in this capacity by BMGR East include the:

- Air Education and Training Command (AETC), 56 FW, Luke AFB, which trains Air Force F-16 aircrews
- Air Combat Command (ACC), 355th Wing, Davis-Monthan AFB, which trains all Air Force A-10 and OA-10 aircrews AFRC, 944 FW, Luke AFB, which trains AFRC F-16 aircrews
- ANG, 162 FW, Tucson International Airport, which trains F-16 aircrews for the ANG and U.S. foreign allies that are recipients of Foreign Military Sales F-16s
- ARNG, Western ARNG Aviation Training Site (WAATS), Silverbell Army Heliport, which trains UH-60, AH-1, and AH-64 aircrews
- Air Force Special Operations Command (AFSOC), 563rd Rescue Group, Davis-Monthan AFB, which trains for combat search and rescue operations and uses the HH-60 and HC-130



In addition to these regular users from the region, the range is also used to support training by "casual users" from outside the local flying area. These important casual user training deployments originate from active duty, reserve, and ANG flying units from other areas of the country and from U.S. and allied units from overseas.

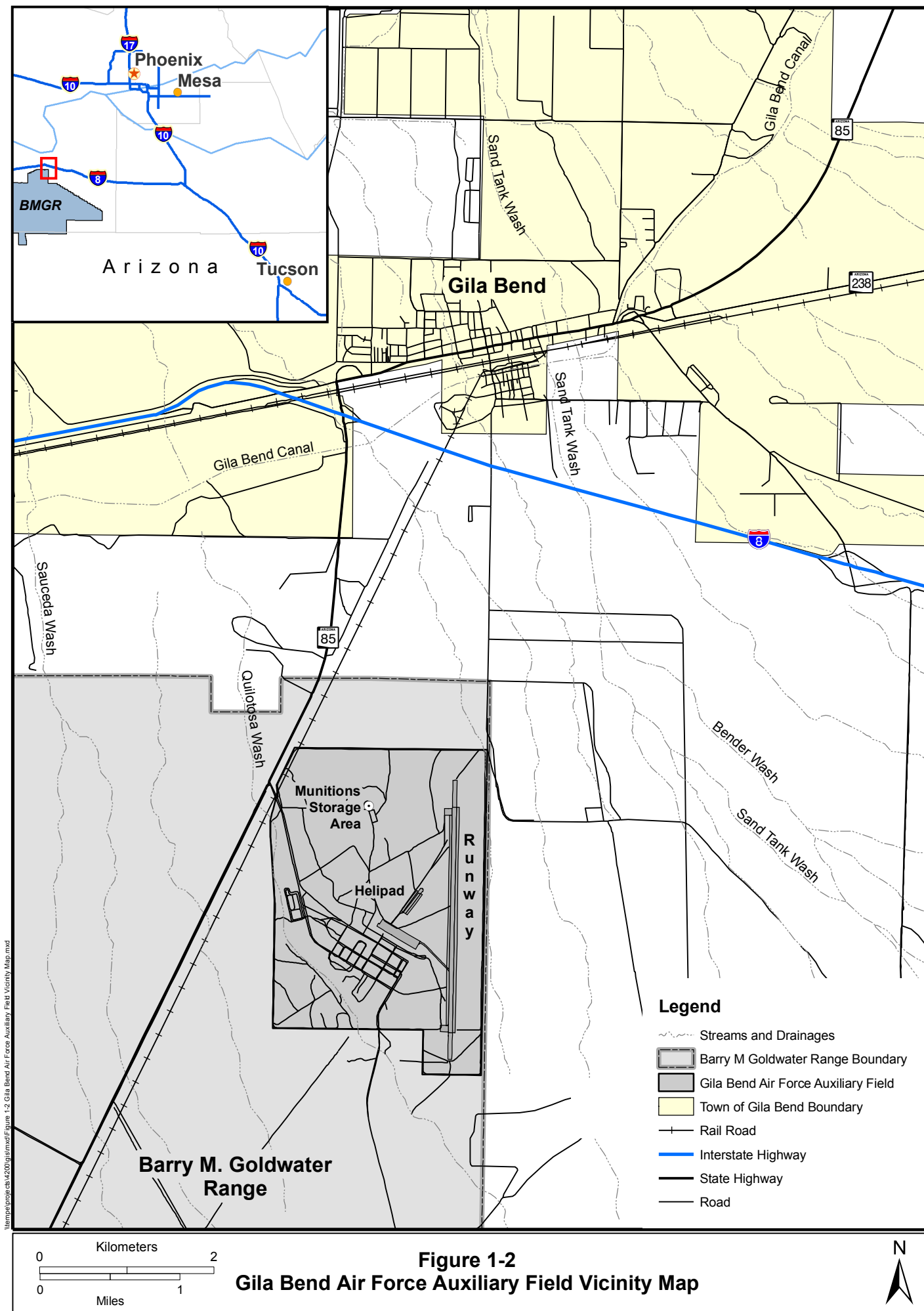
The BMGR East land area is currently subdivided into eight aviation subranges, one Air Force auxiliary airfield, two outlying auxiliary airfields, one Explosive Ordnance Disposal (EOD) training range, one small arms range, and four weapons range support areas (see Figure 1-1).

1.2.2 Gila Bend Air Force Auxiliary Field

The Gila Bend AFAF is a 1,885-acre installation located in southwestern Maricopa County approximately five miles south of the Town of Gila Bend, Arizona and east of State Route 85, as shown on Figure 1-2. The Gila Bend AFAF is located in the northeastern portion of the BMGR East, which has been withdrawn and reserved for military use, most recently by Public Law (P.L.) 106-65. BMGR East, including the Gila Bend AFAF, consists of more than 1 million acres of land, and is reserved for use by the Secretary of the Air Force. Luke AFB administers, manages, and is the primary user of BMGR East and the Gila Bend AFAF.

The Gila Bend AFAF includes an 8,500-foot by 150-foot fixed-wing aircraft runway and a six-pad heliport. There are 135 contract and six government employees who work at the auxiliary field during regular working hours, but the auxiliary field is staffed 24 hours a day, seven days a week (Sizemore 2005). An air traffic control tower provides air traffic control whenever Gila Bend AFAF is open; normal operating hours are 7 a.m. to 11 p.m. Monday through Friday. Flight line services (include a fire department, tie down ramp, aprons, and an aircraft hangar) are available at Gila Bend AFAF to support emergency or precautionary recoveries of military aircraft that experience in-flight emergencies or have hung ordnance during operations on the BMGR. These aircraft are repaired at Gila Bend AFAF by maintenance crews that travel from their home base to the auxiliary airfield for each event.

The runway is used routinely by aircrews from Luke AFB and Davis-Monthan AFB (in Tucson, Arizona) and the ANG 162 FW (in Tucson, Arizona). Approximately 34,000 operations per year are conducted at Gila Bend AFAF (Mendez 2005). Aircraft including F-16s from Luke AFB and A-10s from Davis-Monthan AFB routinely use the airfield for practicing traffic pattern and emergency simulated engine flameout (engine power loss) procedures. It is also used for emergency recoveries of military aircraft that experience malfunctions on BMGR and diversion of aircraft due to factors such as bad weather at their home base, unsafe ordnance, or low fuel. The total aircraft diversions to Gila Bend account for approximately 250 operations annually, with approximately 70 additional emergency and/or weather diversions (Arizona Department of Commerce 2005). The airfield is equipped with a simulated laser target transmitter that is used to practice



illuminating a target with a weapons system aiming laser. No weapons are actually employed at the airfield and no hazardous laser energy is emitted in this activity (U.S. Air Force 1999).

Helicopter aircrews from the WAATS including the 1-285 Attack Helicopter Battalion (in Marana, Arizona) use Gila Bend AFAF as a forward operating area to support live-fire training that occurs in select locations within the BMGR. These activities include aircrew changes and helicopter refueling and rearming. The Gila Bend Munitions Storage Area (MSA) complex supports the rearming operations.

Gila Bend AFAF also houses support facilities for the control, maintenance, EOD clearance, and security of the BMGR, including the BMGR Security Police Office. The auxiliary field hosts approximately 20 deployments to the BMGR annually involving between 30 and 150 military personnel. While these deployments are conducted year round, the majority typically occur during the months of October through April (Sizemore 2005).

The Gila Bend AFAF is open to recreational use by military personnel and military retirees. The installation maintains 41 family camping spaces, which are generally full from October through April (Sizemore 2005).

1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide military personnel, particularly those in the 56 FW, with more realistic expeditionary training in a facility that simulates the conditions at a remote, deployed location and by conducting the training in an environment similar to that experienced in actual combat conditions. The need for the proposed action is to ensure that military personnel are trained in realistic conditions so they are better equipped to fight and survive in combat situations. Training in both flying and ground-based expeditionary combat skills has become increasingly relevant in the global war on terrorism.

1.3 ENVIRONMENTAL COMPLIANCE

This Environmental Assessment (EA) has been prepared to comply with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations that implement NEPA, and the Air Force Environmental Impact Analysis Process promulgated in Title 32 of the Code of Federal Regulations (CFR) Part 989. The regulations and directives of other agencies with jurisdiction and environmental responsibilities for the Gila Bend AFAF have provided additional guidance.

The purpose of an EA is to discuss the need for the proposed action, alternatives to the proposed action, and the environmental consequences of the proposed action and alternatives. This information provides the basis for the agency to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact

(FONSI). This information provides the basis for the Air Force to determine one of the following five courses of action:

- (1) If the consequences of the proposed action are judged to be insignificant, a FONSI could be issued and signed and the Air Force could then proceed with the proposed action.
- (2) If the consequences of the proposed action are judged to be significant, but the proposal may be modified to reduce or eliminate environmental impacts, the Air Force could modify the proposed action to support a FONSI, issue and sign the FONSI, and then proceed with the proposed action.
- (3) If the consequences of the proposed action are judged to be significant, but could be mitigated to an insignificant level, a FONSI that includes specific terms for mitigation of impacts could be issued and signed and the Air Force could then implement the mitigation measures and proceed with the proposed action.
- (4) If the consequences of the proposed action are judged to be significant and those impacts cannot be mitigated to an insignificant level, the Air Force could decide to prepare an EIS and issue and sign a Record of Decision prior to the implementation of the proposed action.
- (5) The Air Force could decide not to pursue the proposed action.

The use of the term “significant” (and derivations thereof) in this EA is consistent with the definition and guidelines provided in the CEQ regulations that implement NEPA (40 CFR 1508.27), which require consideration of both the context and intensity of impacts.

1.4 REQUIRED PERMITS, LICENSES, AND ENTITLEMENTS

The Air Force would be required to obtain or amend the existing Gila Bend AFAF earthmoving block permit issued by the Maricopa County Department of Environmental Services, Air Quality Division to address the air emissions and dust associated with site preparation ground disturbance.

Activities associated with development of the proposed expeditionary training and billeting areas would disturb greater than one acre of ground, and are thus subject to conditions of the National Pollutant Discharge Elimination System (NPDES) program, administered in Arizona by the Arizona Department of Environmental Quality (ADEQ) under the Arizona Pollutant Discharge Elimination System (AZPDES) program. Prior to ground disturbing activities, either a Permit Waiver Certification would be obtained (if the project qualifies) or an AZPDES Stormwater Notice of Intent (NOI) form under the Arizona Construction General Permit (AZPDES permit, permit number AZG2003-001) would be submitted to the ADEQ.

1.5 SCOPE AND ORGANIZATION OF THIS ASSESSMENT

The resource categories determined relevant to the proposed action and no-action alternatives include airspace and range operations, land use, utilities, transportation, recreation, hazardous materials and waste, public and occupational health and safety, air quality, noise, biological resources, earth resources, water resources, cultural resources, socioeconomic resources, and environmental justice. Chapter 2.0 of this EA provides a description of the proposed action, no-action alternative, alternatives eliminated from detailed consideration, and a comparison of the alternatives. The existing conditions of the relevant resources are described in Chapter 3.0. An evaluation of the possible environmental consequences on each environmental resource that would result from implementing the proposed action or no-action alternative is presented in Chapter 4.0 along with an analysis of cumulative effects; irreversible and irretrievable commitment of resources; and compatibility with land use plans, policies, and controls. The remaining sections of the document consist of lists of preparers, persons and agencies consulted in the preparation of the EA, persons and organizations receiving the draft EA, and references.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVE A – PROPOSED ACTION

The proposed action is to (1) implement two recurring, expeditionary training programs at Gila Bend AFAF and (2) develop training capabilities at that installation to support these programs. Gila Bend AFAF is proposed as the site for these training programs because it would provide an environment that realistically simulates the conditions that may be encountered at a primitive, forward air base. These programs are designed to provide military personnel scheduled for deployment with the up-to-date knowledge, skills, and war-fighting mentality that are needed to survive and operate effectively in a high threat environment where there are no completely secure rear areas of operation. The two pre-deployment training programs include AEF training for aircraft aircrews, aircraft maintenance personnel, and air operations planning personnel and ETT for other ground personnel. AEF training deployments would involve the generation of air combat training sorties to BMGR East from Gila Bend AFAF. ETT deployment would be limited principally to Gila Bend AFAF but would use certain existing BMGR East roads for vehicle convoy training.

2.1.1 Air Expeditionary Force Training

The proposed recurring AEF training deployments to Gila Bend AFAF would occur up to 20 times per year. The objectives of AEF training include:

- Instilling an expeditionary mindset in personnel scheduled for deployment
- Giving pilots and other aircrew members the opportunity to deploy, plan, and execute live-fire, air combat flight operations from an unfamiliar, forward location
- Preparing aircraft maintainers with a realistic experience in effectively generating air combat sorties from a forward austere base environment
- Providing personnel with pre-deployment exposure to the infrastructure, force protection, and support challenges faced at a forward, austere air base environment that is not located in a secure rear area

Ten of the 20 annual AEF training deployments would be from the 56 FW and 944 FW at Luke AFB and involve F-16 aircraft, pilots, and aircraft maintenance and air operations planning personnel. An estimated 10 additional annual deployments likely would be generated either from various other air installations in southern Arizona or from units that seasonally deploy to these installations for readiness training. The other air installations include the 355 Wing at Davis-Monthan AFB, Tucson; 162 FW at the Arizona Air National Guard Station, Tucson International Airport; and WAATS, Silverbell Army Heliport at Marana. The need to provide AEF training to Luke AFB personnel was the impetus for proposing the development of expeditionary training capabilities at Gila Bend AFAF. The BMGR, however, also is used regularly by units from the other aforementioned installations, which also have AEF training requirements. The size of the expeditionary training capabilities at Gila Bend AFAF that is proposed in this EA is

based in part on the reasonably foreseeable presumption that, once these capabilities are installed, Gila Bend AFAF would be valued as a regional training site for pre-expeditionary deployment training. Thus, the capacity of the proposed expeditionary training capabilities at Gila Bend AFAF has been sized to accommodate the likely regional training load.

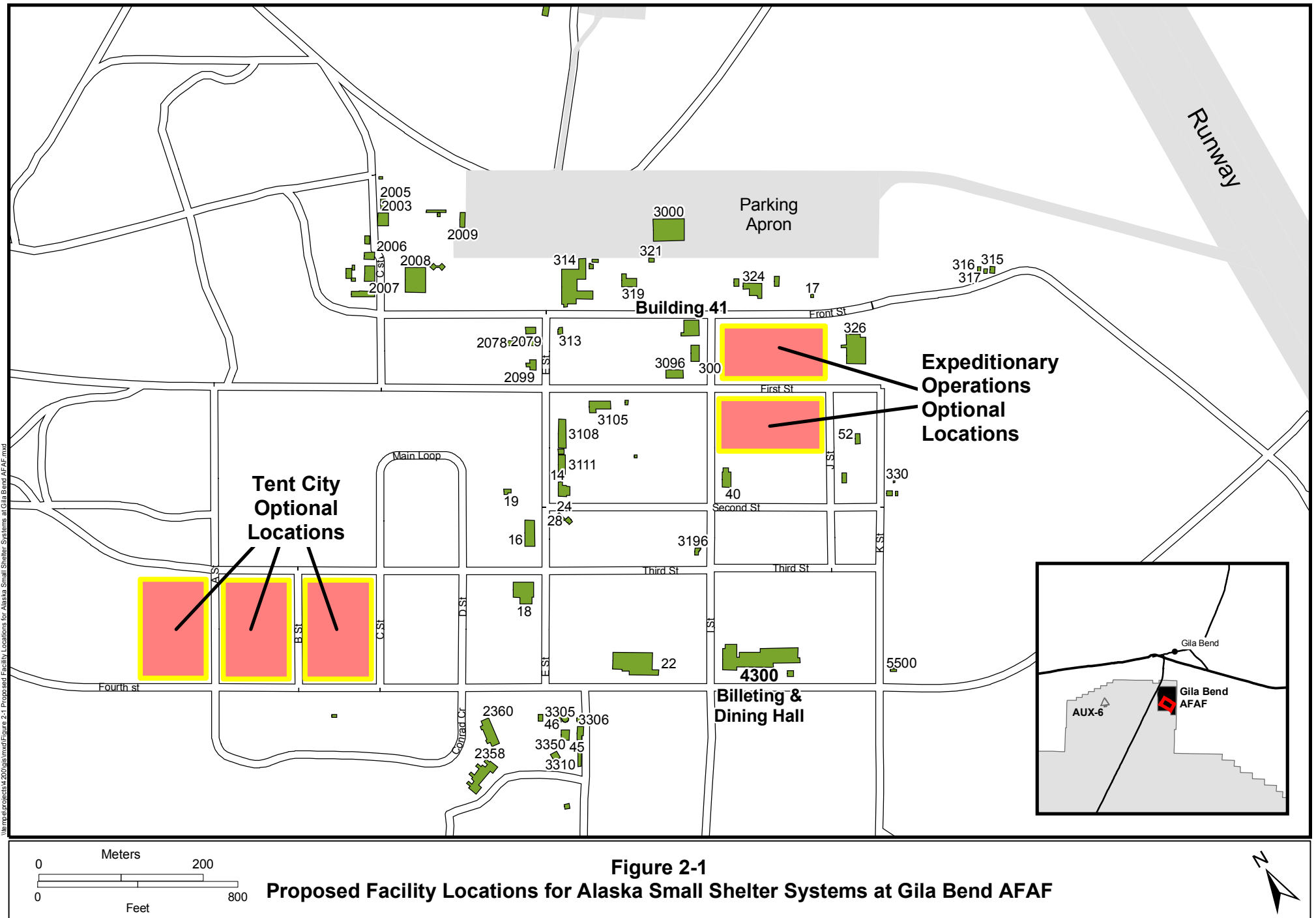
Each AEF training deployment would last one week and typically would involve 10 to 12 aircraft and approximately 120 personnel. Although atypical, during training surges, AEF deployments could involve up to 18 aircraft and personnel requirements could increase to approximately 250 persons. Training deployments from Luke AFB and 162 FW would involve F-16 aircraft. Deployments from the 355 Wing could involve A-10, OA-10, C-130, and/or HH-60 aircraft. Deployments from the WAATS would involve AH-1, AH-64, and/or UH-60 aircraft. Davis-Monthan AFB and the 162 FW also support a seasonal training program known as Operation Snowbird, which hosts Air National Guard units that conduct training deployments to Arizona to avoid seasonally inclement training weather at their home installations. Units participating in Operation Snowbird potentially could elect to conduct AEF training at Gila Bend AFAF. In addition to the aforementioned aircraft types, Operation Snowbird squadrons may employ the F-15E aircraft in AEF training.

AEF Training Use of Existing Support Facilities and Services at Gila Bend AFAF

Aircraft deployed to Gila Bend AFAF for AEF training would be parked and serviced on the existing aircraft parking apron at the airfield (Figure 2-1). Aircraft service or maintenance that could not be accomplished in the open on the apron would be performed within an existing shelter adjacent to the apron.

The existing Gila Bend dining hall, collocated with the permanent airfield billeting facility, would be used to provide food services to personnel attending AEF training. This training activity also would be supported by existing fire, emergency response, and security services at the airfield. Medical teams deployed to support expeditionary training would stage their services either out of Building 41 or the expeditionary operations area that would be erected nearby as described in the following section. The medical personnel needed to support AEF training would be deployed to Gila Bend AFAF from the sponsoring training unit or home installation. Gila Bend AFAF does not have the personnel resources to provide medical services for expeditionary training.

Storage for petroleum, oil, and lubricants (POL) and for munitions is already in place at Gila Bend AFAF. POL would be available for servicing aircraft and vehicles used for AEF training. The MSA also would be available to support munitions storage needed for this training. Munitions needed for AEF training would be delivered to Gila Bend AFAF through ongoing requisitioning procedures and in accordance with applicable safety standards. Inert training ordnance, such as Bomb Dummy Unit-33s (BDU-33) and 20mm cannon practice ammunition, would be the principal ordnance uploaded onto aircraft at



Gila Bend AFAF for AEF training. All ordnance delivery missions flown on the BMGR East for AEF training would be performed in accordance with currently approved procedures established by the 56 FW and Air Force, and also in accordance with currently applicable Biological Opinions rendered under the Endangered Species Act.

New Support Capabilities Proposed at Gila Bend AFAF for AEF Training

Two new training areas are proposed for installation at Gila Bend AFAF to support AEF training. An expeditionary operations area would be developed near the existing base operations building and aircraft parking ramp and an expeditionary billeting area would be developed in or near the former family housing area at Gila Bend AFAF (see Figure 2-1).

AEF operations planning and logistics personnel would conduct their activities in the expeditionary operations area. Some aircraft maintenance activities also would be performed at this location. Personnel receiving AEF training would be housed in the proposed billeting area. AEF training instructors would be housed at the existing Gila Bend billeting facility. The expeditionary operations training area would be established in one or both of two previously disturbed but now vacant lots that are near the aircraft parking ramp (see Figures 2-1 and Photo 1). The billeting area would be established at one or more of three previously disturbed but now vacant lots located near the western perimeter of the Gila Bend AFAF cantonment area (see Figures 2-1 and Photos 2, 3, and 4).



Photo 1: Vacant lots proposed as the locations for the AEF expeditionary operations area



Photo 2: Two of the vacant lots proposed as the locations for the expeditionary billeting area. Power and sewer are directly available to the lot on the far side of the street but would have to be routed to the lot on the near side of the street.



Photo 3: Middle vacant lots proposed as a location for the expeditionary billeting area. Power and sewer would have to be routed to this lot.



Photo 4: Easternmost lots proposed for the expeditionary billeting area. Power and sewer are directly available to this lot, a former family housing site.

Infrastructure requirements at the expeditionary operations area would include the installation of up to five units of the Alaska Small Shelter System (AKSSS). Two of the AKSSSs would be used for command, operations, and logistics functions, two other shelters would house maintenance activities, and a possible fifth AKSSS would be used as a medical facility.

The AKSSS is a portable, lightweight, fabric coated shelter system that has an aluminum frame (Photo 5). The Air Force prefers these shelters to meet the billeting, office, and command post needs of forward deployed forces at austere air base environments. Each shelter is about 20 feet wide and 32 feet long and provides 640 square feet of usable internal space. The AKSSS may be erected over a wooden floor but a poured concrete



Photo 5: AKSSS of the type proposed for use at Gila Bend AFAF.

floor is preferred for more durable requirements. Poured concrete floors are proposed to support AEF training at Gila Bend AFAF as this will be a frequent recurring activity. Each AKSSS would be serviced with electrical power and a heating, ventilation, and air conditioning (HVAC) system located outside of each shelter. Electrical power is available to both of the lots that are proposed as sites for the expeditionary operations area. Sanitary human waste disposal would be accomplished either by connecting a standard portable latrine trailer to the existing waste water treatment system at Gila Bend AFAF or by providing portable toilets through an approved licensed contractor.

Infrastructure requirements at the proposed expeditionary billeting area would include the installation of 24 AKSSSs in the standard layout currently used for deployed locations (Figure 2-2). The Air Force initially may install only 12 AKSSSs as the expeditionary training programs ramp up to their full planned capacity. Each AKSSS that is configured for billeting can provide quarters for 12 individuals. Approximately 200 troops are anticipated as the maximum number of personnel that typically would be deployed to Gila Bend AFAF during those weeks when both AEF training and ETT occur simultaneously. An expeditionary billeting area consisting of up to 24 AKSSSs is proposed. Up to 288 people might be accommodated, if necessary, to support overlapping requirements. The billeting area would be designed to accommodate a 20 percent female training population. Some of the AKSSSs may be configured as classrooms. Existing electrical power infrastructure is available in the area proposed for the tent city. In addition to the AKSSSs, two prefabricated shower and latrine trailers would be installed in the billeting area and could be connected to the existing waste water treatment system at Gila Bend AFAF.

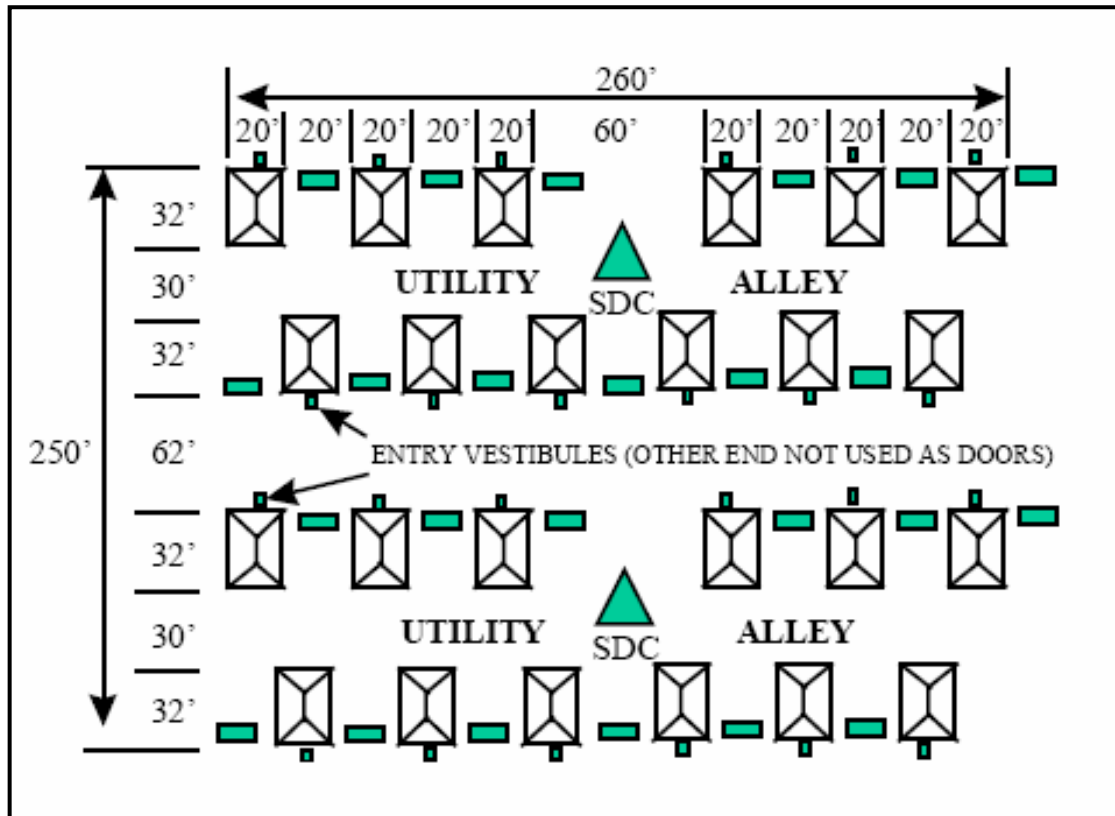


Figure 2-2 Standard Layout of a Tent City Composed of AKSSs

The AKSSs in the standard layout, commonly referred to as a tent city, are dispersed over an area of about 1.5 acres to provide force protection by minimizing the potential for a single attack to harm many of the tent city's occupants. The standard layout also includes a security setback of a minimum of 82 feet from roads accessible to vehicle traffic. This setback provides security forces with a clear area in which to detect and neutralize hostile actions directed towards the tent city occupants. The billeting area layout at Gila Bend AFAF would include security setbacks to provide its occupants and security force with firsthand training experience with force protection issues that will directly affect their safety in deployed areas of operations.

HESCO-brand or other barriers may be placed along sides of the tent city for additional protection. HESCO barriers are commonly used at forward deployed installations. These barriers are formed from wire mesh containers lined with heavy-duty plastic or fabric. They are easily transported when empty to a needed location and then filled with sand, dirt, or gravel to form a protective barrier (Photo 6). HESCO barriers are available in a variety of heights, widths, and lengths and can be



Photo 6: Assembly of HESCO barriers.

assembled in various combinations of rows and stacks to form a protective wall to resist anticipated threats from unauthorized intrusions (including moving vehicles) or enemy gunfire, rockets, or bombs. HESCO barriers also provide effective protection from which tent city occupants could defend themselves against attack. Fill for HESCO barriers at Gila Bend AFAF would come from commercial or other authorized sources outside of the airfield and BMGR.

Potable tap water is not available at Gila Bend AFAF. Potable bottled water would be furnished to those attending AEF training through a commercial contract that currently provides bottled water to Gila Bend AFAF. This contract would be increased, as necessary, to provide an adequate potable water supply to troops attending AEF training.

A collapsible fuel bladder may be used to provide additional aircraft fuel storage. Such fuel bladders are constructed of pressure tested rubber materials and are typically used at forward deployed base environments. In accordance with Air Force Handbook 10-222, Volume 2 (U.S. Air Force 1996), such a bladder would be installed on a two-inch bed of sand and protected with continuous berms 4-foot high and 6-foot wide at the base and protective liners inside the bermed areas. This secondary containment area would be large enough to contain the full capacity of the fuel bladder plus an additional 25 percent of the bladder capacity to ensure that fuel would not overflow if rain water or other material collected in the containment area. If such a fuel bladder were to be used, it would pragmatically be sited next to the existing fuel park or ramp; however, it could be placed anywhere accessible to a large (R-11) fuel truck.

AEF Training and Logistics

Ground personnel would be transported to Gila Bend AFAF from Luke AFB by bus and would be required to remain at the airfield for the duration of the AEF training course. Supplies and equipment needed for AEF training would be transported from Luke AFB by tractor trailer truck prior to the course in which they would be needed.

AEF training at Gila Bend AFAF would involve aircraft flying operations at BMGR East on five days during each of the week-long AEF courses. Aircraft and aircrew would deploy from their home base on the first day of the course, conduct their training mission at BMGR East, and land at Gila Bend AFAF. During the next three days, flying training typically would involve approximately 22 to 26 sorties¹ of 1.5 hours duration each. On the final day of the course, aircraft would take off from Gila Bend AFAF and conduct a training mission at BMGR East before returning to their home base.

Each take-off and landing is counted as a flying operation, so each AEF course would result in approximately 156 to 180 operations at Gila Bend AFAF. (This assumes 12 landings on the first day, 22 to 26 take-offs and landings or 44 to 52 operations on each of the next three days, and 12 take-offs on the final day.) If 20 AEF courses occur annually, this would result in an increase of approximately 3,120 to 3,600 operations at the Gila Bend AFAF, but could be somewhat more if training surges employing more aircraft are necessary. Over the past 10 years, annual flying operations conducted at Gila Bend AFAF have averaged at about 34,000 operations with a low year of approximately 22,000 and a high year of approximately 45,000 operations (Mendez 2005). More than 50,000 sorties are conducted annually at BMGR East. While the sorties associated with AEF training would represent an increase in flying operations at the Gila Bend AFAF, they would not represent a change in flying activity at BMGR East as these training sorties are currently being generated out of Luke AFB, Davis-Monthan AFB, or WAATS. Changing the AEF training venue to Gila Bend AFAF would simply change the airfield from which the sorties would be generated and not the flying operations at BMGR East. The numbers and types of munitions delivery activities at BMGR East associated with AEF training also would not be affected by the deployment to Gila Bend AFAF.

2.1.2 Expeditionary Thunderbolt Training

The proposed ETT deployments to Gila Bend AFAF could occur up to 50 times per year with each deployment typically lasting three days, but this could be expanded to four or five days to provide additional time for travel and setup. Each deployment typically would involve 30 to 50 persons, although some individual ETT courses could involve more personnel in order to meet surge deployment requirements. The objectives of ETT are similar to those of AEF training and include:

- Instilling an expeditionary mindset in personnel scheduled for deployment
- Providing personnel with pre-deployment exposure to the infrastructure, force protection, and support challenges faced at a forward, austere air base environment that is not located in a secure rear area

¹ One sortie equals one flight by one aircraft. One sortie accounts for two operations – taking off and landing – at the airfield.

ETT Use of Existing Support Facilities and Services at Gila Bend AFAF

ETT would not require the use of the aircraft parking ramp at Gila Bend AFAF, as would AEF training, but would make use or benefit from other existing facilities and services at the airfield in the same manner as described for AEF training in Section 2.1.1. Existing facilities and services that would be used to support ETT include the dining hall; emergency response, and security services; POL storage; contractor supplied bottled water; and MSA. The munitions needed for ETT would include smoke grenades, ground burst simulators² (GBS), and blank small arms ammunition. Building 41, or an AKSSS installed in that vicinity, also would be used for staging medical support for ETT courses. Medical personnel would have to be deployed to Gila Bend AFAF from Luke AFB.

Proposed New Support Capabilities Proposed at Gila Bend AFAF for ETT

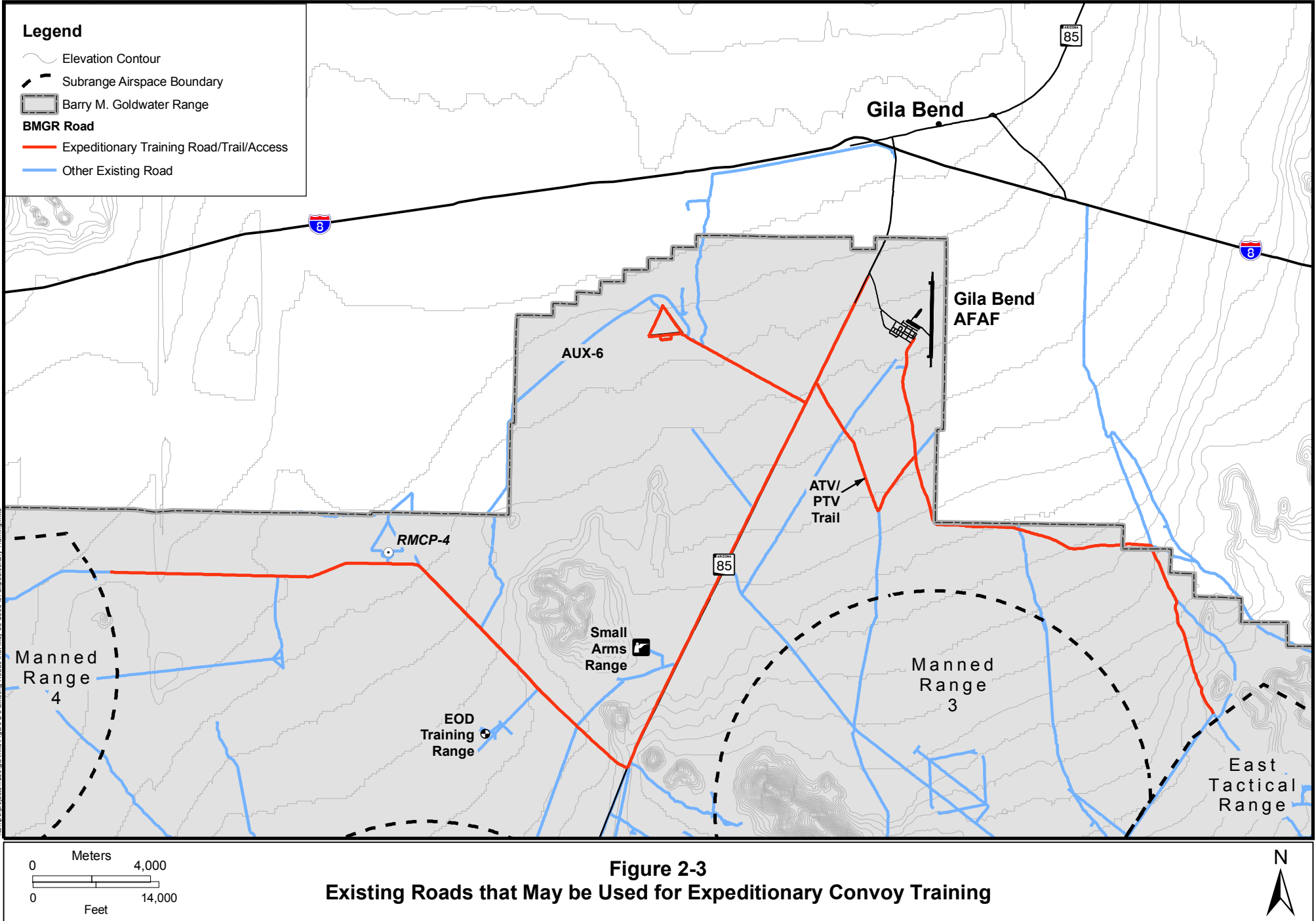
ETT would use the same expeditionary billeting and operations areas as proposed for AEF training, although use of the expeditionary operations area would likely be limited to classroom training, administrative, or medical support activities and not maintenance activities.

Training and Logistics

Personnel slated for ETT would be transported to Gila Bend AFAF from Luke AFB by bus and would be required to remain at the airfield for the duration of the training course. The transportation requirements of the proposed ETT deployments to Gila Bend AFAF would include one bus and two high-mobility multipurpose wheeled vehicles (HMMWV). Supplies or equipment needed for ETT that could not be carried by the bus or HMMWVs would be transported from Luke AFB by truck prior to the course in which they would be needed.

The required ETT syllabus includes development of individual and team war-fighting skills that would be needed at an expeditionary forward air base or during convoy operations and travel. Training at Gila Bend AFAF would cover the following core combat skills areas: individual and team movements; cover and concealment; defensive fighting positions and fighting; air base defense; night vision goggles and thermal imagery; noise, litter, and light discipline; explosives ordnance disposal and identification; enhanced self-help and buddy care; and convoy operations and travel. These ETT activities would be limited principally to Gila Bend AFAF but would use certain existing BMGR East roads for convoy training (Figure 2-3). Convoy training typically would involve three to five vehicles, usually 1.5-ton HMMWVs (Photo 7) and Duce-and-a-Half 2.5- or 5-ton trucks, designated respectively as the M-35 and M-36 (Photo 8). Smoke grenades, GBSs, and blank small arms ammunition would be used during some combat skills training activities to enhance the realism of the training. The ETT syllabus also requires that all personnel successfully complete the Tactical Rifle

² The ground burst simulator is a small pyrotechnic device that is used to create battle noises and flash effects during training. It produces a high-pitched whistle that lasts 2 to 4 seconds. The detonation produces a flash and loud report.



Qualification Course with the M-16 rifle. M-16 rifle qualification would occur at the existing small arms range at Luke AFB rather than at the Small Arms Range at BMGR East near Gila Bend AFAF (see Figure 1-1). The BMGR East Small Arms Range may be used to a limited extent for weapons familiarization training during some ETT exercises, but will not be used for weapons qualification at this time. All potential ETT use of the Small Arms Range would be in accordance with its currently prescribed operating procedures and limitations.



Photo 7: 1.5-ton HMMWV



Photo 8: M-35-A-2, 2.5-ton "Duce-and-a-Half" truck

2.2 ALTERNATIVE B – NO ACTION ALTERNATIVE

With the no-action alternative, ETT for 56 FW personnel would continue to occur at Luke AFB. The field training would continue to be conducted in the northwest corner of the airfield and the M-16 rifle training would be conducted at the Tactical Rifle Qualification Course. The ETT syllabus would continue to cover skills training in the care and firing of an M-16 rifle, qualification with the M-16, life saving, survival, convoy operations and travel, defensive fighting, and other war-fighting skills that are potentially needed in at expeditionary forward air base. Personnel would reside in their regular quarters at night rather than experience the expeditionary living environment. Similarly, ETT-like training for personnel at other air installations in the BMGR East region that are most likely to use the proposed Gila Bend AFAF expeditionary training area (e.g., Davis-Monthan AFB, 162 FW, and WAATS) would continue to occur at those installations and use existing, locally available training resources.

Flying training associated with AEF would continue to occur within BMGR East airspace with the sorties continuing to be generated from Luke AFB or other regional air installations. Aircraft maintenance and other support personnel would continue to operate from the existing facilities at Luke AFB or other regional installations, although the conditions and facilities at these permanent installations do not simulate an austere forward air base environment.

2.3 ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

As noted in Section 1.2, the purpose of and need for the proposed action is provide more realistic expeditionary training conditions so that military personnel are better prepared for actual combat conditions. The criteria used for selecting an expeditionary training site were based on the requirements of the 56 FW, the proponent of the proposed action at the Gila Bend AFAF. As the concept for developing an expeditionary training area within the BMGR East region evolved, however, other BMGR users expressed interest in using the expeditionary training capabilities proposed for the Gila Bend AFAF to satisfy their for expeditionary training. The expeditionary training requirements of the 56 FW training syllabus and those of the other regional air installations are essentially the same. The criteria for an ideal expeditionary training location within the BMGR East training area included:

- A relatively austere environment that could provide realistic expeditionary air base conditions
- Close operating proximity to Luke AFB, where personnel and equipment needed to support routine and on-going expeditionary training are located, while still providing a remote setting
- Near the BMGR to support the flying training associated with AEF training
- Scheduling priority as a regular installation/range user
- Viable runway to support AEF training
- Existing access, utilities, and/or security to minimize development and operational costs
- Previously disturbed areas that could be reused to minimize environmental impacts

While the proposed action at Gila Bend AFAF would satisfy the expeditionary training requirements of the 56 FW, and other regional air installations, other locations were considered. Auxiliary Field 1 (AUX-1) and Auxiliary Field 6 (AUX-6) were considered as potential expeditionary training sites because they would provide an austere environment that has previously disturbed land that is relatively near Luke AFB and BMGR East; however, neither of these auxiliary fields has a viable runway to support the flying operations that are essential to AEF training. While these locations could support ETT, the cost of developing separate training facilities for the two types of operations is cost prohibitive. AUX-1 and AUX-6 lack all utility infrastructure and would have to be provided with permanent power, water, sewer, and communication facilities. In addition, AUX-1 and AUX-6 both lack the full-time installation security that would be necessary to protect the AKSSSs, equipment, and deployed aircraft. AUX-6 also lacks an all-weather access road. Consequently, AUX-1 and AUX-6 were eliminated from detailed considerations.

Other locations that could provide a similar environment, such as in or near BMGR West or Nellis Air Force Range, were determined to be too far from Luke AFB and BMGR East to support routine and on-going expeditionary training requirements. In addition, the 56 FW (and other primary users of BMGR East—Davis-Monthan AFB, 162 FW, and WAATS) are classified as casual users rather than regular users at these ranges, and would not receive priority in scheduling range time for AEF exercises.

2.4 COMPARISON OF THE ALTERNATIVES

The predicted environmental consequences of Alternative A (the proposed action) and Alternative B (the no-action alternative) on the relevant environmental resource categories are presented in summary in Table 2-1 (begins on next page). The intent of this table is to present the findings of the EA with regard to the possible impacts of each alternative in an unbiased, concise, and comparative format.

**TABLE 2-1
COMPARISON OF THE ALTERNATIVES**

Resource	Alternative A – Proposed Action	Alternative B – No Action
Airspace and Range Operations	- No effect on the airspace or flying operations at BMGR East - AEF training would shift approximately 3,120 to 3,600 annual operations that currently occur at regional installations to occur at Gila Bend AFAF; in terms of annual air operations, this equates to an approximately 10 percent increase from the current average levels of 34,000 annual operations and remains well below the maximum number of annual operations (45,000) at Gila Bend AFAF - Proposed convoy training on existing roads would not affect BMGR East range operations	- No change to airspace or range operations - AEF and ETT training conducted by the 56 FW would continue to occur at Luke AFB; AEF take-offs and landings would continue to occur at Luke AFB and training/ordnance delivery would continue to occur at BMGR East - Other regional users would continue to conduct expeditionary training at their home installation or at other training locations to which they currently deploy
Land Use	- Use of proposed areas within the Gila Bend AFAF cantonment area for expeditionary billeting and operations activities would dedicate these currently unutilized areas to these land uses. Some existing land uses (including those at Gila Bend AFAF, BMGR East roads used for convoy training, and small arms range for weapons familiarization training) would be utilized to support the proposed AEF and ETT training - The proposed land uses would be compatible with existing land use and other adjacent existing land uses	- The empty lots at Gila Bend AFAF would remain unutilized until such time as a new compatible land use was identified for these areas - The lands at Luke AFB and other regional installations currently used for expeditionary training would continue to be used for such training to the extent that it can be accomplished at these installations
Ground Transportation and Utilities	- Negligible use of public roads and highways would occur in transit from home installations to deployment at Gila Bend AFAF - Slight increases in vehicle using Gila Bend AFAF roads during periods of AEF and ETT training; some minimal and intermittent localized congestion or change in transportation patterns may occur as various exercises are conducted and equipment and supplies are positioned - Use of existing utilities infrastructure to accommodate up to 32 kilowatt hours per day per AKSSS, process 7,200 gallons of wastewater, and provide telecommunications needs would be within existing capacity; existing bottled water service for drinking water would be expanded to accommodate expeditionary training demand	- No impacts to ground transportation predicted - No impacts to utilities predicted

**TABLE 2-1
COMPARISON OF THE ALTERNATIVES**

Resource	Alternative A – Proposed Action	Alternative B – No Action
Noise	- Intermittent increases in the Gila Bend AFAF noise environment would occur as a result of proposed expeditionary training - Noise generated from AEF air operations that would takeoff/land at Gila Bend AFAF rather than other regional installations would be the greatest source of noise, but average noise exposure levels would be on an order of magnitude consistent with the noise exposure modeling used to evaluate compatibility of land uses within noise exposure zones at Gila Bend AFAF; similarly, noise exposure from aircraft operations at Luke AFB and other regional installations would not be expected to appreciably change as a result of the change in venue for AEF to Gila Bend AFAF - Operation of ground equipment/vehicles and human activity would also produce noise, but would not be incompatible with existing and ongoing land uses within the potentially affected areas at Gila Bend AFAF and BMGR East	No change to noise levels predicted
Public and Occupational Health and Safety	- No public health or safety impacts, including those related to Executive Order 13045, <i>Protection of Children from Environmental Health and Safety Risks</i> - Occupational health and safety risks associated with proposed expeditionary training would be managed in accordance with applicable policy - Health and safety of combat-deployed troops that participate in the proposed training would potentially benefit from the “train as you fight” experience	- No public health or safety impacts - No change to occupational health and safety at Gila Bend AFAF, Luke AFB, or other regional installations - Troops would continue expeditionary training under conditions that less realistically simulate actual combat conditions
Cultural Resources	- No adverse impact to sites eligible for listing on the National Register of Historic Places (survey of entire Gila Bend AFAF has been completed) or traditional cultural places (history of consultation with Native American communities regarding the BMGR; ongoing consultation with regard to the proposed action) - No impact to cultural resources from use of BMGR East	No impacts to cultural resource predicted

**TABLE 2-1
COMPARISON OF THE ALTERNATIVES**

Resource	Alternative A – Proposed Action	Alternative B – No Action
Socioeconomics	- No measurable impact to the Community of Gila Bend or unincorporated areas of Maricopa County located near Gila Bend AFAF - The direct and induced economic impact of expenditures related to expeditionary training would be broadly distributed across various economic sectors and negligible in context of the greater southern Arizona economy - The social environment at Gila Bend AFAF would vary during active expeditionary training events, but would be consistent with the expected condition on a military installation	No impacts to socioeconomics predicted
Hazardous Materials and Wastes	Existing programs for managing hazardous materials and wastes at Gila Bend AFAF and BMGR East would be expanded to accommodate the use of POLs and some munitions, generation of hazardous waste, human waste, and municipal solid waste associated with the proposed expeditionary training in accordance with federal, state, and local laws, rules, and regulations	Based on the relative scale of the training that can be accomplished at home installations, use of hazardous materials and generation of wastes at home installations rather than at Gila Bend AFAF would occur at somewhat reduced rates than under the proposed action.
Earth Resources	- Localized and short-term ground disturbance would result from the site preparation activities at the proposed expeditionary sites (i.e., training, pouring concrete pads for the AKSSSs, establishing utilities, and filling security barriers with soils, as needed); associated potential for soil erosion, fugitive dust propagation, sedimentation, and exposure to pollutants would be minimized by the slight soil erosion hazard, site characteristics (e.g., topography and layout), and application of erosion control best management practices and spill response protocols - Potential ongoing impacts from use of hazardous materials and movement of equipment and vehicles in expeditionary training, including in convoy training on BMGR East; this impact would be negligible with the application of erosion control best management practices and spill response protocols	No impacts to earth resources predicted

**TABLE 2-1
COMPARISON OF THE ALTERNATIVES**

Resource	Alternative A – Proposed Action	Alternative B – No Action
Water Resources	• Potential temporary minor adverse impacts to surface water from increased sedimentation or released pollutants would be largely confined to the initial site preparation activities and minimized through the application of best management practices and pollution prevention programs; the down gradient Quilotosa Wash could be impacted at minor levels that would be localized and limited in duration • Minimal groundwater would be consumed for dust control • Ongoing impacts to surface waters resulting from expeditionary training activities (i.e., as a result of increased sediment in surface water runoff and soil contamination) would be minimal to non-existent.	• No impacts predicted
Air Quality	• The area of potential effect is in an attainment area for all National Ambient Air Quality Standards for criteria pollutants and all emissions would be well below <i>de minimus</i> levels applied to non-attainment areas • Short-term air emissions (primarily in particulate matter) would result from site preparation activities and would be managed via a Dust Control Plan • Long-term air emissions would be dominated by the shift in aviation operations from Luke AFB and other regional installations (i.e., Davis-Monthan AFB and WAATS) to Gila Bend AFAF, but would also include emissions from ground operations (i.e., transport of troops, use of BMGR convoy routes, and use of munitions in convoy training)	• Sorties associated with expeditionary training would continue to originate at Luke AFB and other regional installations such as Davis-Monthan AFB and WAATS • Although minor in magnitude, the no-action alternative would potentially have a greater negative impact on air quality than the proposed action in context of regional air quality and compliance with the National Ambient Air Quality Standards because Luke AFB is within a serious non-attainment area for PM₁₀ and 8-hour ozone standards

**TABLE 2-1
COMPARISON OF THE ALTERNATIVES**

Resource	Alternative A – Proposed Action	Alternative B – No Action
Biological Resources	- As most of area to be used for expeditionary training has been previously disturbed and cleared of vegetation, there would be negligible impacts to native vegetation and wildlife habitat; the potential for impacts to the Quilotosa Wash community from increased soil erosion would be minimized by the application of best management practices - Common rodents and reptiles may be affected at the Gila Bend AFAF sites and a more diverse assortment of wildlife species may be minimally affected on a short-term and intermittent basis by use of BMGR existing roads for expeditionary convoy training - Most special status species potentially occurring within the area of potential effect would not be affected (lesser long nosed bat, Southern yellow bat, Sonoran pronghorn, and cactus ferruginous pygmy owl); the desert tortoise may be encountered along the proposed BMGR East convoy training routes and the California leaf-nosed bat may forage in portions of the area of potential effect, but no adverse impacts to these species are expected.	No impacts predicted
Environmental Justice	No impacts predicted	No impacts predicted

3.0 AFFECTED ENVIRONMENT

This chapter describes the existing conditions of the area potentially affected by the proposed action. Components of the human and natural environment identified as relevant to this assessment are discussed at a level of detail commensurate with the potential for impact. For most resources, the area of potential effect is limited to the immediate vicinity of the proposed location for billeting and operations shelters on Gila Bend AFAF and existing facilities, infrastructure, and services that would be used to support the two proposed expeditionary training programs at Gila Bend AFAF. Some resources may also be impacted by deployment activities; the change in the AEF flying venue from Luke AFB or other regional installations to Gila Bend AFAF; and the use of certain existing BMGR East roads for convoy training. The inventory of the affected environment was compiled from existing published and unpublished literature, agency consultation, and field reconnaissance.

Components of the human environment (those resources most influenced by man) are discussed first and include airspace and range operations, land use, ground transportation and utilities, noise, public and occupational health and safety, cultural resources, socioeconomic resources, and hazardous materials and waste. Next is a discussion of the existing condition of the natural environment, which includes earth, water, air, and biological resources. Finally, environmental justice is addressed.

3.1 AIRSPACE AND RANGE OPERATIONS

From the perspective of supporting military operations, the BMGR is composed of lands reserved for military purposes and overlying restricted airspace¹ (see Figure 1-1). The four restricted airspace areas overlying the range—R-2301E, R-2301W, R-2304, and R-2305—are designated by the Federal Aviation Administration (FAA) to support the military training missions of the range. BMGR lands are made available for military purposes by virtue of the Military Lands Withdrawal Act of 1999 (P.L. 101-65) for use as (1) an armament and high-hazard testing area; (2) training for aerial gunnery, rocketry, electronic warfare, and tactical maneuvering and air support; and (3) other defense related purposes. The current primary mission of both BMGR East and BMGR West is military aircrew training. The range has been used periodically for testing and some other defense related purposes; but, since its inception in 1941, non-training activities have been secondary to the primary training mission of the BMGR. The primacy of the aircrew training mission at the BMGR is expected to continue into the foreseeable future.

As already noted, BMGR East is subdivided into a number of aviation subranges for the purposes of air combat and associated training (see Figure 1-1). The subranges include an air-to-air range for air combat tactics training and seven air-to-ground weapons ranges for

¹ Restricted airspace is designated to provide defined airspace areas where certain hazardous activities (such as aerial gunnery, artillery firing, or missile firings) can be segregated from non-participating air traffic. Restricted areas are depicted on aeronautical charts to alert the crews of non-participating aircraft as to the locations in which hazardous military activities occur. The FAA delegates control of restricted airspace to the using military agency, which in the case of BMGR East is the 56 FW.

ordnance delivery training. All flying and ordnance delivery operations at BMGR East are regulated by Air Force Instruction (AFI) 13-212 Volume 1, Luke Air Force Base Supplement 1, which is updated as necessary to remain consistent with all safety and environmental protection requirements including the provisions of Biological Opinions that are applicable under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*).

The 56 FW is the managing and scheduling authority for BMGR East. As is the standard procedure at most military training ranges, scheduling priority at BMGR East is assigned to the air installations, as identified in Section 1.2.1, that are classified as regular users of the range in order to support the orderly progress of their ongoing training missions.

One function of the auxiliary airfield is its use for precautionary or emergency recoveries of military aircraft from the BMGR that experience in-flight difficulties. Aircraft that are diverted by bad weather from retuning to their home base also may be recovered at Gila Bend AFAF. Gila Bend AFAF also is used by fixed-wing aircraft for certain flight training activities that generally are related to airfield approach and departure procedures or procedures for handling in-flight emergencies. Typically, training sorties at BMGR East by fixed-wing aircraft currently are generated out of their home air bases and not from Gila Bend AFAF. However, rotary-winged aircraft from the WAATS routinely use the six helipads at the auxiliary airfield as a forward arming and refueling point for training sorties to BMGR East.

Gila Bend AFAF is located in BMGR East but is north of the range restricted airspace (see Figure 1-1). The auxiliary airfield is located within an area of controlled² and uncontrolled³ airspace that extends along the northern extent of the BMGR restricted airspace and that generally is available for use by both military and civil air traffic under the same rules of operation. The air control tower serving Gila Bend AFAF is typically active during daylight hours, but also may be open to support night flying operations at BMGR East. Class D controlled airspace, which is active and under the control of the airfield tower when the tower is in operation, extends laterally from the airfield to a radius of four nautical miles. The Class D airspace extends vertically from the elevation of the airfield, which is at 858 feet above mean sea level (MSL), to 2,500 feet above that elevation, or almost 3,360 feet MSL.

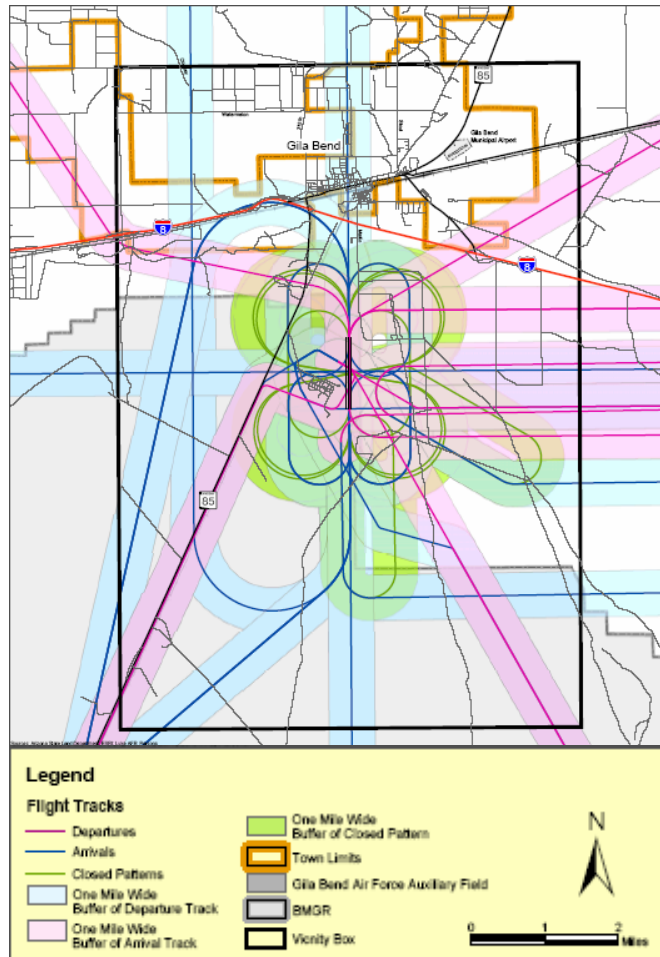
Approach and departure flight tracks to and from Gila Bend AFAF have been established for both fixed-wing and rotary-wing aircraft operations, as shown in the diagram to the right. These flight tracks have been configured in accordance with both Air Force and FAA regulations to promote both flight safety and compatible land use in the vicinity of air installations. The current flight tracks have been assessed through a joint land use study designed to promote land use in the vicinity of the BMGR and Gila Bend AFAF

² Controlled airspace is a generic term that covers the different classifications of airspace (Class A, Class B, Class C, Class D, and Class E airspace) within which air traffic control service is provided to instrument flight rules flights and to visual flight rules flights in accordance with the airspace classification.

³ Class G airspace (uncontrolled) is that portion of airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace. Air traffic control service generally is not available in Class G airspace.

that is compatible with both noise and safety implications of the military flight and weapons training operations at the range (Arizona Department of Commerce 2005). The flight tracks and associated aircraft noise and safety zones identified by the study have been adopted by the Town of Gila Bend as the guidance for land use planning and zoning in the vicinity of Gila Bend AFAF.

The established approach and departure flight tracks to and from Gila Bend AFAF also have been designed to facilitate smooth, integrated traffic flow for and with military aircraft that are entering or leaving the BMGR restricted airspace or other military training airspace in the region as well as with military traffic that is arriving from or returning to their home base. The Gila Bend AFAF flight tracks also are compatible with civil air traffic flow in and through the local region.

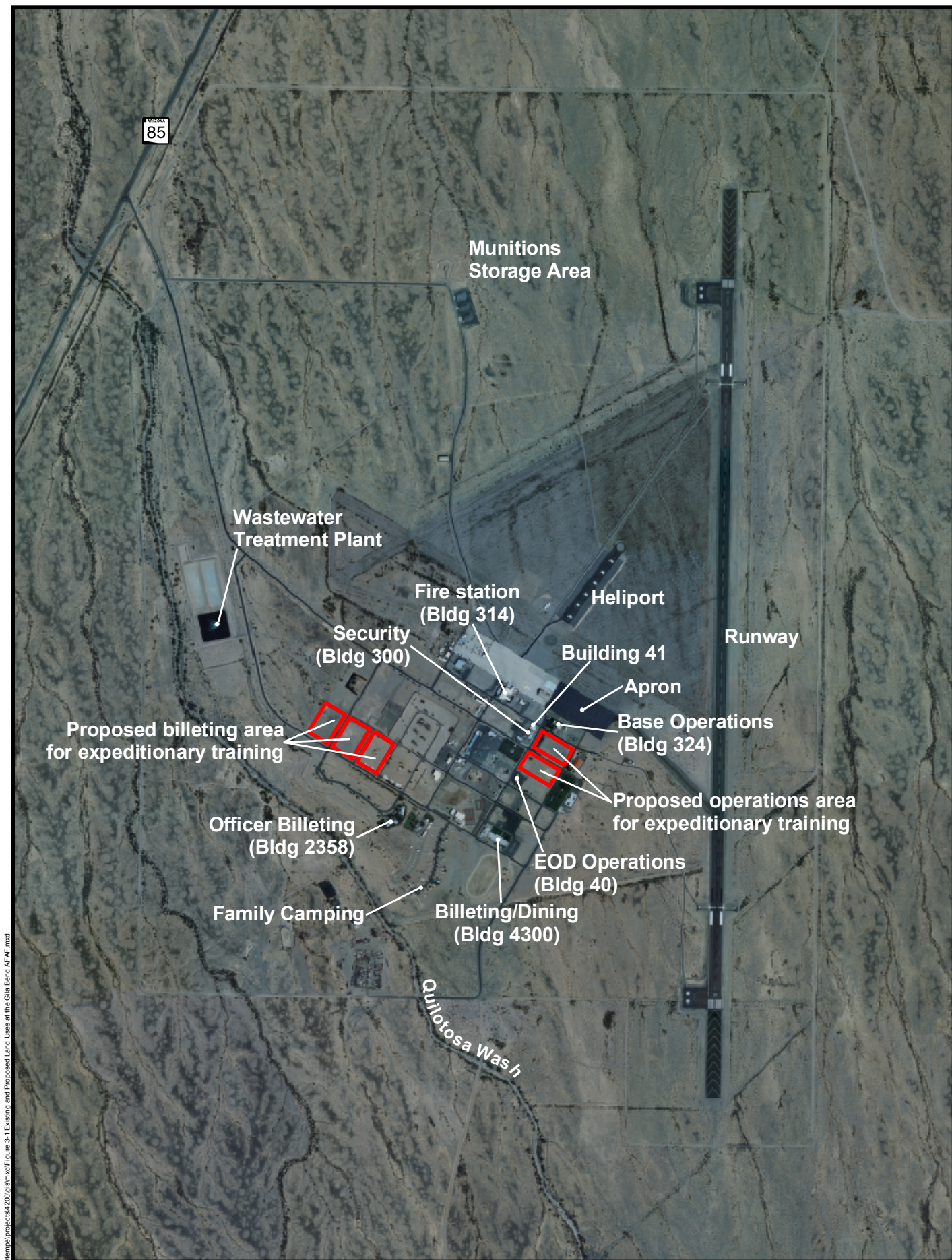


Gila Bend AFAF Existing Flight Tracks
Source: Arizona Department of Commerce 2005

As noted in Section 2.1.1, Gila Bend AFAF has averaged about 34,000 operations annually over the last 10 years with a low year of approximately 22,000 and a high year of approximately 45,000 operations. More than 50,000 sorties are conducted annually at BMGR East.

3.2 LAND USE

Much of the land within Gila Bend AFAF administrative boundaries remains undeveloped. Developed land use at Gila Bend AFAF is dominated by the airfield operation functions (Figure 3-1). These include the 8,500-foot by 150-foot paved runway, six-pad heliport, tie down ramp, air traffic control tower, fuel storage and dispensing facilities, and an aircraft hangar. Supporting facilities are located just west of the central to southern portion of the runway and include fire station/emergency response (Building 314), deployment training facilities (Building 41), various facilities serving training and maintenance functions (e.g., scheduling and dispatch offices, vehicle maintenance shops), EOD operational facility (Building 40), BMGR/Gila Bend AFAF Security (Building 300), base operations (Building 324), and a billeting/dining facility



\\tempe\project\4200\gismx\Figure 3-1 Existing and Proposed Land Uses at the Gila Bend AFAF.mxd

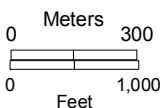


Figure 3-1
Existing and Proposed Land Uses at the Gila Bend AFAF



(Building 4300), and former housing units used to support personnel deployed to the auxiliary field; officer/VIP billeting (Building 2358) and Luke AFB range management office/environmental science management personnel (Building 2360) or to conduct ground work on the BMGR. The MSA is located north of the supporting facilities and west of the northern end of the runway. Recreation facilities include a gymnasium, ball fields, and 41 family camping spaces (former mobile home sites that have been converted to accommodate RVs for use by military personnel and retirees).

Prior to 1994, Gila Bend AFAF was a self-sustaining auxiliary airfield and land uses included residential and various personnel and community support facilities and a base population of about 500. In October 1994, the Air Force closed most of the facility, removed all active military personnel, and transferred the management and maintenance of the facility to a civilian contractor (Luke AFB 2005). Most of the family housing and personnel and community support facilities that were used by military personnel have since been demolished. These were generally located from west of A Street to east of D Street and around Conrad Circle in the western section of the developed area of the installation.

The entire perimeter of the installation is fenced and vehicular access is limited to the main gate entrance located off of State Route 85. Public access to the auxiliary field is restricted to those on official military business and active duty, reserves, and military retirees who are authorized to use the installation's family camping area for recreation. Native Americans may also obtain authorization to enter Gila Bend AFAF in order to gain access to areas of cultural importance or sacred sites (Luke AFB 2000).

As described in Section 3.1, land use in BMGR East is dedicated to and developed to support military training use. The proposed convoy training routes are on existing roads that are outside of the active surface and airspace areas that are reserved for either tactical or manned ranges. These roads are in areas of BMGR East where there is no public access. The Air Force small arms range occupies an approximately 3 acre site located approximately 10 miles southward from the Gila Bend AFAF, west of State Route 85, and east of the White Hills. This facility is used for training security personnel in the use of small arms (U.S. Air Force et al. 2005).

3.3 GROUND TRANSPORTATION AND UTILITIES

3.3.1 Ground Transportation

The area of potential effect for ground transportation includes the network of roads serving Gila Bend AFAF, roads on BMGR East that would be used in expeditionary training, as well as the routes that would be used by ground vehicles and equipment en route between Luke AFB and Gila Bend AFAF for expeditionary training.

State Route 85 traverses west of Gila Bend AFAF and serves as the primary route between Gila Bend and Ajo. Access to Gila Bend AFAF is from State Route 85 via a main gate and an approximately 1.25-mile paved road that extends southeastward to the

main auxiliary airfield facilities. A network of mostly paved roads provides access within the developed portion of the Gila Bend AFAF complex. Major streets on the installation running from the northeast to the southwest include Front, 1st, 2nd, 3rd, and 4th Streets. Major streets that run perpendicular are named by letters of the alphabet, starting with A Street to the northwest and continuing southeast to K Street (see Figure 2-1). An unpaved road defines the perimeter of the installation and is regularly patrolled by security police.

One of the two following routes would be used to traverse the approximately 60 miles from Luke AFB to Gila Bend AFAF:

1. Northern Avenue to State Route 303 (Estrella Parkway) to Interstate 10 to State Route 85.
2. Litchfield Road to Interstate 10 to State Route 85.

Primary roads in the vicinity of Davis Monthan AFB (e.g., Golf Links Road, Aviation Parkway, 22nd Street) to Interstate 10 to Interstate 8 to State Route 85 would be used for transit between Davis-Monthan AFB and Gila Bend AFAF.

Existing (2004) annual average daily traffic estimates for the subject stretches of roads are presented in Table 3-1.

TABLE 3-1 ANNUAL AVERAGE DAILY TRAFFIC ON PUBLIC USE ROUTES THAT MAY BE USED TO ACCESS THE GILA BEND AFAF		
Route and Installation(s) Association	Route Start – End	Annual Average Daily Traffic
Luke AFB		
Northern Avenue	Luke AFB – State Route 303	19,900
Litchfield Road	Luke AFB– Interstate 10	54,000
State Route 303	Northern Avenue – Interstate 10	15,400
Interstate 10	State Route 303 – State Route 85	45,800
Interstate 10	Litchfield Road –State Route 85	54,600
State Route 85	Interstate 10 – Interstate 8	15,000
Davis-Monthan AFB		
Golf Links Road	Davis-Monthan AFB – Aviation Parkway	58,500
Aviation Parkway	Golf Links Road – 22 nd Street	27,700
22 nd Street	Aviation Parkway – Interstate 10	37,500
Intestate 10	22 nd Street – Pinal Air Park	127,200
WAATS/Davis Monthan AFB		
Interstate 10	Pinal Air Park Road – Interstate 8	38,500
Interstate 8	Interstate 10 – Town of Gila Bend	7,400
All Installations	Interstate 8 Business Loop – State Route 85	4,200
	Interstate 8 – Gila Bend AFAF Access Road	1,100

Sources: City of Glendale 2005, City of Goodyear 2004, Arizona Department of Transportation 2005, Pima Association of Governments 2004

State Route 85 is currently being widened to a four-lane road from Interstate 10 to Gila Bend to meet Arizona Department of Transportation projections that traffic will double along this 37-mile portion of State Route 85 in the next 20 years (Arizona Department of Transportation 2004).

The BMGR East road network consists of a network of primarily dirt roads that provide access to target complexes for maintenance and EOD clearance. The four routes that may be affected by proposed use in support of convoy training (see Figure 2-3) currently are used to support existing range operations. The AUX-6 road is used on an irregular schedule throughout the year as a staging area or forward arming and refueling point for helicopter operations and as a field training/bivouac site for Army National Guard or Air Force Security Police units. The road to Manned Range 4 is used to provide access to the range for operation and maintenance as well as range munitions consolidation point (RMCP) 4 and the EOD training range. The road that extends from the south of Gila Bend AFAF towards East Tactical Range (TAC) provides access to the designated, preferred drop site for aerial targets that are used in air-to-air gunnery training on BMGR East. It continues to the south and east to provide access to observation point Charlie near the northwest corner East TAC. The V-shaped road between State Route 85 and the road that extends from the south of Gila Bend AFAF towards East TAC is currently used by combat search and rescue (CSAR) units out of Davis-Monthan AFB for ground training. While State Route 85 is a public use highway, the roads within BMGR East proposed for convoy training are not available for public use because this portion of the range is closed to the public for safety reasons.

3.3.2 Utilities

The utility infrastructure potentially affected by the proposed action is localized to the water, wastewater, stormwater, electrical, natural gas, and communications systems at Gila Bend AFAF.

Water: The existing water supply available at Gila Bend AFAF is acceptable for showers and personal hygiene. However, the water is not used for potable water and bottled drinking water is supplied by a commercial vendor. The annual water use from wells at Gila Bend AFAF is estimated at 68.8 million gallons per year. This includes water that is hauled to the BMGR East ranges to support construction, maintenance, and Manned Ranges. Storage is provided via a 100,000-gallon raw water storage tank; 36,000-gallon water storage tank for reverse osmosis treatment system; and a 36,000-gallon water tower for a secondary delivery system. The water storage tanks are located south of the intersection of 4th Street and E Street (see Figure 2-1). There are two inactive wells on Gila Bend AFAF: Well #1, which was abandoned during construction of the water tower, and Well #2 (Arizona Department of Water Resource Registry Number 55-609891), which has been capped and is no longer in use. Specifications for active wells are provided in Table 3-2 (on next page) (U.S. Air Force 1999).

TABLE 3-2 GILA BEND AFAF ACTIVE WELL DATA		
	Well #3	Well #4
Arizona Department of Water Resource Registry Number	55-609892	55-609893
Construction	16-inch diameter steel casing, total depth = 607 feet	16-inch diameter steel casing, total depth = 603 feet
Submersible Pump Capacity	250 gallons per minute	750-800 gallons per minute
Depth to Water (feet)	302	297
pH (recommended range is 6.5 to 8.5)	8.2	8.4
Temperature (degrees Celsius)	31.5	33

Source: U.S. Air Force 1999

As is common for the Middle Gila Watershed (ADEQ 2002a), groundwater quality in the Gila Bend area is considered to be poor. Reported concentrations of total dissolved solids in groundwater samples in the area range from 937 to 4,940 milligrams per liter (Natural Resources Conservation Service 1997). The Environmental Protection Agency (EPA) National Secondary Drinking Water Standard for total dissolved solids is 500 milligrams per liter. National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply (University of Arizona 2005). Groundwater in the area also contains high concentrations of sodium and boron (Natural Resources Conservation Service 1997).

Sanitary Sewer: The sanitary sewer system at Gila Bend AFAF consists of service laterals, cleanouts, oil/water separators, lift stations, gravity mains, force mains, and access manholes associated with the collection of sanitary sewer from the served buildings on the installation. The collected sanitary wastewater is transferred to a central treatment system that is located to the west of the Gila Bend Access Road where it turns eastward and becomes 1st Street. Much of the system was installed in 1970, although some upgrades to the piping were completed in the 1990s. The treatment system has four lagoons (two lined and two unlined) designed for a capacity of 125,000 gallons per day. However the treatment system must be operated in accordance with its ADEQ aquifer protection permit, which allows for the system to process a maximum of 24,000 gallons per day. (ADEQ aquifer protection permits are issued under Arizona Revised Statute Section 49-241 and rules at 18 Arizona Administrative Code 9, Articles 1-4; aquifer protection permit conditions are set forth in Arizona Revised Statute Sections 49-241 through 49-252, and Arizona Administrative Code R18-9-101 through R18-9-403 [ADEQ 2005a]). It is estimated that up to 10,000 gallons per day is currently being processed at the treatment system (Air Force Civil Engineer Support Agency 2005; Oswald 2005). Sanitary sewer infrastructure is available at the optional locations for the proposed expeditionary operations and billeting tents.

Stormwater: The topography of Gila Bend AFAF is relatively flat with elevations ranging from approximately 800 to 870 feet MSL with a slope from south to north. Stormwater runoff at Gila Bend AFAF is not channelized other than as engineered in the

configuration of the runway, roadway, and parking pavements. (See also Section 3.10, Water Resources).

Electrical: An overhead power distribution line connects Gila Bend AFAF to Arizona Public Service Company's Gila Bend to Ajo 69-kilovolt transmission line, which parallels State Route 85. Overhead service lines diverge from this point of connection (at the water plant) and generally parallel the road infrastructure to serve Gila Bend AFAF. Electrical power is available to the lots proposed as optional locations for expeditionary operations and billeting AKSSS tents and associated activities.

Natural Gas: Propane gas is supplied to Gila Bend AFAF via three 1,000-gallon propane tanks owned by the propane supplier, Amerigas Inc. Propane gas is delivered to the lodge (Building 4300) and to the Fire Department (Building 314).

Communication: Quest provides telephone service via overhead lines that parallel the electrical lines (Luke AFB 2000a).

3.4 NOISE

Noise is often defined as unwanted sound. Among the main characteristics of sound or noise are sound intensity, sound frequency, and sound duration. Sound intensity is typically assessed in the logarithmic scale called decibels (dB). A sound level of 0 dB approximates the threshold of human hearing. Depending on level, frequency contents, and time characteristics of sound, unwanted sound can interfere with speech communication, disturb sleep, and cause annoyance. Long exposure to noise levels exceeding 75 dB can result in hearing loss and other health-related problems (Luke AFB 1997a).

An analysis of noise exposure from current operations at Gila Bend AFAF was prepared in 2004. The NOISEMAP computer model, one of two EPA approved models, was used to delineate noise exposure levels. In 1974, EPA designated the noise descriptor "Ldn," or day-night average sound level as the standard measurement for noise impacts. Ldn refers to the average sound level exposure, measured in decibels, over a 24-hour period, with a 10-decibel penalty added to sound levels for operations occurring during the hours of 10 p.m. to 7 a.m. This



*Gila Bend AFAF Existing Noise Contours
Source: Arizona Department of Commerce 2005*

penalty is applied due to the increased annoyance created by noise events that occur during this time (Arizona Department of Commerce 2005).

Noise exposure developed from this modeling method develops contours depicting areas exposed to noise in the following noise zones: 65 to 69 Ldn, 70 to 74 Ldn, 75 to 80 Ldn, and greater than 80 Ldn, as shown in the graphic on the preceding page. The 65 to 69 Ldn exposure zone extends into some operational facilities in the eastern portion of the developed area of Gila Bend AFAF. This land use is considered compatible within this noise zone. These existing noise contours are based upon use of the F-16 and A-10 aircraft during a routine active day when operations are occurring at Gila Bend AFAF (Arizona Department of Commerce 2005). Additional assessment of compatibility with local planning and potential future noise exposure from successor aircraft are addressed in Section 4.15, Cumulative Impacts and Section 4.16, Compatibility with Land Use Plans, Policies, and Controls.

3.5 PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

3.5.1 Safety Requirements and Standards

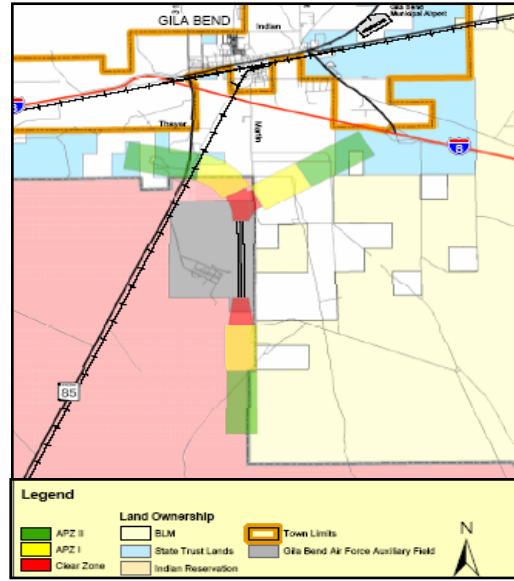
With all of its operations, the Air Force complies with applicable U.S. Department of Labor, Occupational Safety and Health Administration regulations as well as Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees*, and Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*. In addition, Air Force Occupational Safety and Health Standards provide further detailed direction on all areas of operations occurring on Gila Bend AFAF and BMGR East. *Department of Defense (DoD) Instruction 2000.16, DoD Anti-terrorism Standards*, is the current policy directive for the DoD security program that was developed to protect service members, civilian employees, family members, facilities and equipment from terrorist attacks; and *Unified Facilities Criteria (UFC) 4-010-01*, dated 8 October 2003, provides guidance on the minimum antiterrorism standards for buildings. On installations such as Gila Bend AFAF (where there is a controlled perimeter), the guidance generally calls for a standoff or separation distance from parking and roadways and trash containers of 25 meters (82 feet) for billeting facilities and primary gathering structures (facilities routinely occupied by 50 or more personnel) and 10 meters (33 feet) from inhabited structures (facilities routinely occupied by more than 11 personnel at a density greater than one person per 40 gross square meters [430 gross square feet]).

3.5.2 Clear Zones and Accident Potential Zones

An analysis of aircraft accidents worldwide within 10 nautical miles of a military airfield for the period of 1968 to 1972 led to defining areas of high accident potential at DoD airfields. Three zones define the areas of relative potential for an aircraft accident: the Clear Zone, Accident Potential Zone I (APZ I), and Accident Potential Zone II (APZ II). The Clear Zone lies immediately beyond the runway and has the highest probability for accidents, severely limiting acceptable land uses. APZ I, the area immediately beyond the Clear Zone has a measurable potential for accidents less than that of the Clear Zone,

but more than APZ II. APZ II, the area beyond APZ I, has a measurable potential for accidents. Some land use control is essential within the APZs. The DoD recommendation for the APZs is to limit the number of people exposed to noise and safety hazards through appropriate land use planning (Arizona Department of Commerce 2005)

As shown in the graphic to the right, the Clear Zones and APZs for Gila Bend AFAF are located at either end of the primary runway along the extended runway centerline. These zones have been defined to reflect the unique operations at Gila Bend AFAF. The two departure paths from the airfield involve either a right hand or left hand turn for departures to the north (Arizona Department of Commerce 2005).



*Gila Bend AFAF Accident Potential Zones
Source: Arizona Department of Commerce 2005*

3.5.3 Emergency Response

A system and procedures for responding to emergencies from fires, explosions, hazardous material releases, and aircraft crashes are outlined in the emergency response contingency plan for Gila Bend AFAF. The foundation of the response plan is that the protection of lives and property takes precedence over other operations. Emphasis is placed on requirements to achieve minimum response time and employ the fire department and/or emergency response team with maximum skills. The initial response element, typically consisting of Gila Bend AFAF Security Police and Fire Department personnel, deploys immediately in response to emergencies to gain initial command and control, save lives, and suppress and control hazards. The On-Scene Commander (initially, the Senior Fire Official) is charged with directing the response until the emergency is over or until relieved by another qualified individual or government official. The larger Gila Bend AFAF Disaster Response Force includes all local resources needed to support the response effort including elements of range operations, civil engineering, logistics, and on-site EOD personnel (as available and needed). Emergency responders at Gila Bend AFAF are required to receive annual training commensurate with their responsibilities in conventional munitions, hazardous materials, off-base deployment, mass casualties, and national disaster response (floods). The Air Force has an agreement for mutual aid in fire protection with the Town of Gila Bend Fire Department that secures to each the benefits of mutual aid in fire prevention, fire fighting, and the protection of life and property from fire (Luke AFB 2000).

3.6 CULTURAL RESOURCES

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can be divided into three major categories: archaeological resources (prehistoric and historic), architectural resources, and traditional cultural places.

Archaeological resources are locations where human activity measurably altered the earth or left deposits of physical remains (e.g. stone flakes, arrowheads, or bottles). Archaeological resources may be either prehistoric or historic and can include campsites, roads, fences, trails, dumps, battlegrounds, mines, and a variety of other features.

Architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance.

Traditional cultural places can include archaeological resources, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans and other groups consider essential for the continuance of traditional cultures. In the project area, traditional cultural places are usually associated with Native American groups.

Under the National Historic Preservation Act (NHPA) as amended, only significant historic cultural resources, known or unknown, warrant consideration with regard to adverse impacts from a proposed action. Archaeological and architectural resources generally must be more than 50 years old to be considered for protection under the NHPA. However, more recent structures, such as Cold War era military buildings, may warrant protection if they are “exceptionally significant.” To be considered significant, archaeological or architectural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion in the National Register of Historic Places (NRHP). These criteria include association with an important event, association with a famous person, embodiment of the characteristics of an important period in history, or the ability to contribute to scientific research. Resources must also possess integrity (i.e., its important historic features must be present and recognizable).

Traditional cultural places can be evaluated for NRHP eligibility as well. However, even if a traditional resource is determined to be not eligible for the NRHP, it may still be significant to a particular community or Native American tribe and protected under other laws and regulations discussed below. The significance of a traditional resource is usually determined by consulting with the appropriate group.

Several other federal laws and regulations have been established to manage cultural resources, including the *Archaeological and Historic Resources Preservation Act* (1974), the *Archaeological Resources Protection Act* (1979), and the *Native American Graves Protection and Repatriation Act* (NAGPRA) (1990). In addition, coordination with federally recognized Native American tribes must occur in accordance with the *American*

Indian Religious Freedom Act (1978); Executive Order 13007, *Indian Sacred Sites*; Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; and the DoD requirements relating to the *Annotated American Indian and Alaska Native Policy* (1999), which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. This policy requires an assessment through consultation of the effect of proposed DoD actions that could significantly affect tribal resources, tribal rights, and Indian lands before decisions are made by the respective services.

The area of potential effect for the project consists of areas of ground disturbance including construction and development of the expeditionary operations and billeting areas. Existing roads within the Gila Bend AFAF would be used to access these training areas and certain existing roads within BMGR-East (see Figure 2-3) would be used for convoy or other types of expeditionary training activities. These existing roads would not be improved or changed as a result of this project; therefore the roads are not included in the area of potential effect for cultural resources.

3.6.1 Cultural History

The Papaguería is a unique geographic area in southwestern Arizona and northwestern Sonora, Mexico, that extends from south of the Gila River on the north to the Gulf of California on the south, and from the Colorado River on the west to Three Points (west of Tucson) on the east. This region is subdivided into the eastern and western Papaguería based on cultural and environmental factors: the boundary between two Piman-speaking O’odham groups, and the juncture of two biotic communities coupled with a marked change in annual rainfall. The boundary between these areas is located near and roughly parallels the eastern boundary of the BMGR East placing the entire BMGR, including Gila Bend AFAF, within the western Papaguería. This term is used extensively in archaeological literature, including this report, to identify a geographic region, an environment, and a cultural area.

The western Papaguería includes the region bounded by the Colorado River to the west, the Gila River to the north, the Papago Indian Reservation (home to the Tohono O’odham Nation today) to the east, and Puerto Peñasco, Sonora, to the south. The Papaguería was the traditional territory of the Hia C-ed O’odham (formerly known as the Sand Papago Indians) and Tohono O’odham (formerly known as the Papago Indians). Formerly, the Hia C-ed O’odham inhabited the area, although other cultural groups such as the Quechan, Cocopah, Yavapai, Apache, Maricopa, and the Tohono O’odham used portions of the region as well. Two tribes now located some distance from the BMGR—the Hopi Tribe and the Pueblo of Zuni—also have made claims of affiliation based on their oral histories and their association with the archaeological culture called Hohokam, which is well represented on the BMGR. The cultural history of the Western Papaguería can be divided into seven periods as characterized in Table 3-3 (begins on next page).

TABLE 3-3
WESTERN PAPAGUERÍA CULTURAL HISTORY

Period	<i>Summary of Characteristics</i>
<i>Paleo-Indian Period</i> circa 10,000-8,000 B.C.	Characterized by reliance on native plants and animals and mobile settlement systems. Refers to the initial pre-formative period occupation (although some consider the Malpais archaeological complex to be an even earlier occupation). Represented by the San Dieguito and Clovis archaeological complexes, which are each characterized by a distinctive tool kit. Associated with the hunting of now extinct big game species, including mammoths.
Archaic Period 8,000 B.C. – A.D. 200	Represented by two archaeological complexes (Amargosa and Cochise) and chronologically subdivided into Early, Middle and Late periods. Until the very end of the period, Archaic populations collected a broad spectrum of native plant and animal foods with seasonal movements. Agricultural villages were established during the end of this period in areas east of the BMGR, but it is not known whether this change in subsistence strategies also occurred in the western Papaguería.
Formative Period circa A.D. 200-1500	The Hohokam (centered in the Gila-Salt Basin to the east) and Patayan (along the lower Colorado River) cultural traditions are represented in the western Papaguería during this period. Trincheras was centered to the southeast in northern Sonora, and may be represented on the BMGR as well. The Formative Period is recognized principally on the basis of pottery styles that mirror better-known changes through time in ceramic manufacture in the Gila-Salt and Tucson basins. The question of what subsistence-settlement systems were adopted by Hohokam occupants of the western Papaguería is of considerable interest, but more excavation data are needed. The Patayan cultural tradition is not well understood; the tradition is divided into three phases, defined principally on the basis of changes in the Lower Colorado Buff Ware pottery (which is found throughout the western Papaguería). It is unclear whether the occurrence of this pottery implies the presence of Patayan groups in the western Papaguería, or reflects contact and exchange between groups. Similarly, Trincheras purple-on-red pottery is present on some sites within the western Papaguería. The Trincheras culture is best known in the Altar Valley. Rather than viewing formative period sites as representing one or the other of the riverine cultures, recent researchers have focused on the inhabitants of the western Papaguería and their interactions with people in that region and beyond.

TABLE 3-3
WESTERN PAPAGUERÍA CULTURAL HISTORY

Period	<i>Summary of Characteristics</i>
Early Historical Period A.D. 1540-1848	Spaniards used the western Papaguería principally as a travel corridor, following two primary routes—El Camino del Diablo that runs between Caborca and Yuma, and a north-south route that connected settlements in Mexico with the Gila Bend area. The Spanish missionary Father Eusebio Kino traveled through the area in the late 1600s, and early 1700s noting that Tohono O’odham and Hia C-ed O’odham people occupied the western Papaguería. Today, O’odham groups claim affinity with the prehistoric Hohokam. The Hopi also claim affinity with the prehistoric Hohokam. The Zuni have similar histories of migrations from southern Arizona. The Cocopah, Quechan, Halchidoma, Cohuana, Halyikwamai, Kaveltcadom, Maricopa, and Mojave, occupied various areas along the Lower Colorado and Gila rivers, where they practiced floodwater farming. Internecine warfare led to frequent territorial shifts among these groups. The Yavapai ranged through a vast territory north of the Gila River and probably ventured south of the Gila River into the western Papaguería at times. Apaches made brief forays to engage in raiding.
Late Historical Period A.D. 1848-1941	This period is characterized by intensifying contact among Native American groups and Euro-Americans. The United States acquired the territory to the north of the Gila River (resulting from the Mexican-American War in 1848) and through the area to the south of the Gila River (the Gadsden Purchase of 1853-1854), which was home to the Hia C-ed and Tohono O’odham. U.S. troops first traveled along the Gila River during the Mexican-American War. The “Forty-Niners” soon followed on their way to the newly discovered gold fields of California. El Camino del Diablo served as an alternate route for some Forty-Niners and, subsequently, various adventurers and scientists. Just the Cocopah and Quechan remained in residence along the lower Colorado River below the confluence with the Gila River, and no native groups resided on the lower Gila River. Remnants of several Yuman speaking people joined the Akimel O’odham (Pima) along the middle Gila River, where they became known as the Maricopa. The transcontinental Southern Pacific Railroad was constructed and copper mining at the New Cornelia Mine near Ajo stimulated construction of a spur line to connect with the Southern Pacific at Gila Bend. Gold was mined at the Fortuna Mine in BMGR-West, and evidence for smaller mining and prospecting endeavors is reported throughout the region. From the late 1800s to the early 1900s, ranching and homesteading also were pursued in the area that was to become the BMGR.

TABLE 3-3
WESTERN PAPAGUERÍA CULTURAL HISTORY

Period	<i>Summary of Characteristics</i>
World War II Period A.D. 1941 - 1945	The BMGR of today is the result of a series of land withdrawals that were initiated during World War II. In May 1941, when Lt. Col. Ennis Whitehead first surveyed the land west of Phoenix for Luke Field, he also noted that public lands south and west of Gila Bend were ideal for a gunnery range, and Luke student pilots began training on the range in September 1941. During World War II, pilots from both Luke Field and Williams Field used BMGR-East for gunnery training, and pilots from the Yuma Army Air Base, which was established between 1941 and 1943, trained on BMGR-West. After World War II when Luke Field was closed from 1946-1951, Williams Field personnel managed BMGR-East. The Yuma Army Airfield became Vincent AFB in 1956 and then in 1959, Marine Corps Air Station Yuma.
Cold War Period A.D. 1946-1989	The Cold War period is defined as extending from the establishment of the “Iron Curtain” in Europe in 1946 to the fall of the Berlin Wall in 1989. Since 1951, the BMGR has hosted air-to-air and air-to-ground bombing and gunnery training on both manned and tactical ranges as part of the Cold War program of military preparedness that remains in place today.

Source: Adapted from U.S. Air Force et al. 2005

3.6.2 Native American Consultation

The 56th Range Management Office (56 RMO) has consulted intensively with Native American communities to address traditional cultural concerns and identify traditional cultural places that may warrant special management. Twenty-three of the 26 Native American communities consulted with indicated they had some level of interest in the cultural resources of the BMGR and the 56 RMO regularly consults with 15 tribes and groups about routine management activities on BMGR East (U.S. Air Force et al. 2005). With support from the 56 RMO, four tribes have completed studies of traditional cultural values associated with places on the BMGR, and a fifth study is underway.

All of the consulted groups have concerns about treatment of any human remains that may be present in archaeological sites on the BMGR. Some communities consider the aboriginal archaeological sites on the BMGR as having significant traditional cultural values beyond the archaeological information such sites may encapsulate. Some types of sites, such as petroglyphs, pictographs, intaglios, rock piles and trails affiliated with places that are identified as shrines or offering places, as well as archaeological sites associated with farming or trading of marine shell, have special traditional cultural values. Some places, such as the Gila Mountains, are considered significant because of associations with tribal origin accounts or other oral traditions. In addition, springs, other sources of water, and plants or mineral deposits used for ceremonial, medicinal, and subsistence uses are considered traditionally important. Many traditional cultural values are not focused on individual sites or places, but instead are more general concerns with entire landscapes. The 56 RMO will continue to consult with interested Native American communities on an ongoing basis.

3.6.3 Cultural Resources Inventory

The cultural resources inventory was derived from the results of an intensive archaeological survey and an assessment of World War II and Cold War buildings and structures. The latter addressed buildings and structures built during World War II and the Cold War at the Gila Bend AFAF (Keane and others 1997, 1998). In 2002, Statistical Research, Inc. conducted a survey of the entire 2,322-acre Gila Bend AFAF (Ahmet and Doolittle 2005).

The 56 RMO initiated review of this proposed action with the State Historic Preservation Officer (SHPO) and tribes that attach cultural importance to places on BMGR East, pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800, *Protection of Historic Properties*, in letters dated 7 October 2005 (see sample letter in Chapter 6). In some cases, this consultation process identifies historic properties that might not have been recognized during the archaeological survey (such as traditional cultural places) may be identified. The outcome of this consultation process is addressed in Section 4.6.1.

3.6.4 Recorded Cultural Resources

Eleven archaeological sites and 187 isolates have been recorded to date within the Gila Bend AFAF. One of the 11 was a previously recorded site designated AZ Z:2:57 (ASM). This site is a scatter of potsherds containing both Hohokam and Patayan ceramics. Nine of the remaining sites are prehistoric artifact scatters (six with features) and one is a historical-period trash scatter dating to the World War II era. The 56th Range Management Office determined that all nine of the prehistoric sites were eligible for inclusion on the NRHP; the historical site was found not to be eligible. Two isolated thermal features also were determined eligible because they may contain buried deposits. HQ AETC/CEV reviewed and approved these findings, and the Arizona SHPO concurred with these determinations.

There are 15 World War II facilities and 210 Cold War facilities recorded at the Gila Bend AFAF; none was determined eligible for NRHP listing in consultation between the 56 RMO and the SHPO. Keane *et al.* (1998) recommended reevaluation of seven Cold War era buildings or structures as they approach 50 years old (Ahmet and Doolittle 2005).

None of the recorded cultural resources are located within the proposed expeditionary operations and billeting areas. The closest cultural resource is located on the opposite side of the north-south runway and approximately 0.5 miles from the proposed operations area.

To date, no traditional cultural places have been identified at the Gila Bend AFAF. However, on-going consultation between the 56 RMO and local Native American tribes continues and ethnographic studies are planned to expedite the location of traditional

cultural places. Additionally, no human remains covered by NAGPRA have been found on the BMGR since the Act took effect in 1990.

3.7 SOCIOECONOMIC RESOURCES

The area of potential effect for the social and economic environment is largely that of the population of Gila Bend AFAF. To a lesser extent, the community of Gila Bend, and unincorporated portions of Maricopa County near the airfield could also potentially be affected (represented by census tract 7233.02 which extends north of the BMGR to the Gila River). The closest Native American Reservation is the Gila Bend District, also known as the San Lucy District of the Tohono O'odham Indian Reservation, which encompasses approximately 500 acres north of the town of Gila Bend. The area of potential socioeconomic affect is not expected to extend to this Native American reservation and community.

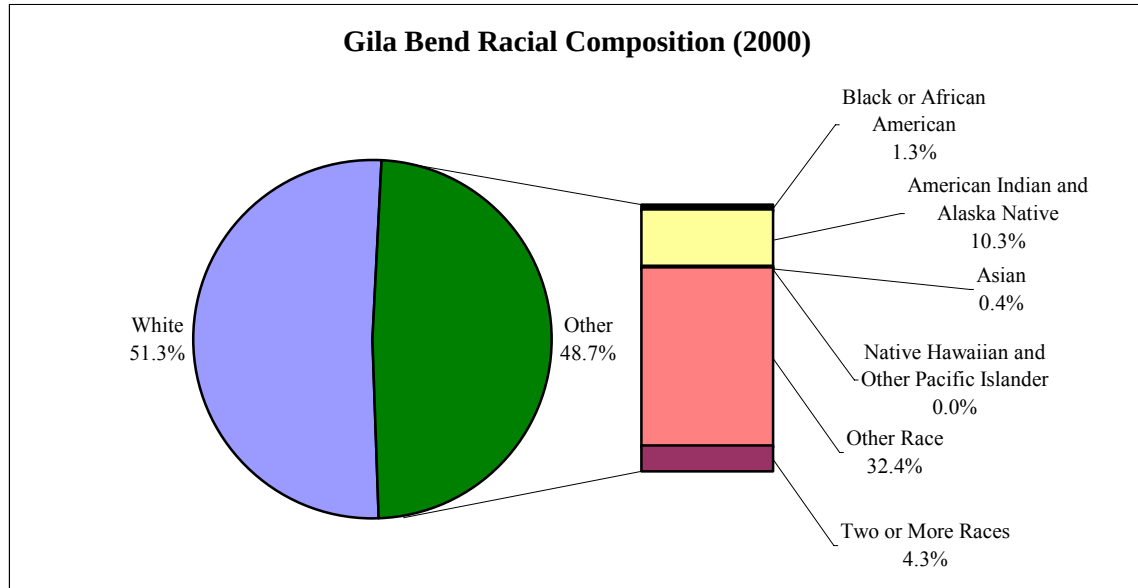
The on-installation population consists of:

- 135 civilian contract employees
- 6 civilian government employees
- Deployed active duty military personnel (approximately 20 deployments annually involving between 30 and 150 military personnel)
- Recreating military retirees, reservists, and active duty personnel using the 41 family camp spaces, which are generally full from October through April (Sizemore 2005)
- Deployed civilian government employees (e.g., range and resources specialist conducting field work on the BMGR, highly variable frequency and low numbers of personnel)

The social structure of the on-installation population is centered on the military mission of Gila Bend AFAF and BMGR. A primarily civilian workplace force functions in a manner that aligns with the military social environment. The social environment is also influenced by the rural nature of the installation location in the daily interactions between the on-installation and off-installation environments (e.g., travel to/from the installation, interaction with service and retail providers, etc.).

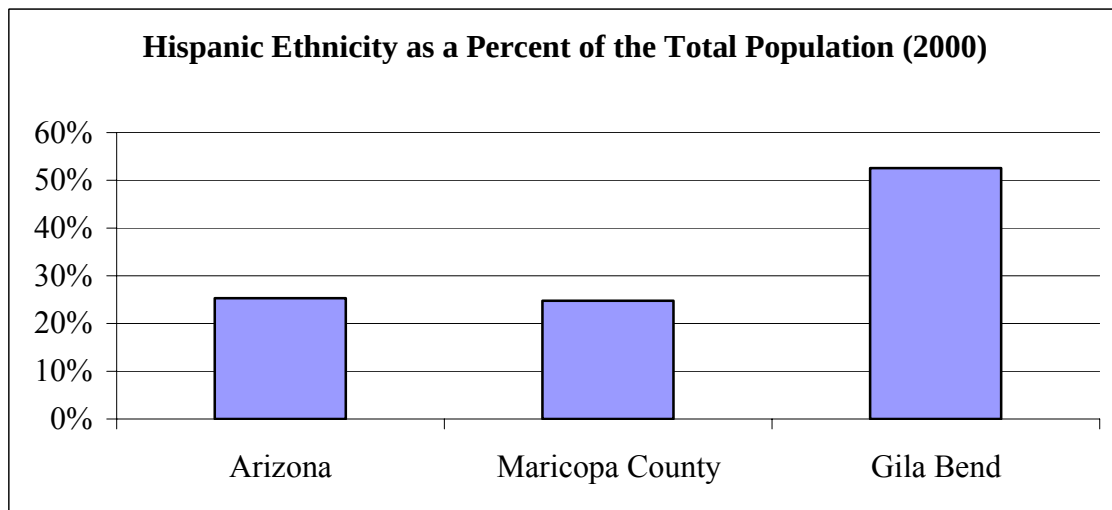
The community of Gila Bend had a population of 1,980 per the 2000 Census. The population is growing, but at a much slower rate than Maricopa County and Arizona. Whereas between 1970 and 2000, Arizona's population grew by 190 percent and Maricopa County's population increased by 217 percent, Gila Bend's population grew by 10 percent (U.S. Census Bureau 1970, 1990, and 2000; GeoLytics, Inc. 1999). This trend is expected to change; population projections estimate the population of Gila Bend will be 2,800 by 2010; 6,000 by 2020; and 17,800 by 2030 (Maricopa Association of Governments 2003). The population in Gila Bend is young, with a median age of 29 years old, as compared to Maricopa County's median age of 33 and Arizona's median age of 34 (U.S. Census Bureau 2000).

As shown in the following graphic, the majority of the population in the Town of Gila Bend is white (51 percent); 32 percent fall in some other race category provided for those who do not identify themselves in one of the five racial categories, and 10 percent are American Indian/Alaska Native (U.S. Census Bureau 2000).



Source: U.S. Census Bureau 2000

As shown in the graphic that follows, the population of Gila Bend is largely Hispanic (more than 52 percent of the total population) as compared to 25 percent in Arizona and Maricopa County. (Hispanic origin statistics represent all persons who identify themselves as Mexican, Puerto Rican, Cuban, Central American, or of other Hispanic origin or descent. These data reflect ethnicity, not race.)



Source: U.S. Census Bureau 2000

The majority of Gila Bend residents (55 percent) speak a language other than English at home, and a relatively high percentage (20 percent) speak English less than very well. Educational attainment is low; 55 percent of the Gila Bend population has attained a high school education (as compared to 81 percent in Arizona and 83 percent in Maricopa County) (U.S. Census Bureau 2000).

The largest employment sector in Gila Bend in 2000 was the *arts, entertainment, recreation, accommodation, and food services* sector, which represented 16.9 percent of the labor force. This employment sector includes many services used by tourists and those visiting the natural amenities of the region. In comparison, the largest employment sector in Maricopa County and Arizona in 2000 was the *education, health and social services* sector, which represented 16.1 percent and 18.0 percent of the labor force, respectively. The sector of *agriculture, forestry, fisheries, and mining* made up a much larger proportion of the labor force in Gila Bend compared to the county and state. In Gila Bend, 8.7 percent of the labor force was employed in this sector in 2000 compared to 0.6 percent of the county's labor force and 1.5 percent of the state's. After the *arts, entertainment, recreation, accommodation, and food service* sector, the next top three employment sectors in Gila Bend in 2000 were *retail trade* (15.5 percent of the labor force), *education, health and social services* (14.4 percent of the labor force), and *public administration* (11.8 percent of the labor force) (U.S. Census Bureau 2000).

As shown in Table 3-4, the median family income rates for Gila Bend and Census Tract 7233.02 are lower and the unemployment rates are higher than those of Maricopa County and Arizona. Poverty rates are high at nearly 25 percent of the population—which is more than double the rate for Maricopa County (8.0 percent) and Arizona (9.9 percent). Additional data on minority and low-income populations is provided in Section 3.13.

TABLE 3-4 MEDIAN FAMILY INCOME AND UNEMPLOYMENT RATES		
	<i>Median Family Income in 1999</i>	<i>Unemployment Rate</i>
State of Arizona	\$46,723	5.6%
Maricopa County	\$51,827	4.7%
Gila Bend	\$30,403	7.7%
Census Tract 7233.02 (North of BMGR East)	\$36,890	N/A

Source: U.S. Census Bureau 2000

3.8 HAZARDOUS MATERIALS AND WASTES

Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act; the Occupational Health and Safety Act; and the Emergency Planning and Community Right-to-Know Act. Hazardous waste is defined in the Resource Conservation and Recovery Act as “any solid, liquid, contained gaseous or semi-solid waste, or any combination of wastes, that could or do pose a substantial hazard to human health or the environment.” Waste may be classified as hazardous because of its toxicity, reactivity, ignitibility, or corrosivity. In addition, certain types of waste are “listed” or identified as hazardous in 40 CFR 263. Solid wastes

are defined in the Resource Conservation and Recovery Act as “Any garbage, refuse, sludge..., and any other discarded material, including: solid, liquid, semisolid or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to [National Pollutant Discharge Elimination System] permits...or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954...” At Gila Bend AFAF and BMGR East, hazardous material and waste management for Gila Bend AFAF is the responsibility of the Environmental Flight at Luke AFB. ADEQ provides the primary oversight and enforcement of hazardous materials and waste regulations, with assistance from federal regulating agencies such as the EPA.

Within the area of potential effect, the use of some materials that, under certain circumstances, can be hazardous to human health or the environment is required. These include aircraft, automotive, and generator POLs, paints, and cleaning solvents, as well as pesticides, and herbicides. The level of threats posed to human health and the environment varies with type of material and activity and is minimized by numerous state and federal laws that regulate the use of hazardous materials and the storage, transportation, handling, and disposal of hazardous materials and wastes. In addition, Air Force policies aim to prevent pollution, meet or exceed all regulatory requirements, minimize or eliminate the use of hazardous materials, and prevent the release of hazardous materials and waste into the environment. Air Force personnel training also addresses how to prevent, control, manage, and respond to hazardous material/waste releases. Low concentrations of hazardous wastes may be processed at the wastewater treatment system at Gila Bend AFAF. As stated in Section 3.3.2, the wastewater treatment system is subject to existing ADEQ aquifer protection permit conditions and is monitored in accordance with applicable regulations.

Three active underground storage tanks (UST) are used for fuel storage at Gila Bend AFAF. These include a 4,000-gallon diesel UST located northwest of Building 326 and west of one of the optional locations for expeditionary operation facilities, and two 10,000 gallon USTs storing JP-8 aviation fuel located east of the intersection of Second Street and K Street (Thomas 2005). These tanks meet all current construction, corrosion protection, release detection, and spill/overflow prevention requirements (U.S. Air Force et al. 2005). A 500-gallon UST was once located within the northern portion of the westernmost optional location for the proposed tent city; a clean closure was completed at this former UST site in 1992 (Thomas 2005).

Municipal solid wastes are policed and contained daily and are collected and transported off Gila Bend AFAF for disposal by a commercial contractor in accordance with all applicable rules and regulations.

Potential contamination from past activities at the installation is addressed through the Air Force’s installation restoration program, which addresses identification, investigation, and remediation of past waste releases. A plumbing/metal shop and a former fire training

area at Gila Bend AFAF were identified and investigated under this program in 1995; soil sampling and analysis determined that no further action was necessary for these sites in 1997 (U.S. Air Force et al. 2005). Both of these sites are located to the north of Front Street and west of C Street, outside the area of potential effect. Additional investigations identified nine Areas of Concern on Gila Bend AFAF; seven of these are located south of the developed area of Gila Bend AFAF and two are east of the northern end of the runway. A no further action determination has been made for six of these and investigations continue on the three remaining sites, all of which are located south of the developed area of Gila Bend AFAF, well outside the area of potential effect (Thomas 2005).

3.9 EARTH RESOURCES

Earth resources are defined as the topography, geology, and soils of a given area. Long-term geological, erosional, and depositional processes typically influence the topographic relief of an area. The geology of an area includes bedrock materials, mineral deposits, and fossil remains. The principal geologic factors influencing stability of structures are soil stability and seismic properties. Soil, in general, refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support structures and facilities. Relative to development, soils typically are described in terms of their type, slope, physical characteristics, and relative compatibility or limitations with regard to particular construction activities and types of land use.

3.9.1 Geology and Topography

The BMGR is located in the Sonoran Desert portion of the Basin and Range Physiographic Province of Arizona. This province is characterized by steep, rocky, discontinuous subparallel mountain ranges that trend from northwest to southeast with intervening broad, gently sloping to nearly flat, deep alluvial filled valleys or basins. Alluvial clays, silts, sands, and gravels underlie this area.

The mountain ranges on the BMGR have been formed of Precambrian to Tertiary-aged igneous, metamorphic, and sedimentary rocks. Valley fill materials consist of Quaternary to Holocene unconsolidated to moderately consolidated silts, clays, sands, and gravel (Arizona Geological Survey 1988). Elevations range from about 200 feet in valley bottoms to nearly 4,100 feet in the Sand Tank Mountains. Relief on the BMGR between valley bottoms and mountain peaks is typically between 1,000 and 2,000 feet.

The Gila Bend AFAF lies within the eastern Gila Bend Plain and is bound by the Sand Tank Mountains to the east, the Sauceda Valley and Mountains to the south, and the Gila Bend Plain extending to the west and northwest. The Gila Bend AFAF is situated on alluvial fill of the Gila Bend Plain. The thickness of the alluvium is about 2,000 to 3,000 feet in the vicinity (Luke AFB 1997b). Rocks located in the area include gravel- to boulder-sized fragments of volcanic breccia, basalt, rhyolite, andesite, gneiss, and quartz. These rocks are embedded in the silty-sand matrix that is characteristic of the Gila Bend

Plain. The elevation of the Gila Bend AFAF is about 850 feet MSL and slope in the vicinity is from south to north.

Seismicity

The Gila Bend AFAF is within the Southern Basin and Range seismic source zone, which extends from Mexico into southern California and includes most of southwestern and central Arizona. The BMGR is in a tectonically stable area with low levels of seismic activity and few active faults. The most prevalent seismic activity in the region is generally along the Colorado River area and from a northwest to southeast trending zone through Yuma that includes the San Andreas and related faults. Known active faults in the region include the Algodones Fault near Yuma and the Sand Tank Fault approximately 6 miles southeast of the Town of Gila Bend (USGS 2000).

Land Subsidence and Earth Fissures

Subsidence and earth fissures are geological events that are accelerated by the long-term extraction of groundwater. Areas with land subsidence may be subject to accelerated erosion along drainages, increased flood hazards, and increased potential for damage to manmade facilities. Earth fissures may form as a result of land subsidence. Fissures generally form at the margins of subsiding basins over buried ridges or irregular bedrock surfaces. Although some portions of Maricopa County have experienced subsidence, there are no known subsidence areas or earth fissures in the vicinity of the Gila Bend AFAF (Gelt 1992).

3.9.2 Soils

The Sonoran Desert evolved after millions of years of volcanic eruption, uplift, mountain building, and faulting. A variety of soils, derived dominantly from mixed rocks, were formed in the resulting alluvium fans and terraces. These soils range from fine-grained sands and silts on the valley floors to very gravelly soils in the mountainous regions. Water erosion potential typically increases with greater slope and is influenced by the presence of vegetation, desert pavement, and biotic crusts, while wind erosion potential is greatest where soils are fine-grained sands and silts. Many of the valley soils are subject to moderate or high wind erosion potential. Rill and gully erosion are also common in some of the valleys, with accelerated erosion in localized areas associated with road crossings (U.S. Air Force 1999).

Currently available published literature (U.S. Air Force 1986, 1999) regarding soils at the Gila Bend AFAF describes that they consist primarily of the Gunsight-Rillito-Pinal association. This association consists of soils that are gravelly loams, gravelly sandy loams, and very gravelly loams. They are located on alluvial fans and drainage ways. Additionally, soils of the Laveen-Rillito association can be found within the BMGR interior along roads proposed for convoy training (see Figure 2-3). These soils are loams, gravelly sandy loams, and fine sandy loams located on stream terraces and low fan

terraces. For both associations, there are no wind erosion hazards, and the water erosion hazard is slight.

The soils at the proposed expeditionary billeting and operations sites have been modified to accommodate previously existing uses, including some subsurface earth work. Soils within the lots proposed for expeditionary billeting (refer to Figure 2-1) have been extensively disturbed by grading and earth moving activities associated with construction and later demolition and removal of family housing facilities. Although the majority of these areas contain bare soil with little to no vegetation or infrastructure, some remnant concrete pads and utility infrastructure are evident (refer to Photo 4).

3.10 WATER RESOURCES

This section focuses on surface and ground water within the BMGR generally, and within the Gila Bend AFAF. The Clean Water Act (CWA) of 1972 is the primary federal law that protects the nation's waters, including lakes, rivers, and aquifers. The primary objective of the Act is to restore and maintain the integrity of the nation's waters. Jurisdictional waters of the U.S. are regulated resources and are subject to federal authority under Section 404 of the CWA. This term is broadly defined to include navigable waters (including intermittent streams), impoundments, tributary streams, and wetlands.

3.10.1 Surface Water Features and Drainage Patterns

The BMGR is located in one of the most arid and hottest regions of North America and lies within the central portion of the Sonoran Desert in the Basin and Range Lowlands Hydrogeologic Province. The rainfall pattern is distinctly bimodal (winter and summer), and averages 5.7 inches per year at Gila Bend. Surface waters are typically present on the BMGR only after rains fill washes, playas, or natural or human-made catchments. There are no perennial or intermittent streams present on the range (ARCADIS, Geraghty & Miller 1998).

The Gila Bend AFAF is located in the Lower Gila hydrologic basin (Arizona Department of Water Resources [ADWR] 2001). Surface water resources within the area are very limited and no permanent natural water sources are present in the vicinity.

Some surface water on the BMGR is retained in small, widely dispersed catchments, including natural rock depressions (referred to as "tinajas"), sand tanks (saturated sand depressions), charcos (pools within adobe flats and washes), and playas (closed basin drainages). Other, minor sources of surface water on the BMGR include springs and seeps. Over the past few decades, Arizona Game and Fish Department (AGFD) and others have modified many of the natural surface water catchments to retain ephemeral runoff for wildlife. There are 25 actively managed artificial or enhanced natural catchments on BMGR East. None of these natural or manmade catchments occur in close proximity to the proposed Gila Bend AFAF project area. Some roads in the vicinity, including those proposed for convoy training use, may have created some degree

of impediments or diversions to natural drainage flow. Impediments are most pronounced where disturbance is perpendicular to natural drainage flow and diversions are most pronounced when disturbance is parallel with natural drainage flow.

Watersheds and Major Drainages

Drainage of surface water in the area generally flows by ephemeral washes into larger washes that flow northward to the Gila River, which in turn flows west-southwest into the Colorado River. The entire Gila Watershed drains approximately 57,900 square miles of the southwestern United States (ADWR 2001). The Gila River and its tributaries constitute the main drainage in the Lower Gila River Basin. Following the construction of upstream dams, flow became ephemeral in response to heavy, localized rainfall or water releases from these dams. Most of the time the riverbed is dry except for local ponds and agricultural drainage siphoned into the riverbed. The Gila River and tributary drainages flow in response to the brief but intense summer monsoonal rainstorms or the longer duration rainfall events typical of the winter and spring. Some storms cause flash flooding in the smaller mountain drainages and short-term flooding in the larger valley washes and floodplains. Natural flooding events are highly variable in frequency and intensity and can have a large effect on natural community composition, structure, and function.

South of the Gila Bend AFAF, the Saucedo Valley drains north-northwest into the Gila Bend Plain. Rainfall from the high-relief Sand Tank and Saucedo mountains, located southeast and south of the Gila Bend AFAF respectively, is quickly transported to a developed wash system in the Saucedo Valley floor through well-established mountain channels. The dominant washes providing drainage to the north and west toward the Gila River are the Quilotosa Wash, which primarily drains the Sand Tank Mountains, and the Saucedo Wash, which primarily drains the Saucedo Mountains. After draining the Sand Tank Mountains, the Quilotosa Wash runs along the western edge and diagonally across the southwestern quarter of the Gila Bend AFAF (refer to Figures 1-2 and 3-1) and is the most notable ephemeral drainage in the vicinity. This wash is undeveloped, but locally disturbed. During runoff events, water accumulates in low areas of the drainage bottom in the west-central portion of the Gila Bend AFAF. Numerous smaller, unnamed drainages found in the northern portion of the Gila Bend AFAF also trend north-northwest and are part of the Quilotosa Wash System. These small washes originate in the vicinity of the Gila Bend AFAF civil improvements. Surface runoff from the proposed expeditionary billeting and operations locations drains to the storm water system associated with adjacent paved roadways. During large rain events, discharges from this system eventually enter the Quilotosa Wash System via overland flow. Luke AFB applies management practices throughout the BMGR to limit sedimentation into any stream including satisfying the requirements of the earthmoving block permit issued by Maricopa County Department of Environmental Services. For more information on stormwater refer to Section 3.3.2, Utilities.

Activities on the Gila Bend AFAF that physically disrupt the ground surface can increase the vulnerability of soil to erosion caused by surface water runoff. Once in suspension,

sediment can degrade the physical, chemical, or biological quality of surface water. This potential has not been an important issue on the Gila Bend AFAF, however, because of the almost complete lack of perennial or seasonal surface water that may be affected by runoff from military use areas (U.S. Air Force 1999).

Floodplains

Although there are flood hazards in the BMGR along the major washes, the Federal Emergency Management Agency (FEMA) has not delineated 100-year floodplains on the BMGR. The closest delineated boundary in the project vicinity occurs to the north of the Gila Bend AFAF, along the upslope side of the Gila Bend Canal, along portions of Interstate 8, and along portions of the Southern Pacific Railroad (FEMA 1988).

3.10.2 Groundwater

Groundwater within the Gila Bend AFAF occurs primarily in floodplain and basin fill deposits. Groundwater recharge occurs from infiltration of rainfall runoff and underflow from adjacent alluvial basins (ADWR 2001). Depth to groundwater on the BMGR, based on limited water level data from wells, ranges from about 50 feet below ground surface along major wash tributaries near the Gila River to nearly 600 feet below ground surface near the mountain ranges (ADWR 2001). Depth to groundwater in the Gila Bend region is approximately 250 to 300 feet (USGS 1992).

Groundwater at the BMGR, including the Gila Bend AFAF, has been found to be of poor quality. Typically it has high concentrations of total dissolved solids and fluoride (ARCADIS, Geraghty & Miller 1998). Military agencies on the Gila Bend AFAF use water from wells primarily for construction and dust control. Two production wells currently supply water for needs at the Gila Bend AFAF and field activities at the Manned Ranges (U.S. Air Force 1999). Current annual water usage and additional well information can be found in Section 3.3.2, Utilities.

3.11 AIR QUALITY

3.11.1 Air Quality Regulations

With respect to air quality, the Gila Bend AFAF is under the jurisdiction of the Maricopa County Environmental Services Department and the remainder of BMGR East is under the jurisdiction of the ADEQ.

National and Arizona Ambient Air Quality Standards

As directed by the federal Clean Air Act (CAA), EPA established national ambient air quality standards (NAAQS) for six “criteria” pollutants at 40 CFR Part 50. These standards were adopted by the EPA to protect the public health (primary standards) and the public welfare (secondary standards). Table 3-5 (on next page), lists the NAAQS, which represent the maximum allowable atmospheric concentrations that may occur

while ensuring protection of public health and welfare, with a reasonable margin of safety. The six pollutants of concern are: carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. The units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). Standards differ for particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) and for particles less than 2.5 microns in size ($\text{PM}_{2.5}$). Short-term standards (1-, 3-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The significance of a pollutant concentration is determined by comparing it to the NAAQS.

TABLE 3-5
ARIZONA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide (CO)	9 ppm ($10 \text{ mg}/\text{m}^3$) 35 ppm ($40 \text{ mg}/\text{m}^3$)	8-hour ^a 1-hour ^a	None None
Lead	$1.5 \mu\text{g}/\text{m}^3$	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm ($100 \mu\text{g}/\text{m}^3$)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM_{10})	$50 \mu\text{g}/\text{m}^3$ $150 \mu\text{g}/\text{m}^3$	Annual ^b (Arithmetic Mean) 24-hour ^a	Same as Primary
Particulate Matter ($\text{PM}_{2.5}$)	$15.0 \mu\text{g}/\text{m}^3$ $65 \mu\text{g}/\text{m}^3$	Annual ^c (Arithmetic Mean) 24-hour ^d	Same as Primary
Ozone	0.08 ppm 0.12 ppm	8-hour ^e 1-hour ^f	Same as Primary
Sulfur Oxides	0.03 ppm 0.14 ppm -----	Annual (Arithmetic Mean) 24-hour ^a 3-hour ^a	----- ----- 0.5 ppm ($1300 \mu\text{g}/\text{m}^3$)

Notes:

- Not to be exceeded more than once per year.
- To attain this standard, the 3-year average of the weighted annual mean PM_{10} concentration at each monitor within an area must not exceed $50 \mu\text{g}/\text{m}^3$.
- To attain this standard, the 3-year average of the weighted annual mean $\text{PM}_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed $15.0 \mu\text{g}/\text{m}^3$.
- To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed $65 \mu\text{g}/\text{m}^3$.
- To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
- EPA revoked the 1-hour standard effective 15 June 2005 after designating attainment and nonattainment areas for the more stringent 8-hour standard. However, certain of the control measures developed and implemented for the 1-hour standard are required to remain in place to ensure continued progress toward attainment of the new 8-hour standard. To attain this standard, the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm must be greater than or equal to one.

Sources: EPA 2005a and ADEQ 2005b

The CAA requires each state to develop a State Implementation Plan (SIP) as the primary mechanism for ensuring that the NAAQS are achieved and maintained within that state. According to plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants. The CAA requires that states classify air basins (or portions thereof) as either “attainment” or “non-attainment” with respect to the criteria pollutants. If an air basin does not meet the NAAQS for one or more pollutants, based on assessment procedures provided in federal regulations (40 CFR 50 and 58), then the area is classified as “non-attainment” for that pollutant. The CAA

requires that federal actions in non-attainment and maintenance areas undergo a SIP conformity analysis to ensure that the action does not hinder future attainment of NAAQS and conforms to the applicable SIP. The area of potential effect for the proposed expeditionary training at Gila Bend AFAF and BMGR East is within an attainment area for all criteria pollutants. (The Phoenix metropolitan area portions of Maricopa County are in basic non-attainment for the 8-hour ozone and serious non-attainment for PM₁₀ and the Ajo area is in moderate non-attainment for PM₁₀ [EPA 2005b]).

The CAA Prevention of Significant Deterioration Program applies to new major sources or major modifications at existing sources for pollutants where the area the source is located in an attainment area (or unclassifiable area) under the NAAQS. The program provides special protection to Class I areas, identified as areas of special national or regional natural, scenic, recreational, or historic value (EPA 2004a). There are no designated Class I areas within or near the area of potential effect (EPA 2005b).

Maricopa County Rules

Maricopa County Rule 310 addresses control of fugitive dust and requires that any activity capable of generating fugitive dust (including but not limited to land clearing; earthmoving; weed abatement by discing or blading; excavating; construction; demolition; bulk material handling, storage and/or transporting operations; vehicle use and movement; the operation of any outdoor equipment; or unpaved parking lots) submit a Dust Control Plan with any permit applications that involve earthmoving operations with a disturbed surface area that equals or exceeds 0.10 acre (Maricopa County 2004a).

For the Gila Bend AFAF, the Air Force holds an annual block air quality permit for earthmoving operations per Maricopa County Rule 200, Section 305.2 (Oswald 2005). A comprehensive Dust Control Plan is required to be submitted prior to the issuance of this permit (Maricopa County 2005).

3.11.2 Existing Air Quality

The airshed, or geographic area that shares the same air as the area of potential effect, is expansive – bound to the west by Baja California's Sierra San Pedro Matir, to the north by the Colorado Plateau, to the east by the high-elevation mountains of eastern Arizona, and to the south by Mexico's Sierra Madre Occidental (Phillips and Comus 2000). The closest available air quality monitoring data in the vicinity of the area of potential effect is in Ajo, which is located about 37 miles south of Gila Bend AFAF (see Figure 1-1) and at a site established in August 2004 in Buckeye, which is located about 34 miles north of Gila Bend AFAF. Monitored air pollutant concentration data collected during 2001, 2002, and 2003 at Ajo, Arizona show annual average PM₁₀ concentrations of 14 µg/m³, 19 µg/m³, and 23 µg/m³, respectively. This is well below the NAAQS of 50 µg/m³ (annual average). Long-term monitoring data at Ajo show that PM₁₀ concentrations have decreased about 50 percent since 1985, when concentrations were 41 µg/m³ (ADEQ 2004, 2003, and 2002b). Data on the remaining five criteria air pollutants (ozone, carbon

monoxide, sulfur dioxide, nitrogen dioxide and lead) are not collected at the Ajo monitoring station.

The following monitoring data were recorded in Buckeye in 2004:

- **Carbon Monoxide:** maximum 8-hour carbon monoxide average of 0.5 ppm, well below the standard of 9.0 ppm.
- **Ozone (1-hour):** maximum 1-hour ozone average of 0.088 ppm, below the standard of 0.120 ppm
- **Ozone (8-hour):** maximum 8-hour ozone average of 0.068 ppm, below the standard of 0.080 ppm.
- **PM₁₀ (Annual):** 51 $\mu\text{g}/\text{m}^3$ was recorded, but the data set does not meet the data recovery ratio that is necessary for valid determination of compliance with the standard (50 $\mu\text{g}/\text{m}^3$).
- **PM₁₀ (24-hour):** maximum 24-hour PM₁₀ average of 289 $\mu\text{g}/\text{m}^3$, representing one exceedance of the 150 $\mu\text{g}/\text{m}^3$ standard (on September 14, 2004), as allowed for without exceeding the NAAQS. Of all 24-hour PM₁₀ average values, 75 percent were between 0 $\mu\text{g}/\text{m}^3$ and 50 $\mu\text{g}/\text{m}^3$ and 24 percent were between 51 $\mu\text{g}/\text{m}^3$ and 100 $\mu\text{g}/\text{m}^3$.
- **Nitrogen Dioxide:** annual average 0.011 ppm, well below the standard of 0.053 ppm (but this data set does not meet the data recovery ratio that is necessary for valid determination of compliance with the standard) (Maricopa County Air Quality Department 2005).

This limited monitoring data along with the relatively low level of industrial development and low density of vehicle traffic in the region are consistent with ambient air pollutant concentrations that are below NAAQS levels. Thus, the existing air quality over the area of potential effect is considered good to excellent.

3.11.3 Climatic and Meteorological Conditions

Air quality is influenced by climatic and meteorological conditions. For example, when the atmosphere is stable, emitted pollutants tend to remain within a few hundred feet of the surface (close to the emission sources), and will begin to diffuse horizontally across the surface. When the atmosphere is unstable, air pollution is free to mix with the atmosphere and will vertically rise 1,000 feet or more, and be carried away in the prevailing wind. Ozone is the result of a reaction in the atmosphere of volatile hydrocarbons with oxides of nitrogen. This reaction is promoted by the presence of sunlight and high air temperatures, both of which are prevalent in the area of potential effect (U.S. Air Force 1999).

In the area of potential effect, atmospheric stability of the region depends on the season. During the summer, the frequency and duration of stable and unstable conditions of the atmosphere over the area are in relative balance. The periods of instability are typically due to the monsoon rain events that occur almost daily during the summer months. When temperatures decrease as winter approaches, stability in the atmosphere becomes more prevalent and mid-latitude high pressure conditions tend to be dominant over southern

Arizona and northern Mexico. These observations mean that air pollutants that are released into the atmosphere are less likely to be effectively and thoroughly dispersed during the fall and winter months than during the summer months. This then leads to higher concentrations of air pollutants in the winter than during the summer (U.S. Air Force 1999).

Temperatures in the area of potential effect range from 30 to 45°F during the winter, to more than 100°F during the summer. Daily temperatures of 90°F or greater occur approximately 40 to 50 percent of the year. During the summer months, maximum temperatures of 120°F or greater have been reported. Precipitation in the area is sparse and is limited primarily to rainfall, although traces of snow, sleet, or hail have been reported. Rainfall occurs primarily during the monsoon season from July through early October. Large amounts of warm, moist air moving from the Gulf of Mexico can create heavy thunderstorms across Arizona. Average annual precipitation at Ajo is 8.95 inches. Surface winds during the monsoon season primarily originate from the south-southeast or the south-southwest. After the monsoon season, westerly winds prevail (Sellers and Hill 1974).

3.12 BIOLOGICAL RESOURCES

Biological resources include native and naturalized plants and animals and the habitats in which they occur. This biological resources discussion includes separate subsections for vegetation, wildlife, and special status species. The area of potential effect for biological resources is principally the area in and around the proposed expeditionary training sites at Gila Bend AFAF. It also includes the following locations within BMGR East south of the Gila Bend AFAF: (1) the vicinity of the four roadway corridors that may be used in convoy training associated with ETT and (2) the vicinity of the small arms range, which may be used for weapons familiarization training associated with ETT training. As the proposed action would not affect flying operations at BMGR East or the numbers and types of munitions delivery operations activities at BMGR East associated with AEF training, this area is not considered within the area of potential effect for biological resources. The relationship between ongoing BMGR training activities and biological resources was evaluated in detail in the Legislative Environmental Impact Statement for the Renewal of the BMGR Land Withdrawal (U.S. Air Force 1999) and in the accompanying Biological Opinion (USFWS 1997) as updated (USFWS 2003a).

3.12.1 Vegetation

The area of potential effect lies within the Lower Colorado River Valley Subdivision of the Sonoran Desert (Turner and Brown 1982). Gila Bend AFAF is relatively flat with a few well-developed washes crossing the area. The largest drainage is Quilotosa Wash, which crosses the western border of the facility. Increased moisture availability in washes, including the smaller ones, results in an increase in plant diversity and a woodland aspect compared with the interwash flats (Luke AFB 2000). Four vegetation categories have been identified in the Gila Bend AFAF area (Luke AFB 1995):

Microphyllous desertscrub

Vegetation of the intermontane valleys of this region is dominated by low-growing, drought-resistant scrubs, such as creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and triangle leaf bursage/burro bush (*Ambrosia deltoidea*) (Luke AFB 1997b). The scrub community is mixed with annual plants following winter precipitation. The creosote bush-bursage series (Brown et al. 1979) falls under the broad Microphyllous desertscrub vegetation category, and represents the principle vegetation type of Gila Bend AFAF. It is also the overwhelmingly dominant vegetation type of the Gila Bend Valley and much of southwestern Arizona (Luke AFB 2000). Vegetation in BMGR East surrounding the potential convoy road corridors and small arms range areas south of Gila Bend AFAF that may be used during ETT training is predominantly creosote bush-bursage series, like much of the vegetation in the undeveloped areas of Gila Bend AFAF.

Microphyll woodlands

The banks of large and small washes support woody vegetation classified as the blue paloverde (*Cercidium floridum*) - ironwood (*Olneya tesota*) - smoketree (*Dalea spinosa*) xeroriparian association of Brown et al. (1979) (Luke AFB 2000). Quilotosa Wash supports this association of small trees along with a few velvet mesquites (*Prosopis velutina*). There is also relatively dense understory of shrubby species including catclaw (*Acacia greggii*), Anderson thornbush (*Lycium andersonii*), burro bush and desert broom (*Baccharis sarothroides*), and brittle bush (*Encelia farinosa*). An association of shrubby ironwood and velvet mesquites dominates smaller washes, man-made ditches, and other low areas where water may collect. Understory development on these smaller washes is not as developed as on the larger ones (Luke AFB 1997b; Luke AFB 2000).

Disturbed sites

Disturbed areas occur in zones of heavy use and previously demolished facilities, primarily between the runways, tarmac, and around the footprints of buildings. The disturbed areas at Gila Bend AFAF are characterized by a lack of vegetation or are dominated by fast-growing native species such as triangle leaf bursage/burro bush, paper daisy (*Psilostrophe cooperi*), and weedy invasives (Luke AFB 1995). Some disturbed areas retain creosote bush/bursage vegetation, but the density and species diversity is greatly reduced relative to the surrounding undisturbed areas. Severely disturbed areas (e.g., paved areas, areas of bare ground or burro bush) will not likely return to predisturbance conditions (U.S. Air Force et al. 2005). The proposed locations for the billeting area (tent city) and the expeditionary operations area occupy previously disturbed, but now vacant lots. The BMGR East roadbeds and small arms facility are also previously disturbed.

Landscaped sites

A variety of planted native and non-native vegetation exists at some developed areas and formerly occupied facilities and locations (Luke AFB 1995; U.S. Air Force et al. 2005).

3.12.2 Wildlife

Wildlife species, and their associated habitats, at Gila Bend AFAF are characteristic of those found throughout the Lower Colorado River Valley subdivision of the Sonoran Desert (Turner and Brown 1982). Three of six general habitat types that have been identified as of particular importance to wildlife species within the BMGR occur within or near the area of potential effect: microphyll woodlands, lowlands, and (within in the vicinity of BMGR East convoy roads and small arms facility) upland habitats. However, not all wildlife species occur uniformly throughout any given vegetation type (Luke AFB 2000).

Common bird species in the Gila Bend AFAF area are Gambel's quail (*Callipepla gambelii*), loggerhead shrike (*Lanius ludovicianus*), and white-crowned sparrow (*Zonotrichia leucophrys*) (Luke AFB 2000). The black-throated sparrow (*Amphispiza bilineata*) and lesser nighthawk (*Chordeiles acutipennis*) are the only two birds expected to nest in creosote bush-bursage flats. Native birds that may nest in the non-native ornamental vegetation in Gila Bend AFAF include greater roadrunners (*Geococcyx erythrophthalmus*), great-tailed grackle (*Quiscalus mexicanus*), Inca dove (*Columbina inca*), mourning dove (*Zenaida macroura*), and white-winged dove (*Zenaida asiatica*). Great horned owl (*Bubo virginianus*) and red-tailed hawk (*Butea jamaicensis*) may nest in larger trees; Gila woodpeckers (*Melanerpes uropygialis*) and American kestrels (*Falco sparverius*) may nest in saguaros (Luke AFB 1997b). Wastewater treatment ponds at Gila Bend AFAF attract a number of bird species to the area, many of which would not be expected in the absence of water (Luke AFB 2000).

Mammalian wildlife in Gila Bend AFAF is typified by bats and nocturnal burrowing rodents, especially kangaroo rats (*Dipodomys* spp.) and pocket mice (*Perognathus* spp.). White-throated woodrats (*Neotoma albigula*) occupy the wash habitat (Luke AFB 2000). Carnivores such as gray fox, kit fox, and coyote, and herbivores mule deer may be found in Gila Bend area habitats (Luke AFB 1995).

Amphibians are limited because of arid conditions, although several species of highly adapted toads potentially occur in the area. Among reptiles, the side-blotched lizard (*Uta stansburiana*) and western whiptail (*Cnemidophorus tigris*), are common lizard species. Tree lizards (*Urosaurus ornatus*) are common along washes as is the desert spiny lizard (*Sceloporus magister*). Numerous snake species are relatively common in this lowland desert area (Luke AFB 2000).

3.12.3 Special Status Species

No federally listed threatened, endangered, or candidate species of plant is likely to occur at Gila Bend AFAF (Luke AFB 2000). The acuña cactus (*Echinomastus erectocentrus acunensis*) is a candidate for federal listing, but is found in only one location on BMGR, outside of the proposed action area (U.S. Air Force et al. 2005). This plant species is not present and will not be discussed further.

Special-status animal species that may be found in habitats in the vicinity of the project area include the Sonoran population of the desert tortoise, lesser long-nosed bat, California leaf-nosed bat, southern yellow bat, Sonoran pronghorn, and cactus ferruginous pygmy-owl, (AGFD 2002; Luke AFB 1997b; Luke AFB 2000).

The potential presence of special status species within or new the area of potential biological effect is summarized in Table 3-6, which is followed by descriptions of each species.

TABLE 3-6 SPECIAL STATUS SPECIES POTENTIALLY PRESENT ON, WITHIN, OR NEAR THE AREA OF POTENTIAL BIOLOGICAL EFFECT						
Common Name Scientific Name	Federal Status*	State Status*	Presence/Potential Within/Near the Area of Potential Effect			Habitat/Relevant Data on Populations Within/Near the Area of Potential Effect
			Species Present	Species Not Expected	Potential Habitat Present	
PLANTS						
Acuña cactus <i>Echinomastus erectocentrus acunensis</i>	C	HS		✓		Some populations have been observed east and south of the area of potential effect; low potential for habitat near potential BMGR East convoy training roads
REPTILES AND AMPHIBIANS						
Desert tortoise (Sonoran population) <i>Gopherus agassizii</i>	—	WC		✓		Habitat qualities are present in the bajada areas near some of the proposed convoy training roads and small arms range

TABLE 3-6 SPECIAL STATUS SPECIES POTENTIALLY PRESENT ON, WITHIN, OR NEAR THE AREA OF POTENTIAL BIOLOGICAL EFFECT						
Common Name <i>Scientific Name</i>	Federal Status*	State Status*	Presence/Potential Within/Near the Area of Potential Effect			Habitat/Relevant Data on Populations Within/Near the Area of Potential Effect
			Species Present	Species Not Expected	Potential Habitat Present	
MAMMALS						
Lesser long-nosed bat <i>Leptonycteris curasoae yerbabuena</i>	E	WC		✓		Known summer roosting sites are well to the south of the area of potential effect; portion of southernmost convoy road (to Manned Range 4) is within 40 miles of potential foraging radius of one roost
California leaf-nosed bat <i>Macrotus californicus</i>	—	WC			✓	Known roost sites are located in the Saucedo and Sand Tank Mountains; foraging may occur within southernmost and easternmost areas of potential effect
Southern yellow bat <i>Lasiurus ega</i>	—	WC		✓		Known to occur in association with palm trees (which are present at the Gila Bend AFAF)
Sonoran pronghorn <i>Antilocapra americana sonoriensis</i>	E	WC		✓		Current distribution (east of Gila and Tinajas Altas mountains, west of State Route 85) is south and east of the area of potential effect
BIRDS						
Cactus ferruginous pygmy-owl <i>Glaucidium brasilianum cactorum</i>	E	WC		✓	✓	Targeted surveys conducted in BMGR East since 1992 have not identified owl; potential habitat exists in xeroriparian areas
*Status Abbreviations: C=Candidate E=Endangered HS=Highly Safeguarded WC=Wildlife Species of Concern in Arizona Adapted from U.S. Air Force et al. 2005. Sources: U.S. Air Force 1986 and 1999; Arizona Department of Agriculture 1999, AGFD 1996 (in prep).						

Sonoran Population of Desert Tortoise

The desert tortoise (*Gopherus agassizii*) is a federally threatened species throughout much of its range; however, the Sonoran population (defined as south and east of the Colorado River) it is not considered threatened. The Sonoran subpopulation is nonetheless listed on the Arizona Game and Fish Department list of Wildlife of Special Concern (1996 in preparation). Tortoises burrow in loose soil and caliche caves along the banks of river beds and ephemeral washes; however, Quilotosa Wash does not have extensive, exposed caliche or other features that would provide burrow sites for tortoises (Luke AFB 1997). The Sonoran population occurs primarily on rocky slopes within desert scrub vegetation; the terraces and valleys between mountain ranges are generally not considered habitat for the tortoise (U.S. Air Force et al. 2005), and desert tortoises have not been observed occupying the flat basins where Gila Bend AFAF is situated.

(Dames & Moore 1996; Luke AFB 2000). However, potential habitat does occur along some of the BMGR East roads that may be used for convoy training and near the BMGR East small arms range (U.S. Air Force et al. 2005).

Lesser Long-nosed Bat

The lesser-long nosed bat (*Leptonycteris curasoae yerbabuenae*) is a summer visitor to southern Arizona, spending winter months in Mexico. This federally endangered bat species occupies desert grasslands and shrublands, feeding on nectar and pollen from agave and cacti. Habitat requirements are an extensive population of columnar cacti and suitable dry roost sites, such as caves and mines. Populations of the lesser-long nosed bat are endangered due to habitat exclusion, reduction in maternity roosts, and disturbance of native agave communities (USFWS 1994a). The lesser long-nosed bat could potentially forage in the area of potential effect; however, the closest known roost site is located more than 50 miles to the south of the Gila Bend AFAF. Typically, these bats travel 12.5 from their roost sites when foraging, but they may forage as far as 40 miles from their roost sites. The southernmost convoy roads and the BMGR East small arms range are located at the outward extent of a 40-mile radius from this known roost site.

California Leaf-nosed Bat

The California leaf-nosed bat (*Macrotus californicus*) is listed by the AGFD as Wildlife of Special Concern, although it is not federally protected. This species has been located throughout the BMGR, with roosts in the Sand Tank and Saucedo mountains, Mohawk Mountains, Copper Mountains, Wellton Hills, and Gila Mountains (U.S. Air Force et al. 2005). The California leaf-nosed bat is a year-round resident of southwestern Arizona, feeding nocturnally on insects in high-density saguaro areas and desert scrub habitats (Luke AFB 1995). Studies of foraging patterns of the Sand Tank Mountains population have found that the bats move between a maximum of seven day roost sites and a minimum of four night roost sites. Foraging area for individual bats ranged from 0.3 to 18.3 square miles (0.7 to 47.3 square km) and ranged from valley floors to slopes and ridges, with a tendency towards valleys in the summer and slopes and ridges in winter. Total foraging area was estimated to range from 5.7 to 10.5 square miles (14.9 to 27.2 square kilometers) (Dalton et al. 2000, Dalton 2001). Therefore, there is the potential that bats roosting in the Sand Tank and Saucedo mountains could forage along the southern and easternmost portions of the proposed convoy roads and in the vicinity of the small arms range.

Southern Yellow Bat

Like the California leaf-nosed bat, the southern yellow bat (*Lasiurus ega*) is not federally protected, but is listed as Wildlife of Special Concern (AGFD 1996 in preparation; U.S. Air Force et al. 2005). The southern yellow bat is found in association with palm trees and riparian areas. Southern yellow bats were not found in BMGR surveys of inactive mines (Dalton and Dalton 1994).

Sonoran Pronghorn

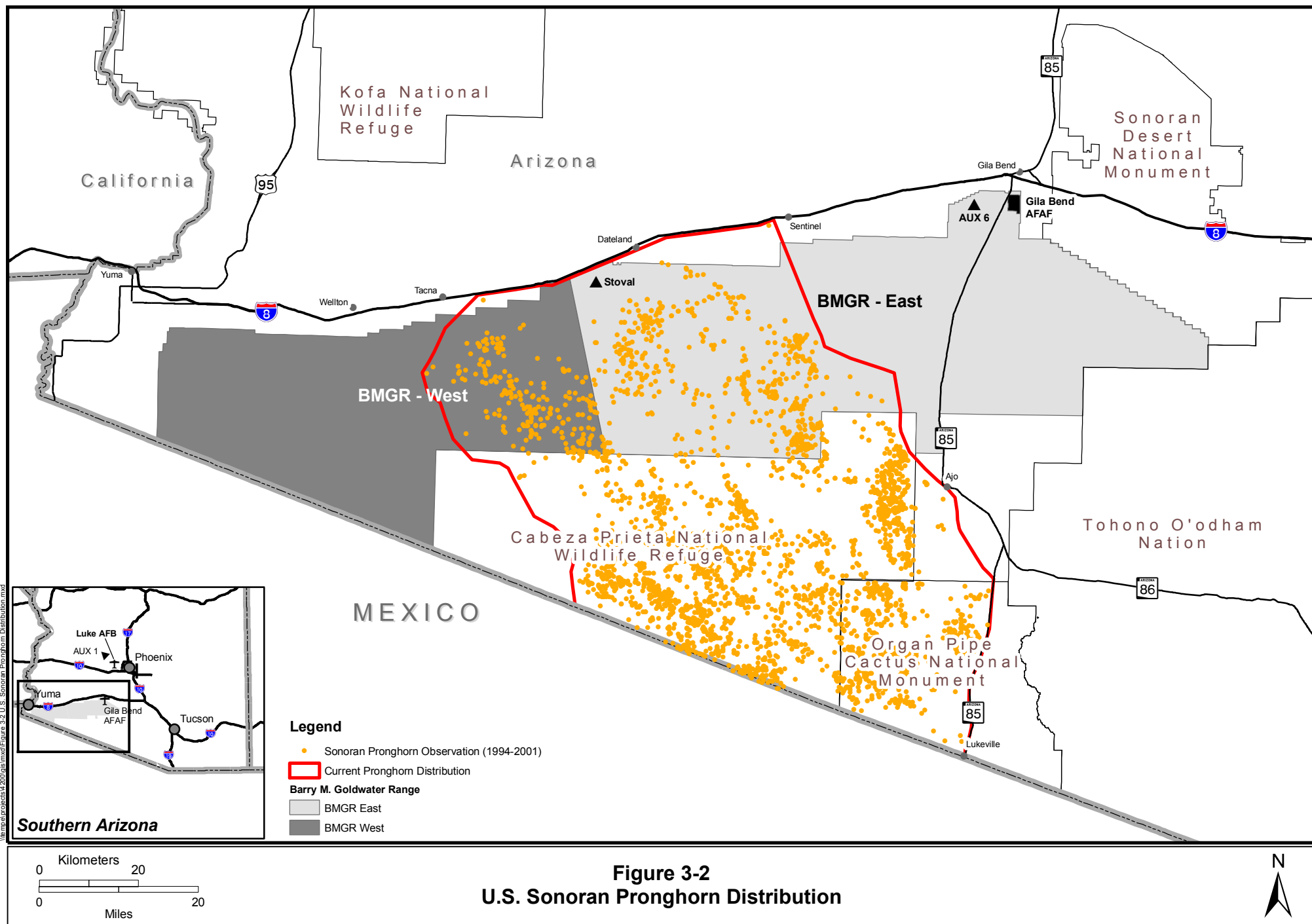
The Sonoran pronghorn (*Antilocapra americana sonoriensis*) is federally listed as endangered and listed as a Wildlife Species of Special Concern in Arizona. No critical habitat has been designated for this species. The historic range of the Sonoran pronghorn habitat occupied southern Arizona, California, and northern Mexico (AGFD 2002). The current known distribution in southwest Arizona extends into the BMGR west of State Route 85 (Figure 3-2). These animals have highly variable home ranges that range from 142 square kilometers to 4,067 square kilometers, with an average home range size of 920 square kilometers (Hervert et al. 2000). The desert habitat is variable throughout the range of the Sonoran pronghorn. They are known to occupy paloverde-saguaro plant associations and creosote-bursage associations in the Lower Colorado River area. Fawning takes place from February to May, during which females seek out areas of dense ground cover (AGFD 2002).

Several explanations for the decline of the Sonoran pronghorn are cited in the Final Revised Sonoran Pronghorn Recovery Plan (with Supplement and Amendment) (USFWS 1998; USFWS 2003a). The reasons for the historic decline of this species include habitat changes and loss from livestock grazing, farming, mining, and settlement; habitat fragmentation from fences, railroads, irrigation canals and large-scale agriculture, U.S. Route 80, State Route 85 and continuing mining and settlement; legal hunting until the early 1920s and some subsequent poaching (especially in Mexico); disease introduction by livestock; and dewatering of the Gila River by dams and diversions. Recovery obstacles have included continued habitat loss from large-scale agriculture, settlements, military use, border activities, and other developments; increased habitat fragmentation from highways; sub-populations increasingly isolated from population migrations and genetic exchange; and ongoing livestock grazing. This habitat loss, modification, and fragmentation; isolation of sub-populations; and loss of historic waters and refuges have greatly exacerbated the effects of drought (USFWS 2003a, USFWS 2003b).

The Gila Bend AFAF is located approximately 25 miles to the northeast of the area of current distribution of Sonoran pronghorn. Of the isolated areas to the south Gila Bend AFAF that may be used to support convoy training and weapons familiarization training associated with ETT, the closest to the current range of Sonoran pronghorn is the Range 4 road, which is located approximately 10 miles to the east of the current range of the Sonoran pronghorn (see Figure 3-2).

Cactus Ferruginous Pygmy-owl

The cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is federally listed as endangered in Arizona and is included among endangered species in the list of AGFD's Wildlife of Special Concern in Arizona (USFWS 1994b, AGFD 1996 in preparation). Critical habitat was designated for this species in 1999 but was vacated by a court decision in 2001 due to inadequate study of economic impacts. In 2002, critical habitat was again proposed for this species, but did not include the BMGR (67 Federal



Register 229, pages 71032-71064). Following the proposal for new critical habitat, the USFWS was sued and the 19 August 2003 court ruling on the case found that the USFWS acted arbitrarily and capriciously in designating the Arizona pygmy-owl population as a distinct population segment. The USFWS subsequently reviewed the distinct population segment criteria, found that the criteria were not satisfied, and published a proposed rule on 3 August 2005 to remove the Arizona population of pygmy-owls from the list of endangered species, remove the critical habitat designation, and withdraw the rule to designate new critical habitat (70 Federal Register 148, Pages 44547 – 44552). The comment period for this proposed rule ended 3 October 2005, but no final rule has yet been issued.

Populations of what was once assessed as a distinct population segment of cactus ferruginous pygmy owls in Arizona appear to have declined substantially since 1950 (AGFD 1996 in preparation), most likely because of loss of riparian forests and woodlands (Millsap and Johnson 1988), urban development, and competition with starlings for nesting cavities (AGFD 1996 in preparation). The range of the cactus ferruginous pygmy-owl includes the southern half of Arizona and Texas, south to Colima and Michoacan in western Mexico and Tamaulipas and Nuevo Leon in eastern Mexico. In Arizona, resident populations of the cactus ferruginous pygmy-owl are found in xeroriparian washes. The owl is known to occur in areas of Organ Pipe Cactus National Monument, northwest Tucson, Altar Valley, Coyote Mountains, and the Tohono O'odham Nation (USFWS 1999; U.S. Air Force et al. 2005). Their territories have been described as linear (washes), and between 1.3 to 3.5 acres (Millsap and Johnson 1998). Based on the known distribution of this species in southwest Arizona and the presence of its habitat characteristics in xeroriparian areas of the range, the cactus ferruginous pygmy owl is expected to occur on BMGR East. However, no pygmy owls have been detected on the range despite targeted surveys that have been conducted since 1992. In recent years, cactus ferruginous pygmy-owls have been detected in areas near the eastern BMGR boundary (U.S. Air Force et al. 2005). This species may potentially occur in the xeroriparian washes near the Gila Bend AFAF, small arms range, and traversed by the four roads proposed to be used in the ETT convoy training.

3.13 ENVIRONMENTAL JUSTICE

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, issued in 1994, directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

Racial composition and Hispanic ethnic origin statistics and poverty data are provided in Table 3-7 (on next page) as a percentage of the population for Gila Bend and Census Tract 7233.02. The percent of the population with incomes below the poverty level in 1999 are also provided as a measure of low-income populations. These statistics were compared to data for the county and state statistics to determine if any minority or low-

income communities exist in the area that could be disproportionately affected by the proposed action. Based on this analysis, Gila Bend and Census Tract 7233.02 are characterized as minority populations, based on the prevalence of Hispanics. These same areas are characterized as low-income, based on their relatively higher percentage of persons with incomes below the poverty level.

TABLE 3-7 MINORITY AND LOW-INCOME STATISTICS							
	Race¹					Hispanic Origin³	Percent below poverty level⁴
	White	African American	Alaskan Native and American Indian	Asian, Native Hawaiian and Pacific Islander	Other ²		
State of Arizona	75.5%	3.1%	5.0%	1.9%	14.5%	25.3%	9.9%
Maricopa County	77.4%	3.7%	1.9%	2.3%	14.8%	24.9%	8.0%
Gila Bend	51.3%	1.3%	10.3%	0.4%	36.8%	52.6%	22.2%
Census Tract 7233.02 (North of BMGR East)	59.1%	1.6%	10.3%	0.2%	28.7%	38.6%	19.4%

Notes: ¹ Race data based on total races tallied.

² Other includes those reporting other races and those reporting two or more races.

³ Persons of Hispanic origin are of any race.

⁴ Percent of the population with income in 1999 below the poverty level (the poverty level for a family of four in 2000 having two children under the age of 18 was \$17,463)

Source: U.S. Census Bureau 2000

4.0 ENVIRONMENTAL CONSEQUENCES

Environmental impacts, or modifications to the environment that are brought about by an outside action, can be beneficial or adverse. This chapter contains the scientific and analytical basis for the predicted environmental consequences of the proposed action and no-action alternative. The significance of the impact is evaluated in consideration of both context and intensity as required by CEQ regulations (40 CFR 1508.27). Impacts can be described as direct (effects that are caused by the action or occur at the same time and place) or indirect (effects that are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable). The following subsections address the direct and indirect impacts of the proposed action and no-action alternative on the resources in the same order as they were discussed in Chapter 3.0. This chapter concludes with an analysis of other environmental impacts (including unavoidable adverse effects, the relationship between short-term uses and long-term productivity, and irreversible or irretrievable commitment of resources) cumulative effects, and compatibility with local land use plans, policies, and controls.

4.1 AIRSPACE AND RANGE OPERATIONS

4.1.1 Alternative A – Proposed Action

The proposed action to conduct AEF training from Gila Bend AFAF would have no effect on the airspace or flying operations at BMGR East. No discernible change would occur in the numbers of sorties flown at BMGR East as a result of AEF training deployments to Gila Bend AFAF because these training sorties are already being flown at the range but are simply launched and recovered from their home base rather than from the auxiliary airfield. All AEF flying and ordnance delivery activities at BMGR East would continue to be conducted in accordance with AFI 13-212 Volume 1, Luke Supplement 1, and would not be affected by the launch and recovery of the aircraft from Gila Bend AFAF.

AEF training would increase the number of the flying operations at Gila Bend AFAF over what would occur with the no-action alternative. The estimated increase of 3,120 to 3,600 operations at the Gila Bend AFAF would be only about 10 percent more than the average 34,000 annual operations that have occurred at the airfield during the last 10 years and would be well below the maximum of 45,000 operations that occurred during this period of record. All AEF flight activity at Gila Bend AFAF would be conducted in accordance with the established operating procedures for the auxiliary airfield.

ETT activities would have no effect on airspace or flying operations at either BMGR East or Gila Bend AFAF. ETT convoy training activities within BMGR East would occur on established roads that are outside of the active surface and airspace areas that are reserved for either the tactical or manned ranges.

4.1.2 Alternative B – No Action Alternative

With the no-action alternative, AEF and ETT training conducted by the 56 FW would continue to occur at Luke AFB. For AEF training, aircraft would continue to be launched and recovered from Luke AFB, but flying and ordnance delivery activities would continue to be conducted at BMGR East in accordance with AFI 13-212 Volume 1, Luke Supplement 1. Other regional users also would continue to conduct expeditionary training at their home installations or at other locations to which they currently deploy. Consequently, there would be no change to airspace or range operations as a result of taking no action.

4.2 LAND USE

4.2.1 Alternative A – Proposed Action

There would be minor impacts to land use at Gila Bend AFAF as a result of implementing the proposed AEF and ETT training at the installation. Certain locations within the cantonment area that are currently vacant would be used AKSSS tents for billeting and operational training. To prepare the sites for this use, construction activity would occur to make the necessary modifications to utility infrastructure and to pour concrete foundations. Most of the impacts to land use would occur during the active use of these areas during expeditionary exercises. Use of these lands for expeditionary billeting and operational training is compatible with the current uses of the installation lands. The billeting AKSSS tent optional locations are appropriately sited away from the airfield operations area and nearby dining, personnel support, and recreation uses. The land use pattern in this portion of Gila Bend AFAF has not changed since the time when these areas were used for family housing. The operational AKSSS tent optional locations (proposed to be used to serve command, operations, logistics, maintenance, and potentially medical training) are appropriately sited near other existing operational and command and control land uses near the airfield. Furthermore, this land use is consistent with the land use conditions that military personnel may encounter at a remote air base in deployed areas of operation.

The proposed action would dedicate the expeditionary billeting and operational training land areas to support the AEF and ETT programs. It would be necessary to plan for these continued land uses and land use conditions for ongoing and future land use at Gila Bend AFAF, including ensuring long-term compatibility of expeditionary training with potential future land uses.

Other ongoing land uses and land use patterns would not be substantially altered by the implementation of the proposed action. The use of other existing facilities and associated land uses including the fire station/emergency response (Building 314), deployment training facilities (Building 41), security services, POL storage, billeting/dining facility (Building 4300), former housing units used to support personnel deployed to the auxiliary field, officer/VIP billeting (Building 2358), Luke AFB range management office/environmental science management personnel (Building 2360), aircraft ramp, and

the MSA in support of the proposed action are all uses that are consistent with current use and would not alter the pattern and interactions among existing Gila Bend AFAF land users. The use of BMGR East training ranges for AEF aviation and munitions delivery training would not differ from current use of these areas for operations that are currently staged out of Luke AFB.

The use of certain BMGR East roads or road segments (AUX-6 access and perimeter road, Range 4 access road, Dart Drop Road, and CSAR Trail) for convoy training during ETT deployments would be consistent with current uses of these roads and associated land uses. There would be no impact to public recreation on the BMGR as a result of the proposed action because these roads and this area of BMGR East are closed to public access to protect public safety.

Similarly, the use of the BMGR East Air Force small arms range during proposed expeditionary training exercises within the normal (ongoing) range specifications would not impact land use in and near this facility.

4.2.2 Alternative B – No Action Alternative

The no-action alternative would have no impact to land use at Gila Bend AFAF or BMGR East. The currently empty lots that were the site of former family housing and the base theater would remain unused until such time as a new compatible use was identified for these areas. The lands at Luke AFB, Davis-Monthan AFB, and WAATS currently used for expeditionary training would continue to be used for such training to the extent that it can be accomplished at these installations.

4.3 GROUND TRANSPORTATION AND UTILITIES

4.3.1 Ground Transportation

Alternative A – Proposed Action

During periods of AEF and ETT training at Gila Bend AFAF, there may be slight increases in the number of vehicles using Gila Bend AFAF on-installation roads or a change in transportation patterns on Gila Bend AFAF on-installation roads as various exercises are conducted and equipments and supplies are positioned. There is currently light traffic at the installation, with peaks occurring when there is a change in shift for the approximately 140 individuals who regularly work on the installation. Therefore, these impacts are expected to be minimal and intermittent.

The ground transport of troops, vehicle, and equipment to the Gila Bend AFAF from Luke AFB and other regional installations (e.g., Davis-Monthan AFB and WAATS) would be negligible in terms of average traffic on the public routes that may be used. As noted in Section 3.3, annual average daily traffic on these roads ranges from more than 127,000 vehicles on some portions of Interstate 10 to 1,100 vehicles along the stretch of State Route 85 from the Town of Gila Bend to Gila Bend AFAF. Traffic associated with

AEF and ETT would amount to less than one percent of traffic on the lightest traveled segments of public roads proposed for use.

The use of the BMGR East roads for convoy training would potentially result in a slight increase in traffic on these existing roadways, but would represent a minor, localized, and transient impact on existing ground transportation conditions not likely to aggregate with traffic from other existing uses of these roads (described in Section 3.3.1). Because these roads are not open to the public, there would be no effect on public transportation.

Alternative B – No Action Alternative

There would be no impact on transportation should the no-action alternative be selected.

4.3.2 Utilities

Alternative A – Proposed Action

As noted in Sections 2.1.1 and 2.1.2, the tent city expeditionary billeting area and the expeditionary operations area would be served by extensions/upgrades to the existing Gila Bend AFAF electrical system/infrastructure, which extends to these site locations. There is an existing sewer lift station and connectivity for all utilities needed in the vicinity of the proposed optional tent city locations between B Street and C Street and north of 4th Street.

The existing electrical system has the capacity to accommodate such use and, aside from possible interruptions in service during site preparation activities, no impacts to the existing Gila Bend AFAF electrical system are foreseen. The electrical system would power the HVAC systems, lighting, and various types of equipment. Energy consumption per AKSSS would be expected to be somewhat lower than residential averages in Arizona, which are approximately 32 kilowatts hours per day (U.S. Department of Energy 2003). Energy consumption also would be expected to be higher with those expeditionary training events occurring in the hottest summer and coldest winter months than those occurring during more temperate times of the year.

There are two options for human waste disposal: (1) serve through extension of the existing wastewater treatment infrastructure and process waste through the existing wastewater treatment system or (2) commercial portable toilets. It is estimated that the Gila Bend AFAF wastewater system has the capacity to process up to 24,000 gallons per day in addition to the current 10,000 gallons per day under current aquifer protection permit allowances. Assuming a standard water usage of 25 gallons per person per day for deployed personnel, it is estimated that the maximum additional wastewater processing requirements resulting from the proposed action would be 7,200 gallons per day. This is a conservative estimate; actual wastewater processing requirements would likely be lower. Remaining capacity, estimated at 6,800 gallons per day, would be available to support any future increased demand on the wastewater treatment system. Additional capacity could potentially be accessed through changes to the aquifer protection permit

conditions, as the treatment system was designed to accommodate up to 125,000 gallons per day (Air Force Civil Engineer Support Agency 2005; Oswald 2005).

The use of commercial portable toilets through an approved licensed contractor would have no impact on Gila Bend AFAF utilities. Waste would be processed by off-installation waste processing facilities and associated utilities infrastructure and would represent a minor source in the context of all other wastes received and processed.

Bottled water would be provided by commercial vendor in lieu of drinking water from the on-site water system, which does not support potable water. Estimated consumption would be one gallon per person per day or approximately 5,000 gallons per year. A commercial vendor already supplies drinking water for the current Gila Bend AFAF personnel; water supply quantities would increase but there would be no need to establish new service.

In addition, communications infrastructure may be installed at the training sites (e.g., local area network, telephone, and for the operation of land mobile radios). Aside from the potential for service interruptions during site preparation, this would not be expected to affect existing communications infrastructure at Gila Bend AFAF.

Alternative B – No-Action Alternative

There would be no impact on utilities should the no-action alternative be selected.

4.4 NOISE

4.4.1 Alternative A – Proposed Action

There would be intermittent increases in the Gila Bend AFAF noise environment as a result of the proposed expeditionary training. The operation of aircraft, particularly take-offs and landings at the Gila Bend AFAF rather than at Luke AFB, Davis-Monthan AFB, Tucson International Airport, and WAATS during AEF would be the greatest noise source related to implementation of the proposed action. As noted previously, Gila Bend AFAF operations have varied from a low of 22,000 per year and a high of 45,000 operations per year, with an average of about 34,000 operations (Mendez 2005). The estimated 3,120 to 3,600 operations associated with AEF would represent an estimated 10 percent of the average annual operations. Existing noise exposure at the Gila Bend AFAF, as modeled in 2004 under routine active day activities, would be expected to be on an order of magnitude consistent with the noise exposure on an average day of AEF training and well below the noise associated with the highest levels of annual operation (45,000 operations). Therefore, noise exposure levels at and near Gila Bend AFAF would not be expected to change significantly as a result of the proposed action. Similarly, the noise levels at Luke AFB and other regional installations (e.g., WAATS, Davis Monthan AFB, and Tucson International Airport) would not be expected to change appreciably as a result in the change in venue for AEF training under the proposed action.

At Luke AFB, for example, approximately 40,000 operations are conducted annually (Arizona Department of Commerce 2003).

Noise from aviation operations at the BMGR East would not differ from those of existing conditions as the number and types of aircraft operations and munitions delivery would not differ from existing operations originating from Luke AFB, Davis-Monthan AFB, and WAATS.

Other noise generated from the operation of ground vehicles and other ground equipment and human activity in the vicinity of the billeting and operations training areas as a result of AEF and ETT would be noticeable, but would not reach thresholds of concern. Noise levels would be compatible with existing and ongoing land uses at Gila Bend AFAF and the select areas of BMGR East to be used in ground training.

4.4.2 Alternative B – No Action Alternative

The selection of the no-action alternative would not result in any impacts to the existing noise environment at Gila Bend AFAF or the installations that may participate in AEF training at Gila Bend AFAF. The number of aircraft sorties that would continue to be generated at Luke AFB and other regional installations (e.g., Davis-Monthan AFB and WAATS) as a result of AEF training represent a small percentage of total operations at these installations. Noise levels at these installations would not change with implementation of the no-action alternative.

4.5 PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

4.5.1 Alternative A – Proposed Action

The proposed action would not result in any public health or safety impacts, including those related to Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*, which addresses children's greater susceptibility to health and safety risks compared to adults.

The introduction of AEF and ETT training would introduce a new activity at Gila Bend AFAF with associated occupational health and safety risks such as those involved with the use of various vehicles and equipment, use of tools and materials, and exposure to the elements. These risks are managed by Air Force programs that ensure compliance with applicable U.S. Department of Labor, Occupational Safety and Health Administration regulations, Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees* and DoD Instruction 2000.16, *DoD Anti-terrorism Standards*. Related military instructions and regulations potentially applicable to the proposed action include DoD and Air Force instructions and policies addressing traffic safety, occupational and environmental safety, fire prevention and protection, occupational health, hazardous material emergency planning and response compliance, and military shipments of hazardous materials within the defense transportation system. The Luke AFB supplement to AFI 13-212VI, *Space, Missile, Command and Control (Weapons*

Ranges) addresses safety in range operations, including procedures for Gila Bend AFAF (Chapter 8) (U.S. Air Force 2000). In addition, anti-terrorism and force protection requirements would be met with the set-backs from streets and the potential use of HESCO brand or similar barriers around the perimeter of the expeditionary training area.

There would be a benefit for the safety of troops receiving more realistic expeditionary training. The DoD policy to train under conditions that simulate combat conditions is a precept to saving troops during combat operations; those who participate in the proposed expeditionary training and are subsequently deployed for active combat would be able to draw from their training experiences at the Gila Bend AFAF and BMGR East.

4.5.2 Alternative B – No Action Alternative

Under the no-action alternative, troops would continue expeditionary training under conditions that less realistically simulate actual combat conditions. This condition is sub-optimal in terms of providing for the type and quality of readiness training experience that could translate into improved safety for troops as they are increasingly employed in expeditionary ground and aviation operations in the global war on terrorism.

4.6 CULTURAL RESOURCES

Cultural resources are subject to review under a number of federal laws and regulations. Section 106 of the NHPA of 1966 (as amended) requires that a federal agency consider the effect of a project on significant cultural resources—those listed or eligible to the NRHP. Only cultural resources determined to be eligible or listed on the NRHP are protected under the NHPA. A proposed action or alternative affects a significant cultural resource when it alters the property's characteristics, including relevant features of the environment or use that qualify it as significant under NRHP criteria. In addition to affecting NRHP listed or eligible resources, a proposed action or alternative could affect traditional resources that are protected under a number of other federal laws and DoD policy.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the importance of the resource; introducing visual or audible elements that are out of character for the period the resource represents (thereby altering the setting); or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the type and location of the proposed action and by determining the exact locations of cultural resources that could be affected. Indirect impacts are those that may occur as a result of the completed project, such as increased vehicular or pedestrian traffic in the vicinity of the resource.

The actions involved with the proposed expeditionary training at Gila Bend AFAF include two recurring training operations and the development of expeditionary facilities to support those programs including the establishment of billeting and operations areas

with associated utilities and maintenance activities. Existing roads on BMGR East would be used for vehicle convoy training. The impact analysis will focus on possible direct effects from erecting AKSSs for operations and billeting at the Gila Bend AFAF. No changes are proposed for the flight training element of AEF within BMGR East airspace and the convoy training within BMGR East would be on existing roads; therefore, these components of the expeditionary training would not affect cultural resources and are not further analyzed.

4.6.1 Alternative A – Proposed Action

Archaeological and Architectural Resources

The entire Gila Bend AFAF has been surveyed for cultural resources yielding a total of 10 NRHP-eligible prehistoric sites. All of these NRHP-eligible prehistoric archaeological sites are located well to the north and east of the current project areas. All 15 of the World War II and 210 of the Cold War era facilities at Gila Bend AFAF have been recorded and none were determined eligible to the NRHP. Therefore, there will be no adverse affect on NRHP-eligible cultural resources as a result of the proposed action.

Traditional Cultural Places

No traditional cultural places are currently known to occur in the area. The 56 RMO has a history of consultation with Native American communities to address concerns and to identify traditional cultural places that may warrant special management practices, and it has initiated consultation with 15 Native American tribes and groups to elicit concerns about any effects from the proposed action. Any traditional cultural places identified would be avoided. Therefore, no significant adverse impacts to traditional cultural places are expected to occur.

State Historic Preservation Office and Tribal Consultation

As noted in Section 3.6.3, the 56 RMO initiated review of this proposed action with the Arizona SHPO and tribes that attach cultural importance to places on BMGR East (pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800, *Protection of Historic Properties*) in letters dated 7 October 2005. The letters included the 56 RMO finding that no historic properties will be affected by the proposed action and requested concurrence with this finding. On 3 November 2005, the Arizona SHPO responded with a concurrence that no historic properties would be affected pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800. On 20 October 2005, the Zuni Tribe also responded with a letter indicating that they had no comments on the possible effects to historic property affected by the proposed action. No other tribes provided a response to the 7 October 2005 letter. Therefore, the outcome of the consultation process was that no new historic properties were identified and concurrence with the 56 RMO finding that no historic properties will be affected by the proposed action. A sample copy of the 56 RMO letter dated 7 October 2005 and the responses received from the Arizona SHPO and the Zuni Tribe are included in Chapter 6.

4.6.2 Alternative B – No Action Alternative

Under the no action alternative, expeditionary training would not be moved to the Gila Bend AFAF and, therefore, there would be no adverse impacts to NRHP-eligible archaeological or architectural resources or to traditional cultural places.

4.7 SOCIOECONOMIC RESOURCES

4.7.1 Alternative A – Proposed Action

The proposed action is not expected to have measurable social or economic consequences on the community of Gila Bend or in the unincorporated area in the vicinity of the Gila Bend AFAF. Personnel deployed to Gila Bend AFAF for training would remain on the installation for the duration of their training, with the exception of convoy training and the potential use of the small arms range in BMGR East. Instructor personnel may purchase services and sundries in the community, but this impact would be diminutive.

There would be Air Force expenditures related to establishment of the expeditionary training areas and recurring DoD expenditures related to the use of these areas. Most of these expenditures would be with DoD contractors such as the AKSSS shelter manufacturer, suppliers (e.g., equipment, food and water, ammunition) and services (e.g., utilities, food services, and waste removal). The direct and induced economic impact of these expenditures would be broadly distributed across various economic sectors, although some regionalization of effects in southern Arizona may be realized. The overall magnitude of this impact would be negligible in context of the greater southern Arizona economy.

The social environment at Gila Bend AFAF would vary notably as surges in population during deployment activities would affect activity levels at the installation. Some on-installation general services, such as dining, would operate under different conditions to accommodate deployments. Because certain existing facilities at the Gila Bend AFAF would be used to support expeditionary training, the permanent personnel working in those facilities may be inconvenienced by the need to share space and equipment. Those who use the family camp facilities would be expected to encounter military operations and activities. This use would be consistent with the visitation to a military installation and some may enjoy the increased level of activity. However, others that prefer the family camp environment during periods of lesser activity at Gila Bend AFAF may chose not to use the family camp facilities while expeditionary training is occurring.

4.7.2 Alternative B – No Action Alternative

No socioeconomic impacts are anticipated with the no-action alternative.

4.8 HAZARDOUS MATERIALS AND WASTES

4.8.1 Alternative A – Proposed Action

The proposed action would result in increases in the use of certain POLs, and the generation of hazardous waste, human waste, and municipal solid waste at Gila Bend AFAF; and the use of some munitions that contain hazardous constituents.

Existing POL facilities would have capacity to accommodate the materials to be used and existing pollution prevention and spill response planning would remain applicable. If a fuel bladder were used in support of AEF training, it would be installed in accordance with Air Force Handbook 10-222, Volume 2 (U.S. Air Force 1986) which requires the bladder be placed on a two-inch bed of sand for uneven surfaces, and protected with continuous berms 4-foot high and 6-foot wide at the base and with protective liners inside the bermed areas. Modification of pollution prevention and spill response planning may be necessary to address the fuel bladder. Low volumes of hazardous waste may be generated during aircraft maintenance or medical training activities (e.g., POLs, solvents, cleaners, adhesives, etc.) and would be disposed of in accordance with existing programs in place at Gila Bend AFAF and all applicable regulations. One to two extra fuel trucks would be needed to support flying operations during AEF training (Jenssen 2005).

Human waste would be managed via connection to the existing wastewater treatment system or via a commercial contractor licensed for proper handling, transport, and disposal of such waste at an off-installation site.

Solid waste generated during expeditionary training would be collected and transported off-installation by a licensed contractor for proper disposal in a permitted solid waste landfill. This is consistent with existing solid waste collection and disposal procedures at the Gila Bend AFAF. Additional containment would be provided, as necessary, to accommodate the additional waste volume that would be generated during the expeditionary training events.

During convoy operations in BMGR East, personnel would abide by the “leave no trace” principals; all municipal waste would be contained and disposed of in receptacles at Gila Bend AFAF. Wastes at the small arms range would be managed under existing programs; increases in waste volumes due to weapons familiarization training would be minimal and consistent with waste handling during the normal operation of the facility.

Convoy training operations would include the use of smoke grenades, GBSs, and blank small arms ammunition to simulate threats to the convoy. Hazardous constituents that are associated with these munitions (e.g., propellants, pyrotechnic materials, and explosives) would be consumed upon full detonation or deflagration and there would be no discernable residual on the ground surface. Dud munitions that do not detonate or that burn incompletely would be retrieved or referred to EOD crews to remove. The infrequent and dispersed use of these munitions together with the procedures for handling dud munitions would prevent or minimize potential contamination to surface soils and

water. In addition, the areas of BMGR East that are proposed for convoy training use are closed to public use; thus, there would be no added risks to public health and safety.

4.8.2 Alternative B – No Action Alternative

Under the no action alternative, hazardous materials used and wastes generated during existing expeditionary training at Luke AFB and other regional installations (e.g., Davis-Monthan AFB and WAATS) would continue to be managed at these installations rather than at Gila Bend AFAF. Given the relative scale of the training that can be accomplished at these installations versus at Gila Bend AFAF, these wastes would be at somewhat lower volumes than those under the proposed action.

4.9 EARTH RESOURCES

Potential adverse effects to soils could result from ground disturbance leading to soil erosion, fugitive dust propagation, sedimentation, and exposure to pollutants such as hazardous materials and/or waste. Effects to soils are most likely to occur from development of the expeditionary operations and billeting areas, although effects due to expeditionary training activities after these areas are established also are considered.

4.9.1 Alternative A – Proposed Action

Earth resources affected by the proposed action would relate primarily to initial short-term ground disturbing activities within the proposed expeditionary training and billeting areas, including pouring up to 29 concrete pads for AKSSSs; establishing utilities at each shelter; filling HESCO barriers, if used, as a force protection strategy; and creating berms for a fuel bladder storage area, if used. In addition, earth resources may be affected in limited areas as a result of AEF and ETT equipment maintenance. Negligible impacts could also result from ETT convoy training from the increased use of certain existing roads within BMGR East and from the munitions used to simulate threats to the convoys. There would be no additional impacts to earth resources associated with AEF flight training in BMGR East as the number and types of training activities and munitions used in these areas would not change with development of the expeditionary training areas at Gila Bend AFAF.

Activities associated with development of the proposed expeditionary training and billeting areas would disturb greater than one acre of ground, and are thus subject to conditions of the NPDES program, administered in Arizona by the ADEQ under the AZPDES program. Prior to ground disturbing activities, such as preparing a level and stable surface for AKSSS concrete pads or trenching for utilities, either a Permit Waiver Certification would be obtained (if the project qualifies) or an AZPDES Stormwater NOI form under the Arizona Construction General Permit (AZPDES permit, permit number AZG2003-001) would be submitted to the ADEQ. If an NOI is required, a project-specific Construction storm water pollution prevention plan (SWPPP) would be prepared as part of the AZPDES program. Some of the components required in the SWPPP include a project description, changes to existing contours and drainage patterns, best

management practices (BMPs) including soil stabilization efforts and locations, detailed drawings, and a timeline or development schedule.

During development of the operations and billeting areas, spill prevention and response measures described in the SWPPP would be followed to prevent and/or minimize spills/releases of hazardous materials from construction equipment onto ground surfaces or the adjacent stormwater collection system at Gila Bend AFAF. If HESCO barriers are used, filling them would not result in the addition of contaminated soils to the areas as the fill would come from authorized sources outside of the BMGR. Since the soil erosion hazard is slight and the affected area is relatively flat, no problems with erosion are anticipated. The 82-foot setback of the AKSSSs from the roadways would minimize the potential for disturbed soils to wash onto roadways during storm events, where transport of sediments tends to be more severe due to the roadway curbing, slope, and impermeable pavement surface. The arid climate found at the BMGR also would further minimize the potential for water erosion impacts. Erosion from wind and water could result in sedimentation in the Gila Bend AFAF stormwater system and the ephemeral Quilotosa Wash. Wind erosion could result in fugitive dust and air quality impacts (see Section 4.11). However, the AZPDES permit would require regular inspection and implementation of BMPs, such as site stabilization and use of sediment traps or gravel barriers to contain stormwater runoff and minimize soil erosion. Fugitive dust would be reduced during ground disturbing activities through techniques that may include soil watering, placing gravel over fine soils, and proper grading, as discussed in Section 4.11, Air Quality. This standard set of measures would help minimize potential effects to earth resources from development activities associated with the proposed action, resulting in potential for short-term, minor adverse – but not significant – effects to soils.

Post-development operations most likely to result in impacts to earth resources include equipment maintenance activities associated with AEF and ATT training. Soil contamination could result from POL spills and leaks during maintenance activities performed in the AKSSS units designated for such activities. The proposed concrete floors, as well as implementation of spill prevention control and countermeasure (SPCC) plans (and modification of the SPCC plan to account for the fuel bladder, if used) and hazardous material handling and disposal practices would minimize the potential for soil contamination from such spills. Aircraft and other equipment maintenance activities currently occur on the flightline. Additional maintenance activities associated with AEF training would be subject to existing BMPs, plans, and protocols for such activities. Thus, the potential for adverse impacts to soils as a result of maintenance activities associated with the proposed action would be minimal.

Some earth disturbance could occur from convoy training activities, which would be conducted on existing dirt roads within BMGR East and could occur up to 50 days per year. This additional vehicle travel (estimated at three to five vehicles per convoy operation) could result in potential erosion and fugitive dust emissions from disturbance to soils in the roadbeds. Vehicles also have the potential to leak or spill POLs and coolants onto the soils, which could contribute to potential soil contamination. Routine maintenance and adherence to spill response protocols and erosion control BMPs would

minimize potential effects to soils from erosion and contamination from spills or leaks, resulting in temporary, negligible potential effects from expeditionary training vehicle operations.

As noted in Section 4.8, no discernable soil contamination associated with the munitions used for convoy training is anticipated.

4.9.2 Alternative B – No Action Alternative

Under the no-action alternative, proposed expeditionary training areas would not be developed, but remain as they now exist. No additional impacts to earth resources would occur.

4.10 WATER RESOURCES

Adverse effects to water resources could result from erosion, runoff, and surface contamination from pollutants such as hazardous materials and/or waste. Impacts to water resources could potentially occur if implementation of the proposed action threatens or damages unique hydrologic characteristics or violates established laws or regulations; however, this is not expected to occur.

Luke AFB's management practices for the BMGR and associated Gila Bend AFAF (including adopting proper unpaved road maintenance practices, following the general NPDES permit, and implementing SWPPPs for land disturbing activities greater than 1 acre in size) would limit sedimentation into streams. Pollution of storm drainages and waterways also would be minimized by spill prevention and countermeasures BMPs, such as secondary containment, drip pans, and spill response training.

4.10.1 Alternative A – Proposed Action

No significant impacts to water resources would result from the implementation of the proposed action. The area proposed for development of expeditionary training and billeting areas is located on nearly level terrain that has been previously disturbed. Development in this area could create potential temporary minor adverse effects to water quality, primarily due to potential sedimentation of the stormwater system as a result of grading and utility trenching activities. The ephemeral Quilotosa Wash System down gradient from the proposed expeditionary operations and billeting areas also could be impacted. However, there would be no obstruction or alteration of this wash in association with the implementation of the proposed action. Runoff could carry some minor increase in suspended sediment load as a result of physical surface disturbance; however, because of the low slopes found in the area and the typically very high infiltration and percolation capacities of the alluvial soils and drainages, impacts would be limited in scope and duration. A minimal quantity of groundwater would be consumed during development of the operations and billeting areas for dust control and would have no discernible effect on groundwater resources. No springs, seeps, or natural or artificial surface water catchments would be affected under this alternative.

Several measures would be taken to minimize adverse effects to water resources. Adherence to applicable Federal and state laws and regulations as well as Air Force policies and guidelines is required and would alleviate impacts to surface and ground water quality. Unless the project qualifies for waiver, an NOI for storm water discharges associated with ground disturbing activities would be submitted to the ADEQ to meet AZPDES Construction General Permit requirements. The Gila Bend AFAF would implement a SPCC plan and its requirements during construction activities to prevent and/or minimize spills/releases from hazardous materials into the stormwater system and waterways. Erosion control BMPs, as discussed in Section 4.8, would be applied as necessary and practicable to minimize potential for deposition of sediments into drainage ways.

The potential increase in sediment in surface water runoff and soil contamination as a result of expeditionary training activities, including equipment maintenance and convoy training, would be minimal to non-existent. Ground disturbance associated with these activities would be nominal. Installation of up to 29 AKSSs and two portable shower and latrine trailers would increase the amount of impervious surface within up to five vacant Gila Bend AFAF lots proposed for such uses by approximately 19,000 square feet total. Increased runoff velocities may result during rain events. However, this is not expected to result in significant effects to sedimentation of the adjacent stormwater collection system or streams. As with other activities, BMPs would be employed to prevent the contamination of surface waters from sediment and POLs. Maintenance activities would be subject to applicable pollution prevention plans and standards described for the use of hazardous materials. Routine maintenance of vehicles used in convoy training would minimize the potential for POL spills. These measures would prevent and/or minimize surface and ground water contamination from possible discharges of pollutants into the environment. Thus, there would be no measurable change in existing impacts to water resources as a result of these activities.

As noted in Section 4.8, no discernable water contamination associated with the munitions used for convoy training is anticipated. Overall, minimal adverse effects to water resources would result from implementation of the proposed action.

4.10.2 Alternative B – No Action Alternative

There would be no change in existing impacts to water resources if the no-action alternative were selected and implemented. Current activities within the Gila Bend AFAF and along roads proposed for convoy training would remain the same.

4.11 AIR QUALITY

4.11.1 Alternative A – Proposed Action

With regard to implementation of the proposed action, short-term air emissions are expected as a result of site preparation activities and long-term emission are expected as a

result of the shift in aviation operations from Luke AFB and other regional installations (i.e., Davis-Monthan AFB and WAATS) to Gila Bend AFAF. Potential emissions were estimated based on the type of equipment to be used and the activities to be conducted under the proposed action. Table 4-1 summarizes the estimated emissions. Actual emissions would be subject to the existing Maricopa County air quality block permit and associated Dust Control Plan, which would implement control measures to reduce dust emissions both during site preparation activities and in subsequent use of the training areas. The maximum annual emissions from the proposed action, including during periods of construction would be well below the *de minimus* thresholds (i.e., 50 tons per year for nitrogen oxides and volatile organic compounds, 70 tons per year for PM₁₀, and 100 tons per year for carbon monoxide) established by the Federal Conformity Rule (40 CFR 93.153). The action would conform to the SIP and would not affect regional air quality.

TABLE 4-1 ESTIMATED ANNUAL EMISSIONS UNDER THE PROPOSED ACTION (IN TONS PER YEAR)					
	Volatile Organic Compounds	Carbon Monoxide	Nitrogen Oxides	Sulfur Dioxide ^c	PM₁₀ ^d
Initial Year ^{a, b}	10.06	45.25	20.36	2.07	4.02
Subsequent Years ^b	10.04	45.19	20.25	2.05	3.87

Notes: a. In emissions calculations for site preparation activities, load factors were estimated from EPA 2004b and emission factors were taken from EPA 2004c and EPA 1991
b. Emission factors for ground expeditionary training operations were from the EMFAC2002 modeling program; the ACAM Version 4.2.2 modeling program was used to estimate emission from air expeditionary training operations.
c. For emission estimate purposes, oxides of sulfur were estimated as sulfur dioxides.
d. All particulate matter was assumed to be PM₁₀ for the purposes of estimating emissions.

The emissions from the initial year of the proposed action include those resulting from earth moving activities associated with site improvements. These activities are estimated to produce small amounts of dust emissions and minimal amounts of combustion emissions from heavy-duty, diesel-powered construction equipment (primarily carbon monoxide and nitrogen oxides, but also small amounts of volatile organic compounds, sulfur dioxide, and particulate matter). These emissions would be highly localized to the expeditionary training sites for billeting and operations.

The greatest source of emissions is from the long-term shift in aircraft operations for AEF training at Gila Bend AFAF rather than at Luke AFB, Davis-Monthan AFB, or WAATS. Emissions from the air operations associated with the proposed AEF training at Gila Bend AFAF were estimated based on a worst case scenario of all 3,600 operations (assuming 90 takeoffs and 90 landings per course and 20 courses per year) being F-16C/D aircraft equipped with the F-100-PW-220 engine. It also assumes quarterly trim tests would be performed at Gila Bend AFAF. Under these assumptions, the aircraft operations associated with the proposed action would produce an estimated 10 tons of volatile organic compounds, 45 tons of carbon monoxide, 20 tons of nitrogen oxides, 2 tons of sulfur dioxide, and 3 tons of PM₁₀ emissions on an annual basis. Considered in context, the increased operations that would potentially occur at Gila Bend AFAF

represent about 10 percent of the ongoing average annual operations at Gila Bend AFAF, which are highly variable (ranging between 22,000 and 45,000 operations per year).

The proposed ongoing ground operations would add minimally to the annual emissions. The use of public roads to transport equipment from these installations to the Gila Bend AFAF and the use of four BMGR East roads for convoy operations would produce minimal amounts of dust and combustion emissions. The use of smoke grenades and GBSs that would be used during convoy training operations on BMGR East would result in emissions such as particulate matter from combustion or deflagration of the devices. Based on the low volume and frequency of use, impacts would be expected to be localized to the convoy training environment and have negligible impacts on overall air quality.

4.11.2 Alternative B – No Action Alternative

Under the no-action alternative, sorties associated with expeditionary training would continue to originate at Luke AFB and other regional installations such as Davis-Monthan AFB and WAATS. Whereas the Gila Bend AFAF area meets all NAAQS, Luke AFB is within a serious non-attainment area for PM₁₀ and 8-hour ozone standards. Therefore, although minor in magnitude, the no-action alternative would potentially have a greater negative impact on air quality than the proposed action in context of regional air quality and compliance with the NAAQS.

4.12 BIOLOGICAL RESOURCES

The proposed action would be implemented in compliance with existing resource management programs on Gila Bend AFAF (Luke AFB 1995) and BMGR (USAF et al. 2005, USFWS 2005a). The proposed action does not require any change to existing land and airspace use, and would be conducted in compliance with the final Legislative Environmental Impact Statement (LEIS) for the renewal of the BMGR land withdrawal (U.S. Air Force 1999) and relevant Biological Opinions that apply to training on BMGR (USFWS 1997; USFWS 2001a; USFWS 2003b).

4.12.1 Alternative A – Proposed Action

Vegetation

All construction associated with the proposed action would take place in previously disturbed or developed areas of Gila Bend AFAF. Vegetation in these areas is absent, or primarily composed of landscape plants or non-native invasive species (Luke AFB 1995). The expeditionary operations locations do not contain native cacti or other sensitive plants.

Ground and convoy training would use existing infrastructure, roadways, and trails within BMGR East and near the Gila Bend AFAF. These roads and trails pass through

microphyllous desert scrub with creosote bush and triangle leaf bursage/burro bush. No roadway or trail improvements would be required with the proposed action.

Quilotosa Wash and riparian drainages harbor sensitive vegetative communities and potential wildlife habitat. A protective buffer of 0.25 mile (400 m) has been recommended to limit development around Quilotosa Wash (Luke AFB 1995). The proposed tent city location falls within approximately 1,000 feet (305 m) of Quilotosa Wash; construction or development as part of the proposed action would be limited to pouring concrete flooring for the tents in an area that has been previously disturbed.

The tent city would be developed on approximately 1.5 acres (0.06 ha) in the southwestern region of Gila Bend AFAF and operational tents would be erected near the aircraft operations area on approximately 0.5 acres (0.2 ha). Burro bush and weedy vegetation in and around the tent city area location would be disturbed by the facilities, foot traffic, and construction. Soil compaction, coupled with the disturbance in plant life, may lead to soil erosion and sedimentation during rain events, although any erosion would be expected to be minimal because the soil types at the Gila Bend AFAF are not prone to wind or water erosion. Plant communities in the vicinity may be negatively affected by sedimentation (Luke AFB 1997). The Gila Bend AFAF Maricopa County Department of Environmental Services, Air Quality Division earthmoving permit would require an approved Dust Management Plan that would address measures to minimize soil disturbance, erosion, and sedimentation and to provide stabilization and revegetation of the temporarily disturbed sites. Such actions would minimize the potential for soil erosion and sedimentation down slope in the Quilotosa Wash; impacts would be temporary, minor, and would not adversely affect vegetative resources.

In the landscaped area of Gila Bend AFAF, saguaro cacti were planted, and some native saguaros are present (Luke AFB1995). The proposed action does not involve the construction of new buildings or the clearing of any land aside from the concrete pads for AKSSs, which would take place in disturbed areas. It is not expected that saguaro cacti or large native plants would be impacted by the development of the tent city or the operations area. The Air Force cooperates with the Arizona Department of Agriculture to salvage saguaro cacti and other native plants in the event that their removal is necessary (Luke AFB 1995).

Impacts to vegetation would be negligible because the areas proposed for training capabilities are isolated in previously disturbed areas of Gila Bend AFAF where virtually no vegetation is currently growing. The potential for negative effects downstream could be minimized by allowing natural revegetation of areas around the tent city and operations areas. The loss of the minimal vegetation on small segments (2 acres [0.08 ha]) of previously disturbed land would be a minor impact from regional perspective. Creosote bush-bursage vegetation is common in the region; the loss of small areas bordering the proposed action locations would be of only minor consequence.

Mitigation: Significant impacts would not occur; therefore no mitigation measures would be implemented.

Wildlife

Animal species that inhabit the disturbed and landscaped vegetation in the project area may be displaced by establishing the tent city and operation area as well as by the associated human activity in the area for expeditionary training.

Several species of birds nest in non-native vegetation at the Gila Bend AFAF. Some nesting habitat for regionally common species such as the black-throated sparrow and lesser nighthawk, which nest in creosote bush-bursage flats, may become less desirable because of the human activity in the area. There are no large trees or potential nesting sites for raptors in the tent city and operations area locations. Birds disturbed by the human activity in the area would likely relocate to suitable habitat elsewhere in and around Gila Bend AFAF.

Burrowing rodents that are likely to occupy the proposed tent city location would be impacted. Species that are tolerant of human presence may be less affected, or may increase in abundance if military personnel keep food on site. Other species and larger mammals would be displaced to similar habitat elsewhere on Gila Bend AFAF. Small carnivores, skunks, fox, and coyote may traverse the developed Gila Bend AFAF but are not likely to reside there. Herpetofauna is limited in the project area, although some specialized species of toads, lizard, and snakes may be present (Luke AFB 2000) and affected by construction and traffic during the proposed action.

Wildlife that may occur along existing roads that would be used for convoy training and around the small arms range would be similar to those at the Gila Bend AFAF. As there is less human activity in these areas, some wildlife may be more common, depending on habitat conditions. In the bajada and xeroriparian wash areas that occur along some of the existing roads that may be used for convoy training, there may be a greater number and diversity of general wildlife species. With the change in venue for AEF and ETT training from Luke AFB to Gila Bend AFAF and the potential for additional operators in the region to use the Gila Bend AFAF for expeditionary training, there would be approximately 3,120 to 3,600 additional operations at Gila Bend AFAF rather than other regional installations. The resultant noise would be on an order of magnitude similar to that which may occur with typical annual fluctuations in use levels at Gila Bend AFAF. Noise exposure areas extend outward from the Gila Bend AFAF airfield and are greatest to the areas northeast and northwest of the airfield, which do not contain high value habitat for general wildlife species. Therefore, wildlife would not be expected to be affected by aircraft noise that may occur as a result of the proposed action.

The overall impact on wildlife would be minor. The project area is located in previously disturbed habitat on Gila Bend AFAF and on a few existing roads and trails through common habitat types within BMGR East. The affected species are widespread through southwestern Arizona and the extent of the impact from development and routine human occupation is relatively small (2 acres [0.08 ha]) compared with the availability of comparable habitat in the immediate vicinity.

Mitigation: Significant impacts would not occur; therefore no mitigation measures would be implemented.

Special Status Species

No special status species are expected to occur on Gila Bend AFAF in the action area (U.S. Air Force et al. 2005). The AKSSSs for billeting and operations would be located in previously disturbed and developed areas; no new native areas would be cleared. ETT would utilize existing facilities in Gila Bend AFAF and roadways in BMGR East near Gila Bend AFAF. The proposed operations would follow guidelines for sensitive habitats and species as established in the BMGR Integrated Natural Resource Management Plan (INRMP) (U.S. Air Force et al. 2003) and the relevant Biological Opinions (USFWS 2005a; USFWS 2003b).

For the same reasons stated for general wildlife, special status wildlife species are not expected to be affected by aircraft noise resulting from the proposed change in venue for AEF-related aircraft take-offs and landings from Luke AFB and other regional installations (e.g., WAATS, Davis-Monthan AFB) to the Gila Bend AFAF.

Sonoran Population of the Desert Tortoise

As noted in Section 3.13, the desert tortoise (Sonoran population) would not be expected to occur at the Gila Bend AFAF, but could potentially occur in bajada areas and rocky slopes that occur along isolated portions of some of the proposed convoy training routes and in the White Hills area west of the small arms range (U.S. Air Force et al. 2005). The potential for expeditionary training proposed in these areas to affect a tortoise is low and would mostly consist of the possibility of encountering a tortoise within an existing roadbed. Requirements for maintaining safe speeds along roadways would reduce the potential for adverse impacts to occur to individual tortoise that may be encountered. Within this context, no adverse impacts to this species are anticipated.

Lesser long-nosed Bat

As noted in Section 3.13, based on known roost sites, the lesser long-nosed bat is unlikely to occur within most of the area of potential effect. A portion of the convoy training route leading to Manned Range 4 is within the outlying potential foraging area for bats that roost within the Cabeza Prieta National Wildlife Refuge. This species prefers to forage in locations that support dense stands of saguaro and/or agaves (*Agave* spp.) (Cockrum and Petryszyn 1991), which do not occur along the subject section of the convoy roads. Even if new roost sites for this species were identified in closer proximity to the area of potential effect, it is unlikely that this species would be considered more than an unusual and unexpected visitor to the area given the lack of dense stands of saguaros and/or agaves. The lesser long-nosed bat would not be impacted.

California Leaf-nosed Bat

California leaf-nosed bats could potentially forage in natural plant communities (i.e., desertscrub) of the area of potential effect, but are unlikely to use most of the area that would be affected by the proposed action because the Gila Bend AFAF it is at least 10 miles (16 km) from suitable roosting habitat (Hoffmeister 1986; Luke AFB 1997) in the Sand Tank Mountains to the east and a similar distance to the Saucedo Mountains to the south. Although some of roads that would potentially be used in convoy training and the small arms area are more likely to be used by foraging California leaf-nosed bats, it would be unlikely that training activities would impact the bats since the bat forages at night and most convoy/small arms range training would occur during daylight hours.

Southern Yellow Bat

As noted in Section 3.12, it is unlikely that this species would be found in the affected area due to the lack of suitable roosting habitat in the vicinity. The species would not be affected.

Sonoran Pronghorn

Although the Sonoran pronghorn occupies land on BMGR, Gila Bend AFAF and the roads within BMGR-East proposed for convoy training are located northeast of the present distribution of this federally listed endangered species (see Figure 3-2). Based on the present distribution of the Sonoran pronghorn, the species would not be found in the vicinity of the proposed convoy routes or Gila Bend AFAF and would not be affected by the proposed action.

Ground activities, sorties and helicopter flights associated with the proposed action would be consistent with existing military operations at the BMGR and would remain in conformance with Biological Opinions issued by USFWS specifying measures to minimize impacts on Sonoran pronghorn (USFWS 1997; USFWS 2001a; USFWS 2003b, USFWS 2003c, USFWS 2003d, USFWS 2005a). Conservation and avoidance measures required by these Biological Opinions include monitoring, confining vehicle activity to existing roads, maintaining low speed limits along roads, and briefing all BMGR military users regarding the status and protection of the Sonoran pronghorn. Given that the effects of ongoing military operations on the BMGR have been previously addressed (U.S. Air Force 1999; USFWS 1997; USFWS 2001a; USFWS 2003b; USFWS 2003c; USFWS 2003d; USFWS 2005a) and the proposed action would not introduce new activity within the current distribution of the Sonoran pronghorn, the proposed action would not effect on this subspecies.

Cactus Ferruginous Pygmy-owl

Based on the known distribution of this species in southwest Arizona and observations, it is unlikely to occur in the proposed project area (Millsap and Johnson 1988). Although habitat characteristics for the species are present in xeroriparian areas, which occur in the

vicinity of Quilotosa Wash and along smaller washes near the proposed convoy training routes, no owls have been detected during owl surveys conducted on the BMGR, which have been ongoing since 1992 (Luke AFB 1997; U.S. Air Force et al. 2005). The species would not be affected by the proposed action.

Mitigation: Significant impacts would not occur; therefore no mitigation measures would be implemented.

4.12.2 Alternative B – No Action Alternative

Under the no-action alternative, expeditionary training would not occur at Gila Bend AFAF. ETT and AEF would continue to occur at Luke AFB. Other regional military installations that have expressed interest in using expeditionary training capabilities at Gila Bend AFAF, should they be developed, would continue to conduct their training at their respective installation facilities. There would be no impacts to biological resources at Gila Bend AFAF under the no-action alternative.

4.13 ENVIRONMENTAL JUSTICE

There would be no disproportionate adverse impacts to minority or low income populations as a result of implementation of the proposed action or no-action alternative. Consequently, there are no environmental justice effects with either the proposed action or the no-action alternative.

4.14 OTHER ENVIRONMENTAL CONSEQUENCES

In addition to the environmental impacts identified in the preceding sections, 40 CFR 1502.16 requires that the analysis of environmental consequences include a discussion of any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved by implementing the proposal.

4.14.1 Unavoidable Adverse Environmental Effects

Adverse impacts that could not be avoided should the proposed action be implemented include the following:

- A low amount of emissions of criteria pollutants would occur even after the application of control measures called for in the Dust Control Plan.
- The renewed disturbance of the expeditionary training sites at the Gila Bend AFAF would have localized minor unavoidable adverse impacts to soils and the limited vegetation and wildlife that are present at the site.
- Low levels of noise would result from the proposed expeditionary training activities, but would not impact land use compatibility.

- There would be increased occupational health and safety risks that would be mitigated by programs in place to minimize, if not eliminate, the associated risks.
- There would be increased use of hazardous materials and increased production of solid, human, and hazardous waste at Gila Bend AFAF. Such materials and wastes would be managed in accordance with laws and regulations to protect the environment from adverse environmental effects.

4.14.2 Relationship Between Short-term Uses and Long-Term Productivity

The majority of area of potential effect has been previously disturbed. As the proposed action considers renewed disturbance to the billeting and operational expeditionary training areas at Gila Bend AFAF (and not the convoy training roads or small arms range, which have been actively used in ongoing training and operations activities), these areas are the focus of this discussion. The renewed disturbance that would occur under the proposed action would arrest any natural recovery of the area that has occurred since it was last actively used. Although some recovery has occurred since the active use of the areas was discontinued (i.e., late 1990s for the former housing area), the areas do not actively serve as a productive role in the natural environment. They remain largely unvegetated and provide little habitat for animals, particularly in context of the surrounding area. In the long term, should use of the areas discontinue, the natural recovery of the area would be expected to be slow. The area, however, would eventually be expected to be revegetated, beginning with common grass and shrubs species and eventually supporting vegetation that occurs in the vicinity. If management actions that the Air Force has taken to reduce the spread of non-native and invasive species are successful, the area would be expected to support mostly native vegetation and wildlife common in the creosote-bursage desert scrub flats. The creosote-bursage desert scrub flats have low productivity due to its typically sparse to moderately dense layers of subshrubs and shrubs less than two meters tall. This supports common reptile and burrowing small mammals. Most productivity in this environment is correlated with xeroriparian systems (i.e., although xeroriparian washes account for less than five percent of the Lower Colorado River Valley Subdivision of the Sonoran Desert, they support 90 percent of its bird species [Phillips and Comus 2000]), such as Quilotosa Wash, which is located southwest of the proposed billeting and operational expeditionary training area.

4.14.3 Irreversible or Irretrievable Commitment of Resources

Irreversible commitment of resources refers to resources committed or consumed by the proposed action that will be committed or consumed throughout the life of the project. This has been interpreted to mean that those resources used, consumed, destroyed, or degraded during establishment, operation, or maintenance of the proposed project could not be retrieved or replaced for the life of the project or beyond. Foreseeable irreversible/irretrievable commitment of resources includes the following:

- use of the land committed to expeditionary training would be unavailable for other land uses, and future land uses would be required to consider compatibility with the proposed action for as long as the proposed expeditionary training is conducted at Gila Bend AFAF

- loss of (the very limited) existing common vegetation and wildlife habitat cleared from the proposed locations for the expeditionary training areas
- wear and tear and reduction in the operational life of tools and equipment used in support of the proposed action
- materials and manpower used to establish the expeditionary training areas such as concrete pads, AKSSs, HESCO brand or similar barriers, utilities infrastructure, and lighting materials (although some of these materials may have a useful life beyond their proposed use for expeditionary training at Gila Bend AFAF)
- energy, water, food, supplies, munitions, and POLs consumed in the site preparation activities and ongoing training activities
- use of landfill capacity in disposal of municipal solid wastes and hazardous waste disposal capacity in whatever approved means of disposal are used

4.15 CUMULATIVE IMPACTS

Cumulative effects are those additive or interactive effects that would result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR § 1508.7). Interactive effects may be either countervailing—where the net cumulative effect is less than the sum of the individual effects—or synergistic—where the net cumulative effect is greater than the sum of the individual effects. The CEQ handbook for considering cumulative effects advises that focusing the cumulative effects analysis on meaningful cumulative impact issues, rather than on all conceivable impact relationships, is critical to the success of this analysis to support better decisions about the proposed action and alternatives (CEQ 1997).

In accordance with this handbook, the potential cumulative effects of the proposed action and no action are analyzed in terms of the specific resources, ecosystem, and human community that may be affected. The analysis considers how cumulative effects may be manifested over short and long time frames and how they may cause meaningful impacts that extend over areas that may exceed political or administrative boundaries. Each affected resource, ecosystem, and human community is analyzed in terms of its own capacity to accommodate additional effects, based on its own time and space parameters. First, actions that may have cumulative effects are described in general terms, followed by an assessment of the specific environmental resources likely to be affected.

4.15.1 Potential Cumulative Effects Issues

Present Effects of Past Actions

The CEQ has provided additional guidance on the consideration of past actions stating that the review of past actions is required to the extent that this review informs agency decisionmaking regarding the proposed action. In accordance with this guidance, present effects of past actions are described to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the proposed action and

alternatives may have a continuing, additive, and significant relationship to those effects. Experience with and information about past direct and indirect effects of individual past actions may be useful in illuminating or predicting the direct and indirect effects of the proposed action, but have no cumulative relationship with the proposed action (CEQ 2005).

The present effects of past actions in the area of potential effect are dominated by the establishment and use of the BMGR and Gila Bend AFAF to support military training. The BMGR was established through a series of contiguous land withdrawals in 1941, 1942, and 1943. The Gila Bend AFAF was established around this same time, beginning with three runways that ran north-south, east-west, and northeast-southwest. Over the years, the installation evolved into a self-sustaining auxiliary airfield with residential, commercial, and community support facilities, in addition to the operational facilities of the airfield. In October 1994, the Air Force closed most of the facility, removed the active military personnel, and transferred the management and maintenance of the facility to a civilian contractor. Most of the family housing and community support facilities that were used by military personnel were demolished. A civilian contractor has been retained to manage and maintain the airfield, including taxiways, aircraft aprons, an aircraft hangar, and other facilities and equipment directly related to the support of the training and maintenance functions (Luke AFB 2005).

The other past actions of note are those of the development of the community of Gila Bend and associated infrastructure such as the State Route 85 transportation and utility corridor. The compounding development within the region has had an assortment of impacts on the natural environment, including increased air emissions, drawdown of groundwater resources, alteration and disturbance to natural drainage, elimination and modification of natural vegetative communities, and extirpation of species from former habitat.

Ongoing Operations at Gila Bend AFAF

For the foreseeable future, Gila Bend AFAF will continue to operate in support of Luke AFB, Davis-Monthan AFB, Arizona Air National Guard, WAATS, the 1-285 Attack Helicopter Battalion, and other BMGR users. Gila Bend AFAF will also continue to support aviation operations for other U.S. governmental law enforcement agencies (Luke AFB 2005). Uses and activities in support of these operations (i.e., runway maintenance, security patrols) will continue to have some level of direct and indirect effect on all environmental resources. The most notable of these effects are as follows:

- support of airspace and range operations and the military mission (see Section 3.1)
- existing and future land use, which would continue to be principally dedicated to the military mission as long as current function of the Gila Bend AFAF continues (see Section 3.2)
- continued use and necessary upgrades to ground transportation and utilities (see Section 3.3)

- noise from continued operations (particularly from aircraft operations) (see Section 3.4)
- risks associated within use of the Gila Bend AFAF to the public and occupational safety and health environment (see Section 3.5)
- socioeconomic impacts from the direct employment of military and contractor personnel and indirect economic and social effects on the surrounding community
- impacts to natural resource (earth, water, air, biological resources) affected by current and ongoing uses (see Sections 3.9, 3.10, 3.11, and 3.12, respectively)

Proposed Facility Improvements Projects at Gila Bend AFAF

Some facility improvements projects have been proposed at Gila Bend AFAF for implementation in the foreseeable future. These include:

- Installing a fence at Building 35, Refueling Vehicle Parking Area. This would include a six-foot high chain-linked fence approximately 300 foot by 100 foot at and around Facility 330.
- Repairing asphalt aircraft ramp and turnarounds with concrete to reduce overall risk posed by foreign objects, which are detected in high numbers due the condition of the parking ramp and engine run-up area. These two movement areas are where the majority of ground operations occur whenever an aircraft diverts to Gila Bend AFAF (Brownlow and Sizemore 2005).
- Upgrading electrical hook-ups at 32 family camping spaces and adding picnic areas at the family camp area (Brownlow and Sizemore 2005).
- Improving anti-terrorism/force protection through several projects that include removing telephone poles from the airfield clear zone, upgrading the alarm system at the MSA, and installing security upgrades at the main gate (Brownlow and Sizemore 2005).
- Constructing a taxiway parallel to and west of the existing runway so that aircraft no longer need to use the runway to taxi into position for taking off; this would improve airfield safety (Brownlow and Sizemore 2005).
- Demolishing the existing air traffic control tower to accommodate the anticipated parallel taxiway and constructing a new tower to control aircraft movement (Brownlow and Sizemore 2005).
- Replacing a diesel tank with the installation of a new 8,000-gallon self-contained aboveground storage tank for storage of diesel fuel (DF-2) at the existing Base Service Station to meet Federal and State environmental regulatory agency requirements (McCarrick 2005).

Ongoing Operations at BMGR East

The BMGR will continue to be used for the purposes for which it was withdrawn (see Section 3.2). Such uses include aircrew training and corresponding ground use related to the operations and maintenance of the manned and tactical ranges used in aircrew training. The auxiliary airfields, target simulations, manned range facilities, EOD cleanup areas, electronic equipment sites, and supporting road network are among the uses that result in ground disturbance. A cumulative estimate of 16 percent of the BMGR

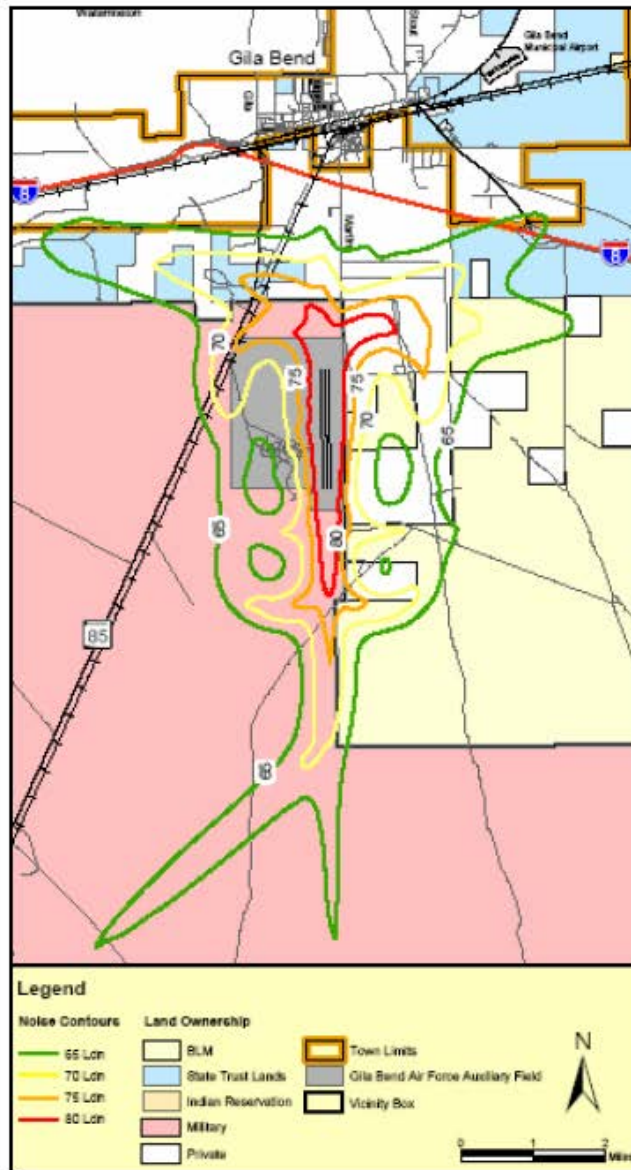
ground surface has been disturbed by past (4 percent) or ongoing (12 percent) uses. Most levels of disturbance are negligible (6 percent) or low to moderate (7 percent); 3 percent is moderate to complete disturbance (U.S. Air Force et al. 2005). The Legislative EIS for the Renewal of the BMGR Land Withdrawal (U.S. Air Force 1999) details the environmental impacts of ongoing use of the BMGR for military purposes.

Next Generation Aircraft

Although basing decisions for next generation aircraft that may operate in the region and at Gila Bend AFAF have not yet been made, the most probable successor aircraft to the aircraft most commonly operating at Gila Bend AFAF (the F-16 and A-10) is the F-35. The greatest potential impact of the transition from the F-16 to the F-35 would be noise. Noise modeling has not yet been developed for the F-35; therefore, an accurate prediction of specific future noise contours for the successor aircraft is not possible. Preliminary noise data indicates that the F-35 may be noisier than the current F-16 or A-10. To provide a reasonable approximation of future noise exposure, a 2004 study evaluated the noise exposure based on operations with the F-18E Super Hornet, which is a single-engine fighter aircraft with a noise signature generally louder than that of the F-16 or A-10. These contours, shown on the page that follows, were developed using standard noise methodology and were based upon the operation of F-18Es using the current flight paths for approaches and departures at Gila Bend AFAF, and the same number of operations used for the current contours. These maps are for illustrative purposes only. The noise signature of the F-35 will likely differ from that of the F-18E and F-35 flight operations will not necessarily mimic the current F-16 and A-10 operations that currently occur at Gila Bend AFAF.

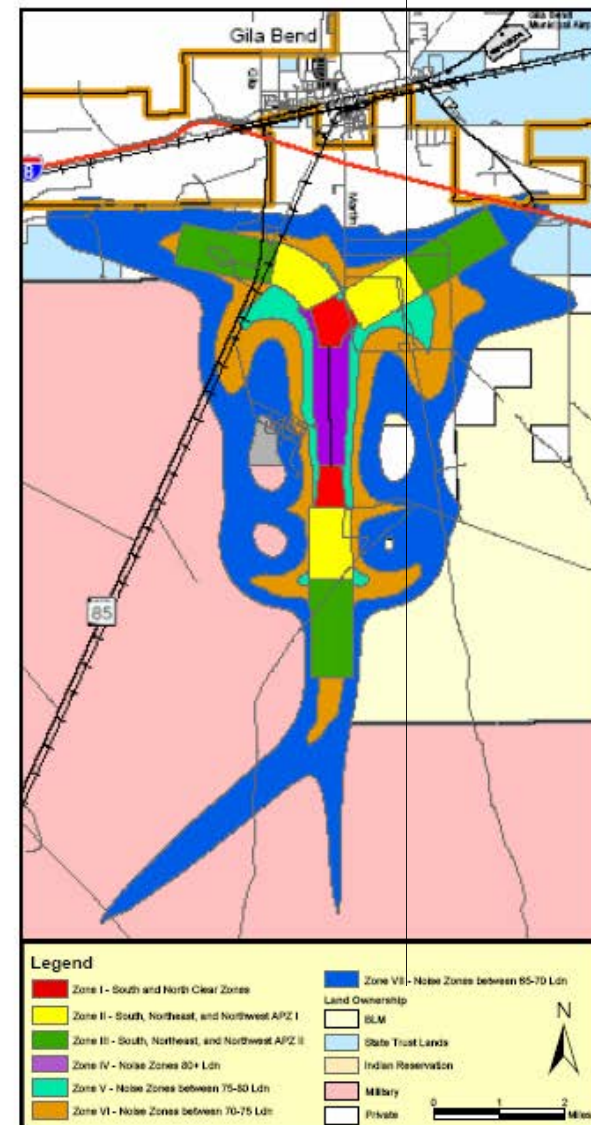
The area contained within the contours for the modeled F-18E operations is shown in the graphic on the page that follows. This area is larger than the area contained within the noise contours for current operations (see Section 3.4). The Joint Land Use Study for the Gila Bend AFAF and BMGR (Arizona Department of Commerce 2005) recommended the use of the F-18E contours to define the noise zones for applying noise compatibility criteria because the F-35 noise signature is likely to be more similar to the F-18E than to the F-16 or A-10.

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR East*



*Gila Bend AFAF Estimated Next Generation Aircraft
Noise Contours*
Source: Arizona Department of Commerce 2005

Final EA



Gila Bend Compatible Land Use Plan
Source: Arizona Department of Commerce 2005

Joint Land Use Study

A Joint Land Use Study for Gila Bend AFAF and the BMGR was prepared under the sponsorship of the Arizona Department of Commerce in February 2005. The Joint Land Use Study is part of the Arizona Military Regional Compatibility Project, which is endeavoring to provide the tools to address land use conflicts that might affect the ability of each base to conduct its mission, and to ensure land use compatibility around active military airports, as required under Title 28, Article 7 of the Arizona Revised Statutes, Airport Zoning and Regulation (Arizona Department of Commerce 2005).

The State of Arizona enacted Growing Smarter and Growing Smarter Plus measures that address growth and land development issues through changes in community planning and rezoning processes. These measures require political jurisdictions with property within territory in the vicinity of a military airport or ancillary military facilities to include consideration of military airport operations in their General Plans and Comprehensive Plans and to allow an opportunity for official comment by the military airport officials on the Plans. In addition to the specific requirements for territory in the vicinity of military airports, the Growing Smarter statute requires that plans provide for a rational pattern of land development and an extensive public participation program. Compliance with these Growing Smarter and Growing Smarter Plus objectives serves as a key guiding principle for the overall Arizona Military Regional Compatibility Project as well as in the preparation of the Joint Land Use Study (Arizona Department of Commerce 2005).

The Compatible Land Use Plan for Gila Bend AFAF, as shown in the graphic on the preceding page, is structured in seven separate zones, incorporating the State-defined Clear Zones and Accident Potential Zones, and noise exposure zones, as listed in the legend of the graphic on the preceding page.

Integrated Natural and Cultural Resource Management Plans for the BMGR

Public Law 106-65 mandated the Air Force, Navy, and Department of the Interior to jointly prepare an INRMP for management of the BMGR. The plan, which is in the final stages of development, describes proposed management of the BMGR to provide for effective conservation, protection, and rehabilitation of natural resources and sustainable public use consistent with the national defense purposes of the BMGR. The proposed plan addresses the management of 17 resource elements. Types and levels of public use, including road management, and management approaches for natural resources is set forth at a programmatic level (U.S. Air Force et al. 2005)

An Integrated Cultural Resources Management Plan and implementing programmatic agreement is also under preparation for the entire BMGR. The plan considers NHPA requirements as well as those of other heritage preservation legislation, with related documents that address treatment of human burials and repository requirements. Additionally, an inventory was conducted to identify traditional cultural places (and sacred sites) of importance to Native American (or other traditional communities) with ties to the BMGR. This was a major ethnographic study involving contacts and

consultation with more than 20 individual Native American communities. The cultural resource management goals of the Integrated Cultural Resources Management Plan were adopted into the Integrated Natural Resources Management Plan (U.S. Air Force et al. 2005).

Special Status Species Actions

Ongoing research and actions relative to other special status species, including Sonoran pronghorn, desert tortoise, lesser long-nosed bat, and cactus ferruginous pygmy owl, are ongoing on the BMGR and in the BMGR vicinity. Of these, the recovery efforts related to the Sonoran pronghorn include various monitoring, research, and active management (e.g., forage enhancement, supplemental water, and captive breeding) within the current distribution of the Sonoran pronghorn, which is to the southeast of the Gila Bend AFAF. Among recent actions is the proposed delisting of the Arizona population of the cactus ferruginous pygmy owl from the endangered species list (Federal Register 148, Pages 44547 – 44552).

4.15.2 Cumulative Effects Associated with Alternative A – Proposed Action

Cumulative impacts that could result with the proposed action and the previously mentioned projects include the following:

Airspace and Range Operations – The proposed action would result in increased airspace and range operations activity at Gila Bend AFAF in support of the expeditionary training. The use is consistent with the existing and foreseeable future need for airspace and range operations capacity at Gila Bend AFAF.

Land Use – There would potentially be cumulative increases in active land uses at Gila Bend AFAF from the proposed action, construction of a new air traffic control tower, various anti-terrorism/force protection projects, and construction of a parallel runway. These uses are consistent with the military purposes of the Gila Bend AFAF, but could preclude other types of future land use in these areas as long as the proposed facilities remain in use.

Ground Transportation and Utilities – The proposed action has the potential to accumulate with existing and proposed uses of ground transportation and utilities infrastructure at the Gila Bend AFAF. Because the infrastructure was designed to support the former installation population of approximately 500 people, capacity would remain available to support additional demand even if the projects identified in Section 4.15.1 were implemented.

Noise – The noise from aircraft operations associated the proposed action has the potential to have aggregate impacts with the transition to next generation aircraft, which could be noisier, as well as other potential improvements to Gila Bend AFAF that could increase annual operations, such as construction of a parallel runway. While the proposed action would remain compatible with existing land uses, the combination of the

proposed action with future foreseeable actions, if implemented, could lead to land use incompatibilities and the need for mitigation measures such as improving noise insulation for buildings with sensitive receptors (e.g., residences, schools) or purchasing affected lands to ensure the ability to control their use. The Joint Land Use Study and implementation of recommendations in the Gila Bend Master Plan Update and planning for unincorporated Maricopa County would have countervailing impacts.

Public and Occupational Health and Safety – There would be an interactive impacts for military personnel health and safety associated with the additive increase in ongoing and future military uses that are inherently risky (e.g., aircraft operations) and the proposed expeditionary training. No net adverse impact is anticipated because all risks are managed through compliance with federal, DoD, and Air Force standards. No cumulative public health and safety impact is foreseen. The antiterrorism/force protection projects, improvements to the tarmac, new aircraft control tower, and a parallel runway would have countervailing impacts in that they would improve safety.

Cultural Resources – No additive impacts to cultural resources in association with the proposed action are anticipated.

Socioeconomic Resources – Benefits realized in the local community from ongoing and future military uses at Gila Bend AFAF and BMGR East would potentially accumulate, but remain minor overall in context of the regional economy. Implementation of the Joint Land Use Study recommendations would reduce the potential for conflicts between airfield and range operations and adjacent off-installation land uses.

Hazardous Materials and Waste – Additive cumulative impacts would result for the use of hazardous materials and increased generation of municipal solid, human, and hazardous waste with existing and potential future use of hazardous materials/generation of waste at Gila Bend AFAF. The ongoing pollution prevention, waste minimization, and spill response programs would have a countervailing impact.

Earth Resources – The proposed action would affect soils within a previously disturbed, but undeveloped area. Other activities involving new or ongoing surface disturbance, including ongoing and future military operations at Gila Bend AFAF, would potentially have additive impacts on earth resources. However, the resultant impact would be minor from both a local and regional perspective, as the vast majority of the BMGR surface remains undisturbed. Management programs could have countervailing impacts.

Water Resources – No cumulative impacts are predicted.

Air Quality – All projects involving construction/development have the potential to create aggregate impacts on air quality air emissions, particularly in fugitive dust. Changes in aircraft using the Gila Bend AFAF, such as replacing the F-16 and A-10 with the F-35, would also affect air emissions although data are not available to quantify the change.

Biological Resources – The minor impacts to biological resource that could occur with the proposed action would be additive to other losses of the relatively common vegetation and wildlife habitat within the creosote-bursage desert scrub habitat type. Ongoing special status species management actions and the integrated natural resource management plan would be expected to have some countervailing impacts.

In summary, the incremental contribution of the environmental effects of the proposed action when considered along with other past, present, and reasonably foreseeable future actions would not have significant impacts on any resource.

4.15.3 Cumulative Effects Associated with Alternative B – No Action Alternative

No cumulative effects were found with the no-action alternative.

4.16 COMPATIBILITY WITH LAND USE PLANS, POLICIES, AND CONTROLS

This section of the EA addresses immediate or potential impact of the proposed action and no-action alternative on the objectives of existing or proposed federal, regional, state, and local land use plans and policies for the area of potential effect. Land use plans include all types of formally adopted documents for land use planning, zoning, and related regulatory requirements. Land use policies include formally adopted land use policy as embodied in laws or regulations. It also includes proposals for action such as the initiation of a planning process or formally adopted policy statements of an executive branch that have not yet been formally adopted by a legislative body. It also addresses whether, or how much, the proposal will impair the effectiveness of land use control mechanisms for the area (CEQ 1981).

There are two local land use plans for lands near the Gila Bend AFAF/BMGR East area of potential effect: the Maricopa County 2020 Comprehensive Plan (adopted in October 1997 and amended in August 2002), and the 1996 Town of Gila Bend Plan (currently being updated). These plans are regulated by various State laws, including the Growing Smarter and Growing Smarter Plus legislation and by Title 28, Article 7 of the Arizona Revised Statutes.

4.16.1 Maricopa County Eye to the Future 2020 Plan

The overriding vision for Maricopa County, defined by the Eye to the Future 2020 Plan, is to accommodate growth in a fashion that will preserve a sense of community and protect and enhance quality of life. Priorities include protecting the unique desert environment, cultural heritage, and Southwestern lifestyle. These unique features are recognized to define the region and provide an identity that is recognizable in the international arena. Recognition and enhancement of these characteristics are considered critical to county's future success (Maricopa County 2004).

The environmental effects element addresses many of the same issues as this EA; it contains analysis, goals, objectives, and policies that address anticipated effects that development may have on air quality, water quality, noise abatement, and sensitive plant and wildlife species.

- Goal 1: Encourage development that considers environmental impacts on air quality, water quality, and sensitive plant and wildlife species, as well as the impacts that noise exposure has on health and quality of life.
- Goal 2: Encourage development that protects, preserves, enhances the use of (where appropriate), and raises the public's appreciation of prehistoric, historic, and archaeological sites, buildings, structures, and objects.
- Goal 3: Encourage development that minimizes environmental hazards.

Associated objectives are as follows:

- Objective E1: To help improve air quality, encourage mixed use development that reduces vehicle miles traveled.
- Objective E2: To help improve water quality, encourage development that minimizes land disturbance to reduce soil erosion and sedimentation in rivers, streams, and washes.
- Objective E3: To help improve water quality, encourage wastewater treatment coordination efforts in newly developing areas.
- Objective E4: Encourage protection and preservation of sensitive plant and wildlife habitat and riparian areas within the framework of state and federal laws, regulations, and guidelines.
- Objective E5: Encourage noise abatement in new development located near noise generating activities, according to federal, state, and local regulations and guidelines.
- Objective E6: Encourage monitoring and evaluation of all sites prior to development for evidence of prehistoric, historic, and significant archaeological sites, buildings, structures, and objects.
- Objective E7: Encourage development that protects air quality, water quality, and water resources; that minimizes soil and waterway disturbance; that mitigates noise problems; and that preserves historic resources (Maricopa County 2004).

These goals and objectives are consistent with the management actions for environmental protection addressed in this EA.

Unincorporated Maricopa County lands in the vicinity of the BMGR are designated as Rural Development Area. Land is designated Rural according to the county land use categories. These areas are typically vacant land or rural in character with minimal, if any, infrastructure or public services. Residential development will be allowed at a very low density, generally not to exceed one house per five acres (Arizona Department of Commerce 2005). The effects of the proposed action and no-action alternative would be almost entirely contained within Gila Bend AFAF and BMGR East. The minor impacts that may affect nearby unincorporated areas (associated noise and air quality emissions) are at levels that are addressed in existing plans.

4.16.2 Town of Gila Bend Master Plan Update

The Town of Gila Bend's Master Plan Update does not specifically address land use compatibility with the BMGR or Gila Bend AFAF. The southerly boundary of the Master Plan area is approximately one mile north of the northern BMGR boundary. The greatest potential for issues of compatibility related to operations at BMGR and Gila Bend AFAF is in the southerly tier of the town's planning area. Planned land use designations in this area, which is south of the Union Pacific rail line, are primarily low density residential (defined as 1 to 5 dwelling units per acre) along with Light Industrial along the rail line (Arizona Department of Commerce 2005).

Gila Bend is in the process of updating its plan. The plan update is expected to address Merrill-Paloma Ranch, a planned 10,000-acre mixed use development located north and south of Interstate 8 about 20 miles west of Gila Bend AFAF. The Development Agreement for the ranch, approved by the Town of Gila Bend in April 2004, includes a Land Use Plan as part of the Master Development Plan for the ranch. The plan calls for a range of housing densities, neighborhood commercial areas, and an open space system. In the area of planned development closest to BMGR, proposed uses include a range of residential uses with target densities from 10 to 16 dwelling units per acre, along with open space areas and areas for general business, neighborhood business, light industrial, mobile home, and recreational vehicle uses (Arizona Department of Commerce 2005).

The proposed action and no-action alternatives would be consistent with this land use plan.

5.0 LIST OF PREPARERS

TEC INC.

Beth Defend Project Management Purpose and Need	BA in Technical Journalism with more than 20 years of experience in environmental planning and NEPA compliance.
Mike Dungan Biological Resources	PhD in Biological Oceanography and 25 years of experience in biological resource assessments in the Southwest.
Lesley Hamilton Air Quality	BA in Chemistry and 17 years of experience in air quality assessment and compliance programs.
James Madden Transportation	BA in Urban Planning and one year of experience in transportation and environmental planning.
Kelly Mitchell Cultural Resources	BA in Anthropology and 10 years of experience as an archaeologist.
Dana Novak Earth Resources Water Resources	BS in Environmental Science and 8 years of experience in environmental planning and environmental compliance programs.
Andrew Raaf Biological Resources	MS in Environmental Science and one year of experience in biological resource studies and impact assessments.
Carol Wirth Land Use, Noise, Utilities Hazardous Materials and Waste, Public Health and Safety, Socio- economics, Cumulative Impacts	BS in Ecology and Environmental Biology and 11 years in experience in environmental planning and assessment.

RESOURCE PERSPECTIVES, INC.

Brock Tunnicliff Description of Proposed Action and Alternatives Airspace/Range Operations	PhD in Natural Resource Management and Planning with 22 years of experience in military environmental management and planning and 27 years of experience in natural resource planning.
---	--

6.0 PERSONS AND AGENCIES CONSULTED

This chapter includes:

- A list of the persons and agencies consulted during preparation of the draft EA
- Comment letters received on the draft EA, which included input from the Arizona Game and Fish Department and the Arizona SHPO; neither of these comment letters requires a response
- A sample of the consultation letter that was sent to the Arizona SHPO and Tribal government leaders pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800, *Protection of Historic Properties*, and responses received from the Arizona SHPO and Zuni Tribe

Federal Contacts

Luke Air Force Base

Cris Brownlow, Base Planner
Chas Buchanan, Chief, Range Operations
Maj. Daniel Garcia, Manager, Environmental Science Management
Carol Heathington, Historic Preservation Officer
Lisa McCarrick, Natural Resources Planner
David Mendez, Range Maintenance/Civil Engineering/Environmental
Eric Oswald, Natural Resources Planner
Francisco Pardieu, Base Programmer
Tim Sizemore, Range Maintenance/Civil Engineering/Environmental
Jim Uken, Director, Range Management Office

State Contacts

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Ann Howard, Archaeologist/Public Programs Manager, State Historic
Preservation Office

Tribal Government

Ak-Chin Indian Community

Terry O. Enos, Chairman
Nancy Nelson, Cultural Resource Manager, Ak-Chin Him Dak Eco Museum &
Archives

Cocopah Tribe

Sherry Cordova, Chairman
Lisa Wanstall, Director, Cocopah Museum

Colorado River Indian Tribes

Daniel Eddy, Jr., Chairman
George Ray, Acting Director, Colorado River Indian Tribal Museum

Fort McDowell Yavapai Nation

Raphael Bear, President

Fort Mohave Indian Tribe

Nora McDowell, Chairman

Linda Otero, AhaMakav Cultural Preservation Office

Fort Yuma-Quechan Tribe

Mike Jackson, Sr., President

Gila River Indian Community

Richard Narcia, Governor

Barnaby Lewis, Cultural Resource Specialist, Cultural Resources Management
Program

Hia C-ed O'odham Alliance

Lorraine Eiler, President

Hopi Tribe

Wayne Taylor, Jr., Chairman

Leigh Kuwanwisiwma, Director, Hopi Cultural Preservation Office

Pascua Yaqui Tribe of Arizona

Herminia Frias, Chairman

Amalia A.M. Reyes, Language and Culture Preservation Specialist

Salt River Pima-Maricopa Indian Community

Joni Ramos, President

Dezbah Hatathli, Cultural Preservation Program Supervisor, Cultural &
Environmental Services

San Carlos Apache Tribe

Kathleen Wesley Kitcheyan, Chairman

Vernelda J. Grant, Tribal Archaeologist, Historic Preservation and Archaeology
Department

Tohono O'odham Nation

Vivian Juan-Saunders, Chairman

Peter L. Steere, Project Manager, Cultural Affairs Department

Joseph T. Joaquin, Cultural Affairs Specialist, Cultural Affairs Department

Yavapai-Apache Nation

Jamie Fullmer, Chairman

Christopher Coder, Archaeologist, Cultural Resources

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*

Yavapai-Prescott Indian Tribe

Ernest Jones, Sr., President

Nancy Lee Hayden, Director of Research, Cultural Research Committee

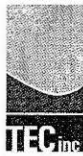
Pueblo of Zuni

Arlen P. Quetawki, Sr., Governor

Jonathan Damp, Preservation Coordinator, Zuni Cultural Resources Enterprise
Office

Comments Received on the Draft Environmental Assessment

SAPD- 2005 - 2242 (25893) GC



502 S. College Avenue, Suite 205
Tempe, Arizona 85281
(480) 736-3976 • fax (480) 736-3977

Ann Howard
Archaeologist/Public Programs Manager
State Historic Preservation Office
1300 West Washington
Phoenix AZ 85007

14 October 2005

RECEIVED

OCT 17 2005
AH 10/21/05
AIR FORCE HISTORICAL CENTER

Re: Draft Environmental Assessment for Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field (AFAF) and Barry M. Goldwater Range (BMGR) East

Dear Ms. Howard:

In response to a new emphasis on training in increasingly relevant expeditionary combat skills, the Air Force proposes to (1) implement two recurring, pre-deployment expeditionary training programs at Gila Bend AFAF: Air Expeditionary Force (AEF) training and Expeditionary Thunderbolt Training (ETT) and (2) develop training capabilities at Gila Bend AFAF to support these programs. The 56th Fighter Wing currently conducts expeditionary training at Luke Air Force Base (AFB) with flight operations at BMGR East, but the Air Force proposes to relocate the training to the more remote and austere environment available at the Gila Bend AFAF. It is anticipated that other BMGR users, such as Davis-Monthan AFB and the Army National Guard, would use the training facilities if they were established at the Gila Bend AFAF.

The AEF training deployments would last one week, occur up to 20 times per year, involve 10-12 aircraft and up to 120 people, and would relocate up to 1,560 take-off and landing operations to Gila Bend AFAF from the installations from which they currently originate. ETT deployments would last three days, occur up to 50 times per year, involve approximately 30 to 50 people, and principally be limited to training at Gila Bend AFAF. Two new expeditionary training areas are proposed at previously disturbed sites at Gila Bend AFAF: an operations area near the flight line and an expeditionary billeting area at a site that formerly supported family housing. Aluminum framed tents and associated infrastructure would be erected at these sites, and some existing support facilities and services would be used in support of the proposed training. The no-action alternative is to continue to conduct expeditionary training in the manner that it currently occurs today, at installations that less accurately represent expected combat deployment conditions.

On behalf of the Air Force, I have enclosed a copy of the draft Environmental Assessment (EA). This draft EA was prepared in accordance with the National Environmental Policy Act and its implementing regulations, the Air Force's Environmental Impact Analysis Process promulgated in Title 32 of the Code of Federal Regulations Part 989, and all other applicable state and local regulations. Any comments on the draft EA must be submitted by November 16, 2005 to be fully considered in the development of the final EA.

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*

Comments should be directed to Beth Defend at the above. Questions may be directed to Lisa McCarrick, Environmental Planner, 56th Range Management Office, at 623-856-9475 or lisa.mccarrick@luke.af.mil.

Sincerely,

Beth Defend

Beth Defend
Project Manager

Enclosure: Draft Environmental Assessment

cc: Lisa McCarrick, 56 FW/RMO, Luke AFB

No Historic Properties Affected

ja *Carmel Howard* 11-3-05
Arizona State Historic Preservation Office
Arizona State Parks Board

*Under Section 106 of the
National Historic Preservation
Act and 36 CFR Part 800.*

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*

From: Russ Engel [REngel@azgfd.gov]
Sent: Thursday, November 10, 2005 10:08 AM
To: Defend, Beth
Subject: Draft EA for Proposed Expeditionary Training at
AFAF

Beth

The Arizona Game and Fish Department has reviewed the above-referenced draft EA and does not foresee any significant adverse impacts to wildlife resulting from implementation of the proposed action.

Thank you for the opportunity to review and comment on this draft EA.

Russ Engel
Habitat Program Manager
Arizona Game and Fish Department
Region IV, Yuma
928-341-4042

Sample Consultation Letter Sent to Tribal Leaders
and the Arizona State Historic Preservation Office
and Corresponding Responses



DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

7 October 2005

James R. Uken
Director, 56th Range Management Office
7224 North 139th Drive
Luke AFB AZ 85309

Terry O. Enos, Chairman
Ak-Chin Indian Community
42507 West Peters and Nail Road
Maricopa AZ 85239

SUBJECT: Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field (AFAF),
Barry M. Goldwater Range (BMGR) East

Dear Chairman Enos

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the 56th Range Management Office (56 RMO), Luke Air Force Base (AFB), is initiating consultation regarding the above-referenced undertaking. In response to current, real world situations encountered by U.S. military personnel, the 56th Fighter Wing (56 FW) has identified a need to provide aircrews, maintenance technicians, security forces, and other personnel with predeployment expeditionary training to better equip them to fight and survive in combat situations.

The 56 FW proposes to conduct two predeployment training programs at Gila Bend AFAF in a setting that more realistically simulates conditions at a remote, deployed location. Air Expeditionary Force (AEF) training will prepare F-16 aircrews, aircraft maintenance personnel, and air operations planning personnel for deployment to airfields around the world. Pilots and support personnel would be based at Gila Bend AFAF for three to five days; during this time, large force exercises currently conducted from Luke AFB would be launched from Gila Bend AFAF. Expeditionary Thunderbolt Training (ETT) will prepare ground personnel for deployment in forward areas, including development of individual and team war-fighting skills that would be needed at an expeditionary forward air base or during convoy operations and travel (for example cover and concealment; defensive fighting positions and fighting; explosives ordnance disposal and identification; and enhanced self-help and buddy care).

Gila Bend AFAF is a 1,885-acre installation located in southwestern Maricopa County approximately five miles south of the Town of Gila Bend, Arizona, and east of State Route 85 on the BMGR East (Attachment 1). It includes an 8,500-foot by 150-foot fixed-wing aircraft runway and a six-pad heliport. Gila Bend AFAF was constructed to support pilot training during World War II. Most of the buildings associated with this era were demolished or removed after it was deactivated in 1946; new buildings and structures were built and the runway extended to support jet aircraft after Gila Bend AFAF was reactivated in 1951. Many of these buildings were demolished

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*

in the mid-1990s, after it was converted from active-duty military to civilian operation. Much of the cantonment area today consists of graded, vacant lots, some with concrete foundations.

To support AEF and ETT, the 56 RMO proposes to construct new billeting and operations facilities in two areas (Attachment 1). The expeditionary operations and billeting areas would be established on previously disturbed, vacant lots in two areas (see Attachment 2). Construction at both areas will be limited to installation of Alaska Small Shelter System (AKSSS) units. Ground disturbance will include pouring concrete slabs for each AKSSS, excavating trenches for utility hookups, and possibly excavating postholes for an internal perimeter fence. The AKSSS is a portable, lightweight, fabric-covered shelter with an aluminum frame (Attachment 2). Each AKSSS would be serviced with electrical power and a heating, ventilation, and air conditioning (HVAC) system. Self-contained portable toilet and shower facilities may be connected to existing water and waste-water lines.

Gila Bend AFAF has been entirely surveyed to identify and evaluate cultural resources. Ten sites and two isolated roasting features with possible subsurface deposits were identified, and the 56 RMO determined that all but one of these resources was eligible for inclusion on the NRHP. Survey findings were submitted to the State Historic Preservation Office (SHPO) and concerned tribes in March 2004 in support of Section 106 review of proposed runway clearing. The SHPO concurred with these eligibility determinations, and no concerns were expressed by tribal reviewers. A copy of the draft survey report was provided to the SHPO and tribal preservation offices for their review in August 2005.

No cultural resources were observed in the proposed AEF/ETT billeting and operations areas (Attachment 3). Ground-based ETT activities such as self-defense and convoy operations/travel will be restricted to existing roads and use areas and will avoid eligible properties. On this basis, the 56 RMO finds that *no historic properties will be affected* by the proposed action.

A proof-of principle AEF exercise will be conducted in November of 2005. If it is successful, the 56 FW proposes to conduct AEF and ETT training regularly. An Environmental Assessment (EA) of the potential effects of these expeditionary training programs is underway. You will receive a copy of the draft EA when it becomes available.

If you have questions about this proposal or concerns about potential impacts to cultural resources, please call Carol Heathington, 56 RMO Historic Preservation Officer at (623) 856-8492. If you prefer to meet with 56 RMO staff to review this proposal, or would like to visit the area, please let her know. Written comments should be directed to her attention at the above address. As always, we appreciate your continued support for our cultural resource program.

Sincerely

JAMES R. UKEN, GS-14, DAF

Attachments

1. Location of proposed expeditionary operations and billeting areas at Gila Bend AFAF
2. Photographs of proposed expeditionary operations and billeting areas and AKSSS
3. Map of Gila Bend AFAF showing cultural resources identified

~~WFO~~ 2005 - 2242 (25892) NHPA



DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

7 October 2005

Carol Heathington, Historic Preservation Officer
56th Range Management Office
7224 North 139th Drive
Luke AFB AZ 85309

RECEIVED

OCT 14 2005

AH 10/12/05
AIR EDUCATION AND TRAINING COMMAND

Ann Howard
Archaeologist/Public Programs Manager
State Historic Preservation Office
1300 West Washington
Phoenix AZ 85007

SUBJECT: Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field (AFAF),
Barry M. Goldwater Range (BMGR) East

Dear Ms. Howard

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the 56th Range Management Office (56 RMO), Luke Air Force Base (AFB), is initiating consultation regarding the above-referenced undertaking. In response to current, real world situations encountered by U.S. military personnel, the 56th Fighter Wing (56 FW) has identified a need to provide aircrews, maintenance technicians, security forces, and other personnel with predeployment expeditionary training to better equip them to fight and survive in combat situations.

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*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*

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To support AEF and ETT, the 56 RMO proposes to construct new billeting and operations facilities in two areas (Attachment 1). The expeditionary operations and billeting areas would be established on previously disturbed, vacant lots in two areas (see Attachment 2). Construction at both areas will be limited to installation of Alaska Small Shelter System (AKSSS) units. Ground disturbance will include pouring concrete slabs for each AKSSS, excavating trenches for utility hookups, and possibly excavating postholes for an internal perimeter fence. The AKSSS is a portable, lightweight, fabric-covered shelter with an aluminum frame (Attachment 2). Each AKSSS would be serviced with electrical power and a heating, ventilation, and air conditioning (HVAC) system. Self-contained portable toilet and shower facilities may be connected to existing water and waste-water lines.

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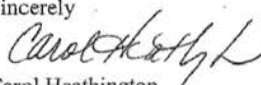
No cultural resources were observed in the proposed AEF/ETT billeting and operations areas (Attachment 3). Ground-based ETT activities such as self-defense and convoy operations/travel will be restricted to existing roads and use areas and will avoid eligible properties. On this basis, the 56 RMO finds that *no historic properties will be affected* by the proposed action, and we request your concurrence with this finding.

A proof-of-principle AEF exercise will be conducted in November of 2005. If it is successful, the 56 FW proposes to conduct AEF and ETT training regularly. An Environmental Assessment (EA) of the potential effects of these expeditionary training programs is underway. You will receive a copy of the draft EA when it becomes available.

If you have questions about this proposal or concerns about potential impacts to cultural resources, please call me at (623) 856-8492. Written comments should be directed to me at the above address. As always, we appreciate your continued support for our cultural resource program.


CONCUR
ARIZONA STATE HISTORIC PRESERVATION OFFICER
ARIZONA STATE PARKS BOARD
11-3-05

Sincerely


Carol Heathington
Historic Preservation Officer

Attachments

1. Location of proposed expeditionary operations and billeting areas at Gila Bend AFAF
2. Photographs of proposed expeditionary operations and billeting areas and AKSSS
3. Map of Gila Bend AFAF showing cultural resources identified

*Proposed Expeditionary Training at
Gila Bend AFAF and BMGR-East*



ARLEN P. QUETAWKI, SR.
Governor

CARMELITA SANCHEZ
Lt. Governor

CARLETON P. ALBERT, SR.
Head Councilman

ARDEN KUCATE
Councilman

ZUNI TRIBE

P.O. Box 339
1203-B State Highway 53
Zuni, New Mexico 87327-0339
<http://www.ashiwí.org>

505-782-7000 (☎)

505-782-7202 (☎)

CHARLOTTE T. BRADLEY
Councilwoman

EDWARD W. WEMYTEWA
Councilman

JOSEPH C. PEYNETSA
Councilman

WILLIAM TSIKEWA, SR.
Councilman

October 20, 2005

Carol Heathington
Historic Preservation Officer
56th Range Management Office
7224 North 139th Drive
Luke AFB, AZ 85309

RE: Proposed Expeditionary Training at Gila Bend Air Force Auxiliary Field (AFAF),
Barry M. Goldwater Range (BMGR) East

Dear Ms. Heathington:

Pursuant to your request dated October 7, 2005, the Zuni Heritage and Historic Preservation Office (ZHHPO) provides the following information with regards the cultural properties. At this time the Zuni Heritage and Historic Preservation Office has no comments on any possible historic properties affected by this undertaking.

On behalf of the Zuni Tribe and the Pueblo of Zuni, we thank you for providing an opportunity to comment on the undertaking. Should you require additional information, please call 505-782-4814.

Sincerely,

A handwritten signature in cursive script, appearing to read "Monica L. Enke".

Monica L. Enke
Cultural Resources Specialist, ZHHPO

7.0 DISTRIBUTION OF THE FINAL ENVIRONMENTAL ASSESSMENT

Federal Agencies

Steve Spangle
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David J. Farrel (CMD-2)
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Terri Raml
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Kathy Billings
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Becky Heick
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Larry Voyles
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Yuma, AZ 85365

Mr. Stephen Owens
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Town of Gila Bend
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Gila Bend, AZ 85337

County Manager
Pima County
Pima County Courthouse
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Lucy Shipp
Yuma County Board of Supervisors
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Wanda Wriston, Constable
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Yuma Valley Rod and Gun Club
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Bill Broyles
Friends of Cabeza Prieta
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Tucson, AZ 85704

William Keebler, President
AZ Desert Bighorn Sheep Society
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Jenny Neeley
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Tucson, AZ 85716

Gayle Hartmann
Sierra Club
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Tucson, AZ 85719

**Non-Governmental Organizations
(continued)**

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International Sonoran Desert Alliance
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Ajo, AZ 85321

Daniel Patterson
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Tribal Leaders

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Gila River Indian Community
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Sherry Cordova
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Chairman
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Kykotsmovi AZ 86039

Daniel Eddy, Jr.
Chairman
Colorado River Indian Tribes
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Herminia Frias
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Pascua Yaqui Tribe of Arizona
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Raphael Bear
President
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Fountain Hills AZ 85269

Joni Ramos
President
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Community
10005 E. Osborn Road
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Nora McDowell
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Needles CA 92363

Kathleen Wesley Kitcheyan
Chairman
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Mike Jackson, Sr.
President
Fort Yuma-Quechan Tribe
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Tribal Leaders (continued)

Vivian Juan-Saunders
Chairman
Tohono O'odham Nation
P.O. Box 837
Sells AZ 85634

Jamie Fullmer
Chairman
Yavapai-Apache Nation
2400 W. Datsi
Camp Verde AZ 86322

Ernest Jones, Sr.
President
Yavapai-Prescott Indian Tribe
530 East Merritt Street
Prescott AZ 86301

Arlen P. Quetawki, Sr.
Governor
Pueblo of Zuni
P. O. Box 339
Zuni NM 87327

Tribal Cultural Preservation Offices

Nancy Nelson
Cultural Resource Manager
Ak-Chin Him Dak Eco Museum &
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47685 N. Eco Museum Road
Maricopa AZ 85239

Lisa Wanstall
Director
Cocopah Museum
County 15 and Ave G
Somerton AZ 85350

George Ray
Acting Director
Colorado River Indian Tribal Museum
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Parker AZ 85344

Linda Otero
AhaMakav Cultural Preservation Office
Fort Mohave Indian Tribe
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Barnaby Lewis
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Cultural Resources Management
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Lorraine Eiler
President
Hia C-ed O'odham Alliance
4739 W. Hayward
Glendale AZ 85301

Leigh Kuwanwisiwma
Director
Hopi Cultural Preservation Office
Hopi Tribe
P.O. Box 123
Kykotsmovi AZ 86039

Amalia A.M. Reyes
Language and Culture Preservation
Specialist
Pascua Yaqui Tribe of Arizona
7474 South Camino de Oeste
Tucson AZ 85746

Tribal Cultural Preservation Offices
(continued)

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8.0 REFERENCES CITED

- Ahmet, Koral and Christopher J. Doolittle. 2005. The Gila Bend Air Force Auxiliary Field Survey: Intensive Archaeological Inventory and Evaluation of 2,322 Acres on the Barry M. Goldwater Range East, Arizona (draft report). Statistical Research, Inc., Tucson. March.
- Air Force Civil Engineer Support Agency. 2005. "Luke AFB, AZ Utility System Descriptions" Available at:
<http://www.afcesa.af.mil/userdocuments/publications/miscellaneous/ceo/ceoc/up/bidders/LukeSysDesc.pdf>. Accessed 21 September.
- ARCADIS, Geraghty & Miller. 1998. Water Resources Assessment for the Barry M. Goldwater Range Including the Cabeza Prieta National Wildlife Refuge and Gila Bend Auxiliary Field. Report prepared for Luke Air Force Base. 4 May.
- Arizona Department of Agriculture. 1999. Protected Native Plants by Categories. Effective 1999. <http://agriculture.state.az.us/PSD/protplantlst.htm>.
- Arizona Department of Commerce. 2005. Arizona Military Regional Compatibility Project, Joint Land Use Study Part 2: Gila Bend Air Force Auxiliary Field/Barry M. Goldwater Range. February.
- _____. 2003. Western Maricopa County, Luke Air Force Base Regional Compatibility Plan, Arizona Military Regional Compatibility Project. Available at:
http://www.azcommerce.com/doclib/commasst/wmcc_lafb_regional_compatibility_plan_-_march_2003.pdf. March.
- Arizona Department of Environmental Quality (ADEQ). 2005a. "Permits: Aquifer Protection Program." Available at:
<http://www.azdeq.gov/environ/water/permits/app.html>. Last Revision: 11 January.
- _____. 2005b. "Air Quality Plans: Nonattainment Areas and Attainment Areas with Maintenance Plans." Available at:
<http://www2.ev.state.az.us/environ/air/plan/notmeet.html>. Last revised 22 August.
- _____. 2004. Air Quality Annual Report 2004, Arizona Revised Statute 49-424.10. Available at: <http://www.azdeq.gov/function/forms/download/2004/air.pdf>
- _____. 2003. Air Quality Annual Report Fiscal Year 2003, Arizona Revised Statute 49-424.10. Available at:
<http://www.azdeq.gov/function/forms/download/2003/aq.pdf>

- Arizona Department of Environmental Quality (ADEQ). 2002a. Monitoring and Assessment: Arizona's Integrated 305(b) Water Quality Assessment and 303(d) Listing Report. Volume II. "Middle Gila Watershed" Available at:
<http://www.azdeq.gov/environ/water/assessment/download/305-02/13mg.pdf>
- _____. 2002b. Air Quality Annual Report Fiscal Year 2002, Arizona Revised Statute 49-424.10. Available at:
<http://www.azdeq.gov/function/forms/download/2002/aq.pdf>
- Arizona Department of Transportation. 2005. "Average Annual Daily Traffic (AADT) Reports (Traffic Counts) 2002 to 2004" Available at
<http://tpd.azdot.gov/datateam/aadt.php>
- _____. 2004. Fact Sheet "State Route 85 I-10 to Gila Bend." Available at
<http://www.azdot.gov/roads/sr85/factsheet.htm>. Last updated 19 March.
- Arizona Department of Water Resources (ADWR). 2001. Arizona Water Information.
<http://www.adwr.state.az.us/azwaterinfo/OutsideAMAs/LowerColoradoRiver/basins/lowergila.html>. Accessed 2 July.
- Arizona Game and Fish Department (AGFD). 2002. Sonoran Pronghorn Antelope. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.
- _____. 2001. "Desert Tortoise." Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 11 pp.
http://www.azgfd.com/w_c/edits/documents/Gophagas.fi_000.pdf
- _____. 1996 (in preparation). Wildlife of Special Concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pp.
- Arizona Geological Survey. 1988. Geological Map of Arizona, Map 26, 1:1,000,000.
- Brown, D.E., C.H. Lowe, and C.P. Pase. 1979. A digitized classification system for the biotic communities of North America, with community (series) and association examples for the Southwest. *Journal of the Arizona-Nevada Academy of Science* 14, (Suppl. 1):1-16.
- Brownlow, Cris and Tim Sizemore. 2005. E-mail communication between Cris Brownlow, Community Planner, 56 CES/CECB, and Beth Defend, TEC Inc. regarding project descriptions for cumulative effects analysis. 6 October. Clarification provided via e-mail Tim L. Sizemore, 56 RMO/QA 12 October.

- City of Glendale. 2005. Transportation Traffic County Program. "2004 Annual Average Daily Traffic." Available at:
<http://www.ci.glendale.az.us/Transportation/documents/Adt2004.pdf>. June.
- City of Goodyear. 2004. "Traffic Counts, Average City of Goodyear Daily Traffic Counts." Available at: <http://www.ci.goodyear.az.us/index.asp?NID=147>. Last updated 3 May.
- Cockrum, E.L. and Y. Petryszyn. 1991. The Long-nosed Bat, *Leptonycteris*: An Endangered Species in the Southwest? Occasional Papers, the Museum, Texas Tech University. No. 142, 2 pp.
- Council on Environmental Quality (CEQ). 2005. Memorandum regarding "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis. 24 June.
- _____. 1997. Considering Cumulative Effects under the National Environmental Policy Act. Office of the President. January.
- _____. 1981. Forty Most Asked Questions Concerning CEQs National Environmental Policy Act Regulations (40 CRF 1500 – 1508). Printed in the Federal Register Vol. 46, No. 55, 18026-18038. 23 March.
- Dalton, D.C. 2001. Foraging habitat and activity of the California leaf-nosed bat, *Macrotus californicus*, located on the eastern section of the Barry M. Goldwater Air Force Range. July.
- Dalton, V.M. and D.C. Dalton. 1994. Mine/bat Survey: Eastern and Western Sections Barry M. Goldwater Air Force Range. Final Report. Report submitted to Luke Air Force Base 56 CES/CEVN. 113 pp.
- Dalton, V.M., D.C. Dalton, P.E. Brown, and R.D. Berry. 2000. Foraging habitat and activity of the California leaf-nosed bat, *Macrotus californicus*, located on the eastern section of the Barry M. Goldwater Air Force Range. February.
- Dames & Moore. 1996. Sensitive Species Surveys on the Barry M. Goldwater Range, Final Report. Prepared for Department of Defense, Luke Air Force Base. December.
- Department of Defense (DoD). 2003. United Facilities Criteria 4-010-01, Department of Defense Minimum Antiterrorism Standards for Buildings. 8 October.
- Environmental Protection Agency (EPA). 2005a. "National Ambient Air Quality Standards (NAAQS)." Available at: <http://epa.gov/air/criteria.html>

- Environmental Protection Agency (EPA). 2005b. "National Ambient Air Quality Standard Attainment Designations, Region 9." Available at: http://www.epa.gov/region09/air/maps/maps_top.html. Map for PM₁₀ dated 27 December 2004; map for 1-hour Ozone dated 15 June 2005; map for 8-hour Ozone dated 23 March 2005.
- _____. 2004a. "New Source Review, Prevention of Significant Deterioration (PSD) Basic Information." Available at: <http://www.epa.gov/NSR/psd.html#air>. Last update 30 June.
- _____. 2004b. Report No. NR-005c, *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling*. April
- _____. 2004c. EPA Report No. NR-009c, *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition*. April.
- _____. 1991. EPA 460/3-91-02, *Nonroad Engine and Vehicle Emission Study—Report*. November.
- Federal Emergency Management Agency (FEMA). 1988. Flood Insurance Rate Index Map.
- Gelt, Joe. 1992. Land Subsidence, Earth Fissures Change Arizona's Landscape. *Arroyo*. Tucson, Arizona Volume 6, Number 2. Pp. 1-12.
- GeoLytics, Inc. 1999. *Census CD 1980*, Version 1.0, New Brunswick, NJ. In "Gila Bend Socioeconomic Trends 1970-2000." Prepared by the Sonoran Institute for the Bureau of Land Management to contribute to planning for the Sonoran Desert National Monument. May 2003.
- Hervet, J.J., J.L. Bright, M.T. Brown, L.A. Piest, and R.S. Henry. 2000. Sonoran pronghorn population monitoring: 1994-1998. Nongame and Endangered Wildlife Program Technical Report 162. Arizona Game and Fish Department, Phoenix, Arizona.
- Hoffmeister, D.F. 1986. *Mammals of Arizona*. Tucson: University of Arizona Press. 602 pp.
- Jenssen, Maj. Jeff. 2005. E-mail communication between Maj. Jeff Jenssen, Chief, 56 FW Plans and Beth Defend, TEC Inc. 26 September.
- Keane, Melissa, J. Simon Bruder, Michael Corbett, Deborah Olszewski and Glenn P. Darrington. 1998. *Pilots in Training: A Historic and Archaeological Inventory of Luke Air Force Base and the Gila Bend Air Force Auxiliary Field*. Intermountain Cultural Resource Services Research Paper No. 23. Dames & Moore, Phoenix.

Keane, Melissa, Jannelle Warren-Findley, Michael Corbett and J. Simon Bruder. 1997. *Training Cold Warriors: An Historical Perspective and Consideration of the Built Environment at Luke AFB and the Gila Bend AFAF, 1946-1989*. Intermountain Cultural Resource Services Research Paper No. 39. Dames & Moore, Phoenix.

Krausman, P.R., L.K. Harris, and J. Francine. 2001. *Noise Effects of Military Overflights on Sonoran Pronghorn*. Final Report to the 56th FW/RMO, Luke AFB, Arizona. Air Force Center for Environmental Excellence Contract F41624-98-C-8020. University of Arizona, School of Renewable Natural Resources, Wildlife and Fisheries Program. 101 pp. June.

Luke Air Force Base (AFB). 2005. Urban Development, Annexation Report "Fact Sheet on Gila Bend Auxiliary Field at the Barry M. Goldwater Range, Gila Bend Arizona. Available at:
<https://www.luke.af.mil/urbandevelopment/docs/Fact%20Sheet%20on%20Gila%20Bend.doc>. Accessed 21 September.

_____. 2000. Final Environmental Assessment for the Proposed Construction of Additional Facilities at the Gila Bend Air Force Auxiliary Field Munitions Storage Area. 56th Fighter Wing Range Management Office. July.

_____. 1997a. Barry M. Goldwater Range Renewal Legislative Environmental Impact Statement Final Noise Technical Report. Prepared by Wyle Laboratories. 13 August.

_____. 1997b. Proposed Demolition or Relocation of 112 Buildings and Structures at Gila Bend Air Force Auxiliary Field Final Environmental Assessment. February.

_____. 1995. Draft Natural Resources Management Plan for Luke Air Force Base Auxiliary Field 1 Gila Bend Air Force Auxiliary Field.

Maricopa Association of Governments. 2003. Interim Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone Available at:
<http://www.mag.maricopa.gov/pdf/cms.resource/InterimProjections200398358.pdf>. July.

Maricopa County. 2005. "Dust & Smoke Control: Earthmoving." Available at:
<http://www.maricopa.gov/aq/DUST/DustEM.asp>. Page updated 10 August.

_____. 2004a. Air Quality Rules and Regulations. "Rule 310: Fugitive Dust. Available at: <http://www.maricopa.gov/aq/RULES/docs/310-0404.pdf>. Adopted 7 April.

_____. 2004b. "Maricopa County Eye to the Future 2020 Plan." Available at:
<http://www.maricopa.gov/planning/compln/growing.asp>. Copyright 2004.

- Maricopa County. 2001. "Rule 200: Permit Requirements." Available at <http://www.maricopa.gov/aq/rules/docs/200-0108.pdf>. Adopted 22 August.
- Maricopa County Air Quality Department. 2005. 2004 Air Monitoring Network Review. Available at: <http://www.maricopa.gov/aq/AIRDAY/docs/REVIEW04.pdf>. May.
- McCarrick, Lisa. 2005. E-mail communication between Lisa McCarrick, 56 FW RMO/ESMP, and Beth Defend, TEC Inc., regarding the project description for the replacement of a diesel tank at Gila Bend AFAF and other outstanding information for the environmental assessment. 11 October.
- Mendez, David. 2005. E-mail communication from David Mendez, 56 RMO/QA, to Lisa McCarrick, 56 RMO/ESMP, with an attachment titled "Gila Bend AFAF Tower Traffic Count 9-21-2005" and covering the period from October 1994 through September 2005. 22 September.
- Millsap, B.A. and R.R. Johnson. 1988. Ferruginous Pygmy-Owl. Pages 137-139 *In* R.L. Glinski et al., eds. Proceedings of the Southwest Raptor Management Symposium and Workshop. National Wildlife Federation, Washington, D.C.
- Natural Resources Conservation Service. 1997. Soil Survey of the Gila Bend-Ajo Area, Arizona – Parts of Maricopa and Pima Counties. *In* U.S. Air Force. 1999. Renewal of the Barry M. Goldwater Range Land Withdrawal Final Legislative Environmental Impact Statement, Volumes I and II. March.
- Oswald, Eric. 2005. Telephone and e-mail communication between Eric Oswald, Natural Resource Planner, 56 FW/RMO, and Beth Defend, TEC Inc., regarding permits for expeditionary training. 30 September.
- Phillips, S.J. and P. W. Comus (eds.). 2000. A Natural History of the Sonoran Desert. Arizona-Sonoran Desert Museum Press, Tucson, Arizona.
- Pima Association of Governments. 2004. "Traffic Volumes in Metropolitan Tucson and Easter Pima County 2004." Prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration, and the Arizona Department of Transportation. Tucson, Arizona. Printed in September.
- Sellers, W. D., and R. H. Hill. 1974. *Arizona Climate: 1931-1972* (2nd edition). University of Arizona Press, Tucson.
- Sizemore, Tim. 2005. Personal communication between Tim Sizemore, 56 FW/RMO/QA, and Beth Defend, TEC Inc. 20 September.

- Thomas, Alan C. 2005. E-mail communication between Mr. Allen C. Thomas, PE, Restoration Programs Manager, Luke AFB Environmental Flight, and Carol Wirth, TEC. 27 September.
- Tisdale, Shelby. 1998. Comprehensive Plan for the Consideration of Traditional Cultural Places and Sacred Sites on the Barry M. Goldwater Air Force Range. Dames & Moore, Phoenix.
- Turner, R.M. and Brown, D.E. 1982. Sonoran desert scrub. *In* Brown, D.E. (ed.), Biotic communities of the American Southwest – United States and Mexico. Desert Plants 4. Pp. 181-221.
- U.S. Air Force. 2000. Air Force Instruction 133-212VI, Luke AFB Supplement 1, Annex A. Space, Missile, Command and Control. Weapons Ranges. 1 June.
- _____. 1999. Renewal of the Barry M. Goldwater Range Land Withdrawal Final Legislative Environmental Impact Statement, Volumes I and II. March.
- U.S. Air Force. 1996. Air Force Handbook 10-222. Volume 2, Guide to Bare Base Assets. Accessible at: <http://www.e-publishing.af.mil/pubfiles/af/10/afh10-222v2/afh10-222v2.pdf>. 1 December.
- _____. 1986. Natural Resources Management Plan for Luke Air Force Range. Report prepared for Luke Air Force Base, Arizona by University of Arizona, Department of Agriculture.
- U.S. Air Force, U.S. Navy, and U.S. Department of Interior. 2005. Final Environmental Impact Statement, Barry M. Goldwater Range Proposed Integrated Natural Resources Management Plan.
- U.S. Department of Energy. 2003. Energy Information Administration. “Electric Sales and Revenue Spreadsheets, Table 1. U.S. Average Monthly Bill by Sector, Census Division, and State, 2003.” Available at: <http://www.eia.doe.gov/cneaf/electricity/esr/table1abcd.xls#Table1!A1>
- U.S. Fish and Wildlife Service (USFWS). 2005a. Biological Opinion for the Integrated Natural Resource Management Plan for the Barry M. Goldwater Range (02-21-05-F-0492). 26 August.
- _____. 2005b. Vol. 70, No. 148, Pages 44547 – 44552. Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17, Endangered and Threatened Wildlife, and Plants; Proposed Rule To Remove, the Arizona Distinct Population Segment of the Cactus Ferruginous Pygmy-Owl From the Federal List of Endangered and Threatened Wildlife; Proposal To Withdraw the Proposed Rule To Designate Critical Habitat. 3 August.

- U.S. Fish and Wildlife Service (USFWS). 2003a. Supplement and Amendment to 1998 the Final Revised Sonoran Pronghorn Recovery Plan (*Antilocapra americana sonoriensis*). Albuquerque, New Mexico. 25 November.
- _____. 2003b. Revised biological opinion based on review of the proposed military training administered by the U.S. Air Force on the BMGR and its effects on the Sonoran pronghorn (*Antilocapra americana sonoriensis*). AESO/SE 2-21-96-F-094-R2. 6 August.
- _____. 2003c. Revised biological opinion based on review of the proposed and ongoing activities by MCAS Yuma in the Arizona portion of the YTRC on the BMGR and its effects on the endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) and endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*). AESO/SE 02-21-95-F-0114R4. 6 August.
- _____. 2003d. Army National Guard: Revised biological opinion based on review of the Western Army National Guard Aviation Training Site (WAATS) expansion and its effects on the Sonoran pronghorn (*Antilocapra americana sonoriensis*). AESO/SE 2-21-93-F-389R2. 6 August.
- _____. 2002. Vol. 67, No. 229, Pages 71032 – 71064. Part V, Department of the Interior, Fish and Wildlife Service, 50 CFR Part 17, Endangered and Threatened Wildlife and, Plants; Designation of Critical Habitat for, the Arizona Distinct Population Segment of the Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*); Proposed Rule. 27 November.
- _____. 2001a. Court Remanded Sonoran Pronghorn Biological Opinion- Military Training on Barry M. Goldwater Range (02-21-96-F-094-R1). 16 November.
- _____. 1999. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*) Final rule. Federal Register Vol. 64, No. 132, pp. 37419-37440. 12 July.
- _____. 1997. Summary Biological Opinion for “Use of Ground-Surface and Airspace for Military Training on the Barry M. Goldwater Range which may Affect the Endangered Sonoran Pronghorn” (2-21-96-F-094). 27 August.
- _____. 1998. Final Revised Sonoran Pronghorn Recovery Plan (*Antilocapra americana sonoriensis*). Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 3 December. 92 pp.
- _____. 1994a. Arizona Ecological Services State Office Phoenix, Arizona. Lesser Long-nosed Bat Recovery Plan. Prepared for Region 2, U.S. Fish & Wildlife Service, Albuquerque. May. 45 pp.

- U.S. Fish and Wildlife Service (USFWS). 1994b. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Cactus Ferruginous Pygmy-Owl in Arizona. Federal Register 62:10730.
- _____. 1994b. Sonoran Pronghorn Recovery Plan Revision (*Antilocapra americana sonoriensis*). Technical/agency draft. Region, Albuquerque, New Mexico
- U.S. Geological Survey (USGS). (online). 2000. Earthquake History of Arizona. Available at: www.neic.cr.usgs.gov/neis/states/arizona/arizona_history.html. Accessed 1 June. In U.S. U.S. Air Force. 2000. Final Environmental Assessment for the Proposed Construction of Additional Facilities at the Gila Bend Air Force Auxiliary Field Munitions Storage Area. 56th Fighter Wing Range Management Office. July.
- _____. 1992. Summary of Groundwater Conditions in Arizona. Spring 1986 to Spring 1987. Open-file Report 92-54.
- U.S. Census Bureau. 2000. Census 2000 Summary File 1 (SF 1) and Summary File 3 (SF 3). U.S. Census Bureau, American FactFinder Data Sets. Available at: http://factfinder.census.gov/home/saff/main.html?_lang=en. Generated by Carol Wirth, TEC Inc. 23 September.
- _____. 1990. Summary File 1 (SF 1) and Summary File 3 (SF 3). Available at: http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=DEC&_lang=en&_ts=. Generated by Carol Wirth, TEC Inc. 23 September.
- _____. 1970. U.S. Bureau of the Census, Census of Population: 1970, Vol. 1, *Characteristics of the Population*, Part 4, Arizona. In "Gila Bend Socioeconomic Trends 1970-2000." Prepared by the Sonoran Institute for the Bureau of Land Management to contribute to planning for the Sonoran Desert National Monument. May 2003.
- University of Arizona. 2005. Water Sustainability, "AZ Know your Water." Available at: <http://uawater.arizona.edu/pubs/AZKnowYourWater/>
- Wright, R.L. and J.C. de Vos. 1986. Final Report on Sonoran Pronghorn Status in Arizona. Prepared by Arizona Game and Fish Department. Contract No. F0260483MS143. Phoenix, Arizona. 132 pp.