
Supplemental Environmental Assessment

Proposed Special Use Airspace at Laguna Army Airfield Yuma Arizona

Prepared for
U.S. Army Yuma Proving Ground
Yuma, Arizona



Prepared by
U.S. Army Corps of Engineers



**US Army Corps
of Engineers®**
Mobile District

July 2015

Draft Finding of No Significant Impact

Proposed Special Use Airspace at Laguna Army Airfield Yuma Proving Ground, Arizona

The U.S. Army Garrison Yuma Proving Ground prepared a supplemental environmental assessment (EA) to identify and evaluate potential environmental impacts associated with the establishment of special use airspace (SUA) restricted area (R-2306F, Yuma, AZ) at Laguna Army Airfield (LAAF) (Federal Aviation Administration [FAA] location identifier Laguna Field [LGF]) on YPG (Proposed Action). The Proposed Action would allow for the safe, proper, and complete testing and evaluation of emergent experimental aviation platforms and their associated subsystems. Establishment of an SUA restricted area at LAAF would allow YPG to maximize the existing, fixed infrastructure to support current and future hazardous tests of emergent experimental aviation platforms, weapons, and associated subsystems programs, while minimizing the risk to public and non-participating aircraft. The Proposed Action would reduce hazards to the general aviation public from exposure to non-eye-safe lasers and high-power radar systems, by establishing appropriate safe explosive ordnance zones, and from interacting with experimental aircraft and weapons systems, and increase flexibility for testing future aircraft and weapons. The EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA [Title 40, United States Code, Parts 1500 through 1508]; Department of Defense (DoD) Directive 4715.9 Environmental Planning and Analysis; and Environmental Analysis of Army Actions (Code of Federal Regulations, Title 32, Part 651), and FAA Order 1050.1E *Environmental Impacts: Policies and Procedures* (FAA, 2006).

In preparation of the EA, no alternatives, other than those presented in the EA, were determined to satisfy the purpose and need of the Proposed Action. Two alternatives were evaluated for potential use but were not carried forward because either the alternative had an incorrect size of airspace to provide required safe testing of aircraft and associated subsystems or the alternative had inadequate infrastructure or size to accommodate all aircraft platforms.

Description of the Proposed Action

The proposed SUA would be designated R-2306F Yuma, AZ, and would encompass the area between the surface up to, and including, an altitude of 1,700 feet Mean Sea Level (MSL) (1,267 feet Above Ground Level [AGL]). It would extend in a horizontal arc to the south to a distance of 3.5 nautical miles centered from LAAF within a set boundary, which would be within the YPG boundary. The published time of use of the proposed SUA would be intermittent from 0600 to 1800 daily, Monday through Saturday, and other times by Notices to Airmen (NOTAM). The Controlling Agency would be the Yuma Approach Control, Marine Corps Air Station (MCAS), Yuma, and the Using Agency would be the Commander, YPG.

The Proposed Action represents a modification from the airspace evaluated as part of the *Final Environmental Assessment for the Unmanned Aircraft Systems Test Center*. In that document the proposed SUA restricted area consisted of a 4-mile radius arc south of LAAF using the midpoint of the airfield as the center point. The area abutted the southern boundaries of existing restricted use airspace at YPG (R-2306E to the west and R-2307 to the east).

No Action Alternative

Under the No Action Alternative, a new SUA restricted area would not be established. The public would remain at risk from testing activities involving non-eye-safe lasers, explosive ordnance, or testing accidents. Aircraft testing at YPG would continue to be performed in an inefficient manner.

Environmental Consequences

The EA evaluated potential impacts on air quality, noise, biological resources, air transportation, hazardous and toxic substances, health and human safety, aesthetics and visual resources, and recreation. Land use, geology, soils, mineral resources, water resources, cultural resources, socioeconomics, environmental justice and the protection of children, ground transportation, and utilities were eliminated from analysis because there is no potential for impacts to them from the Proposed Action.

As discussed in the EA, implementing the Proposed Action would result in long-term less than significant impacts to air transportation, and recreation (recreational aviation activities) from the implementation of restrictions on the use of airspace. Less than significant impacts to local air quality could also occur from periodic increases in the frequency of testing activities. There would be long-term beneficial impacts to health and human safety as a result of the Proposed Action by protecting non-participating aircraft from testing, laser, and explosives risks. It was determined that there would be no impacts to noise, biological resources, hazardous and toxic substances, or aesthetics and visual resources from implementation of the Proposed Action.

Public Participation

The U.S. Army Garrison Yuma Proving Ground contacted potentially interested stakeholders, agencies, and tribal governments in letters dated June 18, 2015 to solicit comments and concerns. A public notice was published in the Yuma Sun on (DATE TO BE ADDED) announcing the availability of the EA and draft FNSI for review and comment. The public review period ended (DATE TO BE ADDED) and comments received were addressed and incorporated into the EA, as appropriate.

Conclusion

Based on the analysis presented in the EA for establishing an SUA restricted area, no significant environmental impacts are anticipated as a result of implementing the project under the Proposed Action. Therefore, preparation of an Environmental Impact Statement is not required and a FNSI is the appropriate decision document to conclude the NEPA process.

I have read and concur with the findings and analyses documented in the Environmental Assessment and hereby approve the Finding of No Significant Impact.

RANDY MURRAY
COL, AV
Commanding

Date

Gordon K. Rogers
Manager, Garrison

Date

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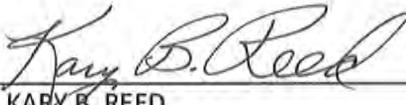
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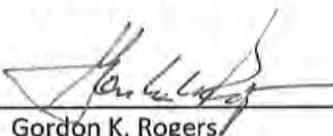
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Contents

Section	Page
Acronyms and Abbreviations.....	V
1 Purpose and Need.....	1-1
1.1 Introduction.....	1-1
1.2 Purpose and Need for the Proposed Action.....	1-1
1.2.1 Project Need.....	1-2
1.3 Scope of Analysis.....	1-3
1.3.1 Resource Areas Eliminated from Analysis.....	1-4
1.4 Agency and Public Participation.....	1-5
2 Description of Proposed Action and Alternatives.....	2-1
2.1 Proposed Action.....	2-1
2.2 No Action Alternative.....	2-2
2.3 Alternatives Considered but Not Carried Forward.....	2-2
3 Affected Environment.....	3-1
3.1 Air Quality.....	3-1
3.1.1 Ambient Air Quality.....	3-1
3.1.2 Affected Environment.....	3-2
3.2 Noise.....	3-3
3.3 Biological Resources.....	3-7
3.3.1 Birds.....	3-7
3.3.2 Threatened and Endangered Species.....	3-8
3.4 Air Transportation.....	3-9
3.5 Hazardous and Toxic Substances.....	3-12
3.5.1 Background.....	3-12
3.5.2 Hazardous Substances Management.....	3-12
3.5.3 Fuels and Petroleum Products.....	3-12
3.5.4 Solvents.....	3-13
3.5.5 Spill Containment.....	3-13
3.5.6 Disposal.....	3-13
3.6 Health and Human Safety.....	3-13
3.7 Aesthetics and Visual Resources.....	3-14
3.8 Recreation.....	3-14
4 Environmental Consequences.....	4-1
4.1 Air Quality.....	4-1
4.1.1 Proposed Action.....	4-1
4.1.2 No Action Alternative.....	4-1
4.2 Noise.....	4-1
4.2.1 Proposed Action.....	4-1
4.2.2 No Action Alternative.....	4-2
4.3 Biological Resources.....	4-2
4.3.1 Proposed Action.....	4-2
4.3.2 No Action Alternative.....	4-2
4.4 Air Transportation.....	4-2

4.4.1	Proposed Action.....	4-2
4.4.2	No Action Alternative	4-3
4.5	Hazardous and Toxic Substances	4-3
4.5.1	Proposed Action.....	4-3
4.5.2	No Action Alternative	4-4
4.6	Health and Human Safety	4-4
4.6.1	Proposed Action.....	4-4
4.6.2	No Action Alternative	4-4
4.7	Aesthetics and Visual Resources.....	4-4
4.7.1	Proposed Action.....	4-4
4.7.2	No Action Alternative	4-4
4.8	Recreation.....	4-5
4.8.1	Proposed Action.....	4-5
4.8.2	No Action Alternative	4-5
4.9	Cumulative Impacts	4-5
5	Conclusions	5-1
6	Preparers, Agencies, and Persons Consulted	6-1
7	References.....	7-1

Tables

3-1	NAAQS for Criteria Pollutants	3-1
3-2	Comparison of Yuma Proving Ground Air Emissions to Yuma County Air Emissions ^a	3-3
3-3	YPG Installation Compatible Use Zones	3-4
3-4	Anticipated Risk of Noise Complaints from Predicted Peak Sound Levels	3-5
3-5	Percentage of Public Likely to be Highly Annoyed by Aircraft Noise.....	3-5
3-6	Restricted Areas	3-11

Figures

1-1	Project Location	1-7
1-2	Yuma Proving Ground Restricted Airspace and Proposed Special Use Airspace.....	1-8
2-1	Project Location	2-3

Acronyms and Abbreviations

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
ADEQ	Arizona Department of Environmental Quality
ADNL	A-weighted day-night average noise level
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
AST	aboveground storage tanks
AZGFD	Arizona Game and Fish Department
BLM	U.S. Bureau of Land Management
BSA	Boy Scouts of America
CAA	Clean Air Act
CDH	Castle Dome Heliport
CDNL	C-weighted average day-night noise level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	Methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	CO ₂ equivalent
D.A.R.E.	Drug Abuse Resistance Education
dB	Decibel
dBA	A-weighted sound pressure level
dBC	C-weighted sound pressure level
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
ft	feet
FTS	Flight Termination System
GHG	greenhouse gas
H ₂ O	Water vapor
HAP	hazardous air pollutant

HCA	Howard Cantonment Area
HWSF	Hazardous Waste Storage Facility
ICUZ	Installation Compatible Use Zone
IFR	instrument flight rules
IONMP	Installation Operational Noise Management Plan
LAAF	Laguna Army Airfield
MBTA	Migratory Bird Treaty Act of 1918
MCAS	Marine Corps Air Station
mg/m ³	milligrams per cubic meter
MOA	military operations area
MRTFB	Major Range and Test Facility Base
MSL	Mean Sea Level
N ₂ O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NO ₂	nitrogen dioxide
NOTAM	Notices to Airmen
NO _x	nitrogen oxides
NWR	National Wildlife Refuge
NZ	Noise Zone
O ₃	ozone
ODC	ozone-depleting chemical
PAO	Public Affairs Office
Pb	lead
PFC	perfluorocarbons
PM ₁₀	particulate matter less than or equal to 10 micrometers in diameter
PM _{2.5}	particulate matter less than or equal to 2.5 micrometers in diameter
ppb	parts per billion
ppm	parts per million
SF ₆	sulfur hexafluoride
SO ₂	sulfur dioxide
SUA	special use airspace
tpy	tons per year
TSCA	Toxic Substances Control Act
U.S.	United States

UAS	Unmanned aircraft systems
UAV	Unmanned Aerial Vehicle
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tanks
VOCs	volatile organic compounds
WCA	Walker Cantonment Area
YDNL	yearly day-night average noise level
YPG	Yuma Proving Ground

Purpose and Need

1.1 Introduction

The United States (U.S.) Army Yuma Proving Ground (YPG) is located approximately 25 miles northeast of the city of Yuma in southwestern Arizona (Figure 1-1). YPG is a U-shaped facility encompassing approximately 1,310 square miles (838,174 acres). The land between the arms of the “U” is managed by the U.S. Fish and Wildlife Service (USFWS) as the Kofa National Wildlife Refuge (NWR). YPG is a Major Range and Test Facility Base, known as an MRTFB. It serves as the Army’s center for desert natural environment testing for artillery, equipment and armament, target acquisition, vehicles, a variety of munitions, personnel, and supply parachute systems, aviation weapons and sensors, and specialized equipment.

YPG is a research, development, testing, and evaluation facility on which weapon systems are tested both in the air and on the ground. These weapon systems include artillery, mortars, rockets, missiles, and bombs. Additionally, non-weapon aerial systems including manned and unmanned aircraft annually conduct up to approximately 15,000 sorties at YPG. These missions include test and evaluation of aircraft systems, air cargo delivery systems, and airborne sensory equipment.

YPG has special use airspace (SUA) that establishes priority for military use over most of the installation and over most of the adjacent Kofa NWR (Figure 1-2), such that the airspace is restricted during military operations. While SUA places priority on military operations, YPG airspace can be used by private or commercial flights with advance clearance when not in use by YPG.

This Supplemental Environmental Assessment (EA) analyzes and documents impacts on the human and natural environment that could result from implementation of the Army’s Proposed Action, which is to establish an SUA restricted area (R-2306F, Yuma, AZ) as described in Sections 1.2 and 2.1. YPG completed the *Final Environmental Assessment for the Unmanned Aircraft Systems Test Center* in 2008 (YPG, 2008). This Supplemental EA is tiered from the analyses in that document.

1.2 Purpose and Need for the Proposed Action

The Proposed Action is to establish an SUA restricted area (R-2306F, Yuma, AZ) at Laguna Army Airfield (LAAF) (Federal Aviation Administration [FAA] location identifier Laguna Field [LGF]) on YPG. The purpose of the Proposed Action is to allow for the safe, proper, and complete testing and evaluation of emergent experimental aviation platforms and their associated subsystems. Aviation systems tested at YPG serve as platforms for various subsystems integration as they progress through the development cycle. This includes subsystems that pose safety risks such as non-eye-safe lasers and high power radars, and developmental weapons systems that utilize explosive ordnance. The testing programs involve integrating proven aircraft with unproven weapons systems, and unproven aircraft with proven and unproven weapons systems. All of these tests pose a hazard to the public and non-participating aircraft. Non-participating aircraft would include civilian aircraft and other aircraft not directly involved with testing activities at YPG. Establishment of an SUA restricted area at LAAF would allow YPG to maximize the existing, fixed infrastructure to support current and future hazardous tests of emergent experimental aviation platforms, weapons, and associated subsystems programs, while minimizing the risk to public and non-participating aircraft.

The Proposed Action also would allow for greater flexibility and efficiency in the aircraft testing program. As an MRTFB, YPG is required to be prepared to support the evolving requirements of the military and their operations. The desert environment at YPG emulates a current theater of operations. Establishment of an SUA restricted area at LAAF would allow YPG to maximize the existing, fixed infrastructure to support current and future hazardous tests and validation of emergent experimental aviation platforms, weapons, and associated subsystems programs, while minimizing the risk to public and non-participating aircraft.

1.2.1 Project Need

The new SUA restricted area would meet the following project needs:

- Reduce hazards to the general aviation public from exposure to non-eye-safe lasers and high-power radar systems
- Reduce hazards to the general aviation public by establishing appropriate safe explosive ordnance zones
- Reduce hazards to the general aviation public from interaction with experimental aircraft and weapons systems
- Increase flexibility for testing of future aircraft and weapons

1.2.1.1 Reduce Hazards to the General Aviation Public from Exposure to Non-eye-safe Lasers and High-power Radar Systems

Aviation systems serve as platforms for various subsystems' integration with non-eye-safe lasers, high-power radars, as well as developmental weapons systems as they mature and progress through the development cycle. Prior to launching a platform, such as an integrated non-eye-safe laser platform, the system must be ground-tested within a controlled open-air environment on LAAF. Upon successful ground-testing, the still unproven, integrated non-eye-safe laser system platform may conduct air-to-ground boresight alignment tests over the airfield, using a non-reflective ground target, prior to ingress to the range. Given the developmental nature of these integrated systems, there is a potential for un-commanded or uncontrolled lasing of non-participants (i.e., individuals within civilian aircraft or other aircraft not directly involved with testing activities at YPG). Currently, nonparticipating aircraft may transit across the airfield without limitation and without warning. Establishment of the restricted area is required to effectively de-conflict civilian air traffic.

This necessary development testing drives a requirement for restricted airspace in accordance with FAA regulations (JO 7400.2K). The YPG mission and one of YPG's core capabilities in the Army is to conduct developmental tests and evaluate against expected objectives. Sometimes problems are detected during testing that require immediate fixes prior to continuation. Unproven integrated weapons systems require an extra margin of safety in a controlled environment. Early research and development platforms are immature and pose a potential hazard to non-participants should unanticipated anomalies occur with radio frequency links, pre-mature weapon deployment, or other facets of an aviation system.

1.2.1.2 Reduce Hazards to the General Aviation Public by Establishing Appropriate Safe Explosive Ordnance Zones

The SUA restricted area is necessary to segregate activities considered hazardous to non-participating aircraft and to provide explosive quantity distances for the safe storage, handling, and integration of explosive ordnance in accordance with recommendations of the Public Transportation Route Distance ground clearance criteria (DA PAM 385-64). These criteria set the minimum distance separating a potential explosion site from surface traffic routes used by the public: 1,250 feet (ft) for buildings and 750 ft for non-participating personnel. The proposed restricted airspace ceiling of 1,700 ft Mean Sea Level (MSL) and 1,267 feet above ground level (AGL) would provide a similar vertical buffer for non-military aircraft to explosive hazards. The additional restricted airspace would also provide an expanded range to meet requirements of systems with greater weapon standoff distances, as well as appropriate explosive safety zones around existing munitions storage sites, loading sites, and testing facilities permanently located on LAAF.

1.2.1.3 Reduce Hazards to the General Aviation Public from Interaction with Experimental Aircraft and Weapons Systems

The SUA restricted area classification for LAAF is necessary to safely segregate the testing and evaluation of hazardous, unproven research and developmental aviation platforms throughout the early development cycle from the public and non-participating aircraft. Emerging technologies continue to evolve rapidly in

complexity and mission and the use of these systems has taken an increasingly more prominent role in surveillance, data gathering, and combat missions. Unmanned aircraft systems (UAS) testing at YPG includes aircraft designs, propulsion systems, on-board instrumentation, guidance and operator systems, lasers, high power radars, day and night optical sensors, and weapons systems. Experimental weapons, sensors, and other external load requirements are also added to various airframes. The experimental nature of these systems means, by definition, that their safety is unproven (ATEC, 2013). This unproven safety record requires restricting the use of airspace to effectively test these complex integrated systems without posing a hazard to non-participating aircraft.

The SUA restricted area is also necessary for emergent experimental UAS with integrated weapons systems equipped with an independent Flight Termination System (FTS). While UAS platforms are not necessarily hazardous in and of themselves, the probability of mishap is increased during the developmental, test, and validation phase. Given the unpredictable nature and operational envelope of these developmental UAS systems, restricting use of airspace over existing infrastructure is essential in maintaining safety in the event of flight termination. These developmental UASs also integrate hazardous weapons and are often designed to incorporate a range-safety-approved, independent FTS. The FTS is not associated with the manufactured command and control link of the vehicle. Restricted airspace is necessary to provide the Range Safety Officer safe debris field footprint options within a controlled environment, should a vehicle termination command be required.

1.2.1.4 Increase Flexibility for Testing of Future Aviation and Weapons Systems

The proposed SUA restricted area would allow for greater flexibility in YPG testing programs. The aviation systems tested at YPG often require modifications to the aircraft or controlling software throughout the development cycle. The “fly, fix, fly” nature of these test programs requires that additional mitigations be put in place to reduce the risks associated with these modified hardware and software systems. The risks could include potential system malfunctions or failures. Currently, certificates of authorization must be obtained from the FAA each time modifications are made to aircraft or software operating system under test, reducing the efficiency of the iterative testing process.

The inclusion of LAAF within the SUA restricted area would provide YPG with control of the airspace utilized for aviation testing, which covers the ground space already controlled by YPG. This unified control of ground and air space would allow for greater flexibility between ground and airborne test operations while more uniformly confining and segregating hazardous operations from both ground-based and flying members of the public. This unified control would also enhance the ability to test emergent experimental aircraft systems at YPG.

1.3 Scope of Analysis

This EA supplements the 2008 *Final Environmental Assessment for the Unmanned Aircraft Systems Test Center* (YPG, 2008), which documented the analysis of the establishment and operation of the UAS Test Center at YPG. The 2008 EA discussed the impacts associated with expansion of existing test sites, construction of new test sites, and establishment of an SUA. However, the 2008 EA did not fully address the need for new SUA. In addition, the dimensions and size of the proposed SUA has changed from the area analyzed in the 2008 EA. The analysis in this Supplemental EA addresses the impacts resulting from the establishment and use of the proposed SUA and tiers from the 2008 EA.

This Supplemental EA has been developed by the U.S. Army, with the FAA serving as cooperating agency. This EA was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and NEPA-implementing regulations found at 40 Code of Federal Regulations (CFR) Parts 1500 through 1508 (Government Printing Office Access, 2009), 32 CFR 651 (Department of the Army, 2002), and FAA Order 1050.1E *Environmental Impacts: Policies and Procedures* (FAA, 2006). Its purpose is to inform decision-

makers and the public of the potential environmental impacts that could arise from the Proposed Action and alternatives on the human and natural environment.

The Proposed Action and alternatives, including the No Action Alternative, are described in Section 2. Conditions existing as of 2014, or “baseline” conditions, are described in Section 3. The potential impacts of the Proposed Action for each resource area are described in Section 4. The analysis focuses only on resource areas that could be affected by the Proposed Action. Resource areas eliminated from the analysis are discussed in Section 1.3.1. Section 4 also addresses the potential for cumulative impacts, and project design features to eliminate or reduce impacts are identified where appropriate. Section 5 presents the conclusions drawn from the analysis.

1.3.1 Resource Areas Eliminated from Analysis

The following resource areas have been eliminated from analysis in the EA because there is no potential for impacts to them from the Proposed Action. These resource areas will not be further discussed in the EA.

1.3.1.1 Land Use

The Proposed Action would occur in airspace over land currently designated and used for military testing and training activities. No modifications to existing explosive and weapons systems safety arcs would occur as a result of the Proposed Action and no changes in use of adjacent land would occur. There would be no changes to land use as a result of the Proposed Action.

1.3.1.2 Geology, Soils, and Mineral Resources

No ground disturbance would occur as a result of the Proposed Action. No new waste streams would be created by the Proposed Action and there would be little potential for the contamination of soils. Potential soils impacts associated with spills from aircraft operations, best management practices, and preventative measures are discussed in Section 3.5. No impacts to geology, soils, or mineral resources would be expected as a result of the Proposed Action.

1.3.1.3 Water Resources

It is unlikely that water resources would be affected by the Proposed Action. No ground disturbance would occur as the result of the Proposed Action and no washes, streams, or wetlands would be impacted. The Proposed Action would not result in an increase in use of water resources. No short- or long-term impacts to water resources would be expected as a result of the Proposed Action.

1.3.1.4 Cultural Resources

No Native American concerns or traditional cultural properties were identified that could be impacted by the Proposed Action. The Proposed Action does not have the potential to cause effects on historic properties because no ground-disturbing activities are included within the Proposed Action.

1.3.1.5 Socioeconomics

No construction, demolition, or relocation of personnel to or from YPG would occur under the Proposed Action. Although the short-term frequency of individual tests could increase and they could occur over a wider geographic area, the total amount of testing would not be expected to change. No socioeconomic impacts would be anticipated.

1.3.1.6 Environmental Justice and Protection of Children

Executive Order (EO) 12898 “Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations” requires that federal agencies analyze potential impacts to minority and low-income populations, including human health and environmental effects, resulting from their activities. The goal is to prevent minority and low-income communities from being subject to disproportionately high and adverse environmental effects. EO 13045 “Protection of Children from Environmental Health Risks and Safety Risks”

requires that federal agencies evaluate environmental health or safety risks that could disproportionately affect children. The Proposed Action would occur over land controlled by YPG, which is restricted from the public. During use, the general aviation population would not be utilizing the SUA. Only authorized personnel would be allowed in the area of the Proposed Action location. There would be no impacts to low-income populations, minorities, or children.

1.3.1.7 Ground Transportation

The Proposed Action would not require any changes to the ground transportation infrastructure on or around YPG and would not cause any disruptions to ground transportation. Once in operation, the Proposed Action would not affect traffic or ground transportation routes. Potential impacts to general aviation and air transportation are discussed in Section 3.6.

1.3.1.8 Utilities

No ground disturbance would occur as a result of the Proposed Action and no changes to any utilities would occur. The Proposed Action would not result in an increase in use of energy, water, wastewater management facilities, communications, or other utilities. No short- or long-term impacts would be expected as a result of the Proposed Action.

The EA will include an analysis of all other resource areas that could be impacted by the Proposed Action. These include the following, which are discussed in Sections 3 and 4:

- Air Quality
- Noise
- Biological Resources
- Air Transportation
- Hazardous and Toxic Substances
- Health and Human Safety
- Aesthetics and Visual Resources
- Recreation

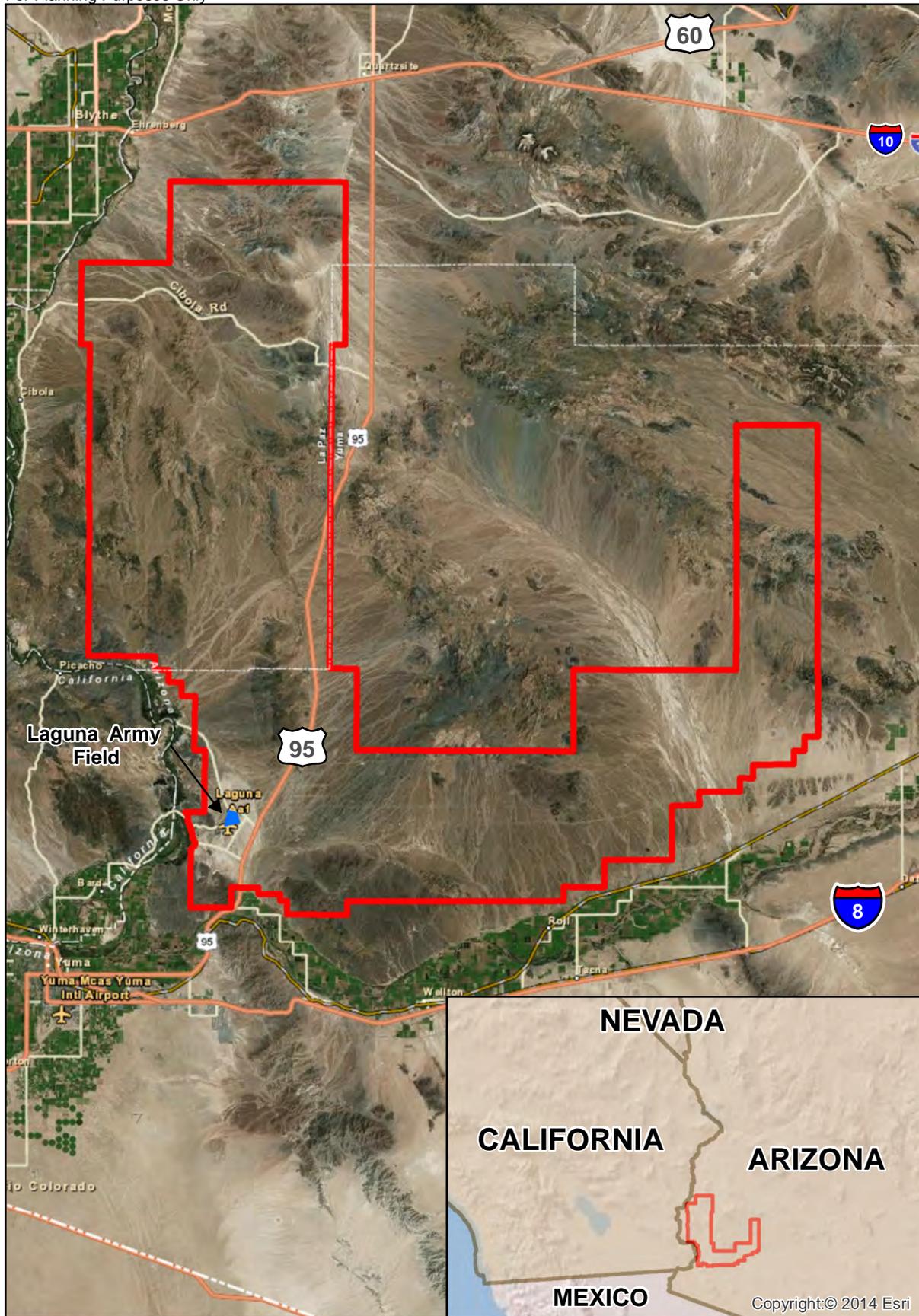
1.4 Agency and Public Participation

The U.S. Army invites public participation in the proposed federal action through the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision-making process. Coordination letters were submitted to potentially interested stakeholders, agencies, and tribal governments. Section 6 lists the entities contacted. Because the FAA administers the airspace that would be affected by the Proposed Action, it is participating in the NEPA process as a cooperating agency. A cooperating agency under 40 CFR Section 1508.5 is a federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved for major federal actions with the potential to significantly affect the quality of the human environment.

This EA has been prepared in support of the U.S. Army's special use airspace proposal and incorporates the FAA NEPA criteria, as contained in FAA Order 1050.1E and in FAA JO 7400.2K. Before the completion of the NEPA process, the U.S. Army will submit the aeronautical proposal to the FAA for review and processing. This will facilitate early consideration of aeronautical factors that may result in modification of the final SUA proposal, which in turn may affect the environmental analysis. The FAA will defer rulemaking (final decision) on the final SUA proposal until the NEPA process is completed. After the FAA has adopted this EA, as applicable, all FAA environmental requirements will have been satisfied. Please see Appendix 8 in FAA JO 7400.2K for SUA environmental processing procedures.

Public participation opportunities with respect to this EA and decision-making on the Proposed Action are guided by 32 CFR Part 651. Under 32 CFR Part 651.36, the completed EA and Draft Finding of No Significant Impact (FNSI) will be made available to the public for comment for a period of 30 days. At the end of the public review, the U.S. Army will consider all comments submitted by individuals, agencies, and organizations. As appropriate, the U.S. Army may then execute the FNSI and proceed with implementation of the Proposed Action. If it is determined that implementation of the Proposed Action would result in significant impacts, the U.S. Army would publish in the *Federal Register* a Notice of Intent to prepare an environmental impact statement or would not take the action.

Throughout this process, the public may obtain information on the status and progress of the Proposed Action and the EA through the YPG NEPA Program Manager via email to usarmy.ypg.imcom.mbx.nepa@mail.mil or by mail to U.S. Army Garrison Yuma, 301 C Street, IMYM-PWE, Yuma, AZ 85365-9498.



-  Yuma Proving Ground
-  Laguna Army Airfield

Imagery Source
ESRI Online\AEX 2006

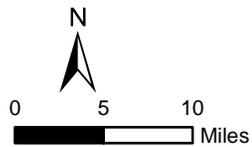
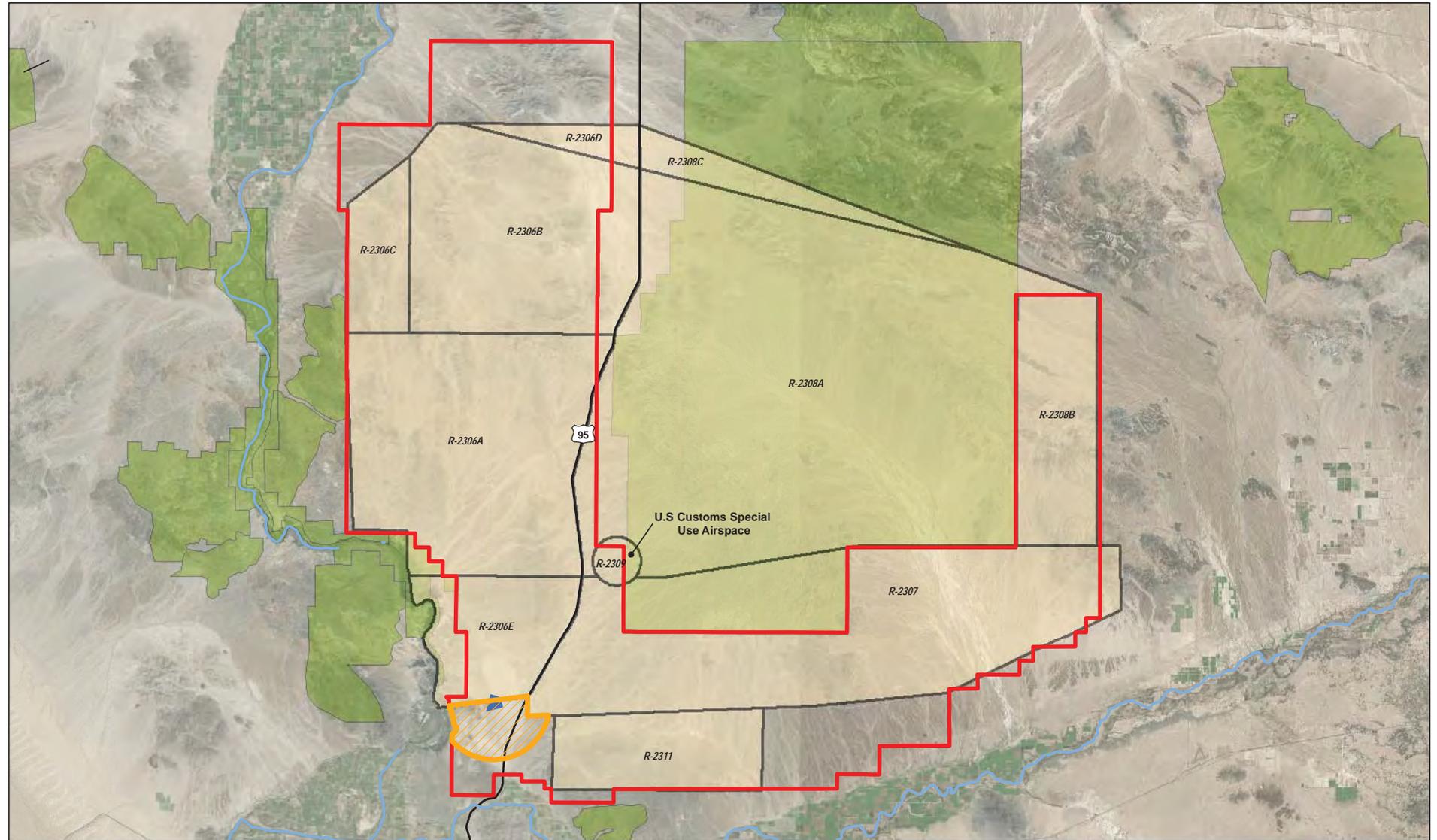


FIGURE 1-1
Project Location
Special Use Airspace Environmental Assessment
Yuma, Arizona



- River
- Restricted Area
- Proposed Special Use Airspace
- Highway
- Yuma Proving Ground
- Laguna Army Airfield

Imagery Source
ESRI Online/AEX 2006



0 5 10
Miles

FIGURE 1-2
Yuma Proving Ground Existing Special Use Airspace
Restricted Areas and Proposed Restricted Area
Special Use Airspace Environmental Assessment
Yuma, Arizona

SECTION 2

Description of Proposed Action and Alternatives

This section describes the Proposed Action and alternatives for establishment of an SUA restricted area at YPG. The Proposed Action is depicted in Figures 1-2 and 2-1. Reasonable alternatives were evaluated, using an interdisciplinary approach, against the following requirements:

- Ability to meet safety requirements for aircraft testing including setback distances for lasers and explosive ordnance
- Ability to use existing fixed infrastructure and fully support the aircraft testing program
- Compliance with FAA regulations on SUA

From this process, two alternatives (the Proposed Action and the No Action Alternative) were selected for detailed and equal analysis. In addition, two other alternatives were considered but were not carried forward due to constraints such as their inability to meet testing safety requirements.

2.1 Proposed Action

The Proposed Action is to establish a new SUA restricted area encompassing LAAF and an additional area to the south as depicted in Figure 1-2 and described below. The proposed SUA would be designated R-2306F Yuma, AZ, and would encompass the area between the surface up to, and including, an altitude of 1,700 ft MSL (1,267 feet AGL). It would extend in a horizontal arc to the south to a distance of 3.5 nautical miles centered from LAAF with the following proposed boundaries, which begin:

- at latitude 32 51 52 N, longitude 114 26 52 W
- to latitude 32 52 30 N, longitude 114 21 03 W
- to latitude 32 51 15 N, longitude 114 21 03 W
- to latitude 32 51 18 N, longitude 114 19 29 W
- clockwise along a 3.5-nautical-mile arc
- centered at latitude 32 51 52 N, longitude 114 23 34 W
- to latitude 32 49 30 N, longitude 114 26 39 W
- to latitude 32 49 51 N, longitude 114 26 38 W
- to latitude 32 50 08 N, longitude 114 26 33 W
- to latitude 32 50 17 N, longitude 114 26 19 W
- to latitude 32 50 31 N, longitude 114 26 17 W
- to latitude 32 50 42 N., longitude 114 26 29 W
- to latitude 32 51 11 N, longitude 114 26 34 W
- to the point of origin

The published time of use of the proposed SUA would be intermittent from 0600 to 1800 daily, Monday through Saturday, and other times by Notices to Airmen (NOTAM). The Controlling Agency would be the Yuma Approach Control, Marine Corps Air Station (MCAS), Yuma, and the Using Agency would be the Commander, YPG.

The proposed SUA restricted area would overlie existing YPG-owned land and would allow the installation to prevent exposure to hazardous non-eye-safe lasers, to provide appropriate safe explosive ordnance zones to non-participants (civilian aircraft, or other aircraft not directly involved with testing activities at YPG), and take advantage of land space and existing, fixed airfield infrastructure for experimental aircraft weapons tests.

The Proposed Action represents a modification from the airspace evaluated as part of the *Final Environmental Assessment for the Unmanned Aircraft Systems Test Center* (YPG, 2008). In that document the proposed SUA restricted area consisted of a 4-mile radius arc south of LAAF using the midpoint of the airfield [N32° 51' 36"; W114° 23' 48"] as the center point. The area abutted the southern boundaries of existing restricted use airspace at YPG (R-2306E to the west and R-2307 to the east).

2.2 No Action Alternative

Under the No Action Alternative, a new SUA restricted area would not be established. The public would remain at risk from testing activities involving non-eye-safe lasers, explosive ordnance, or testing accidents. Aircraft testing at YPG would continue to be performed in an inefficient manner.

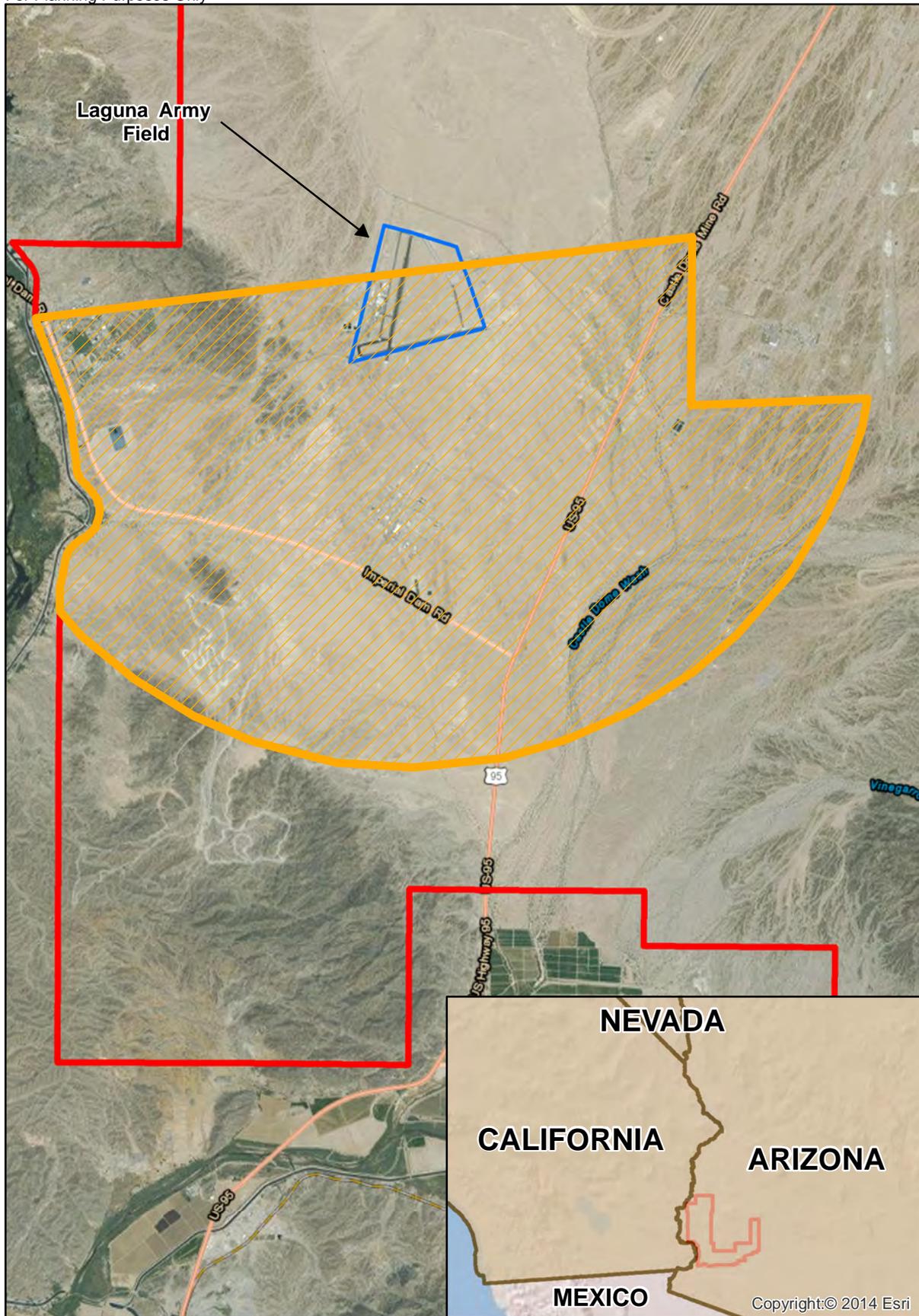
2.3 Alternatives Considered but Not Carried Forward

Two alternatives were evaluated for potential use but were not carried forward for detailed analysis. The alternatives were rejected because of one or more of the following constraints identified during the site-selection process:

- Incorrect size of airspace to provide required safe testing of aircraft and associated subsystems
- Inadequate infrastructure or size to accommodate all aircraft platforms

The site of the Proposed Action was the only location to meet the site selection requirements. The two rejected options are summarized below:

1. Use of a different size SUA at LAAF. The proposed SUA restricted area represents the minimum volume required for the safe testing of developmental weapon systems. Use of a smaller area would not meet safe set-back distances for laser systems or explosive ordnance and would put non-participants at risk in the event of a test vehicle or weapons failure. The upper limit of the proposed SUA represents the lowest altitude required for maneuver and weapons deployment.
2. Use of another airfield at YPG or establishment of SUA at different location. LAAF is the only airfield at YPG with the dimensions to handle the full variety of aircraft (e.g., rotary aircraft, jets, cargo planes, UAS) used for testing and training. Furthermore, this location contains existing testing and support infrastructure (e.g., hangers, paved runways and helipads, lasing targets, explosive operations facilities) that as a whole is not available in other locations at YPG. The use of other locations would require greater environmental impacts and costs associated with re-establishing testing infrastructure and operations. It would result in disruptions to other testing/test programs already occurring at other locations while simultaneously resulting in LAAF being underutilized.



-  Proposed Special Use Airspace
-  Yuma Proving Ground
-  Laguna Army Airfield

Imagery Source
ESRI Online\AEX 2006

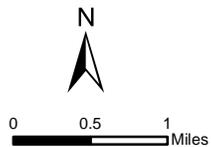


FIGURE 2-1
Project Location
Special Use Airspace Environmental Assessment
Yuma, Arizona

SECTION 3

Affected Environment

This section explains current baseline conditions for existing environmental resources at YPG that could be affected by the Proposed Action, if implemented. The potential consequences that could result from the Proposed Action are described in Section 4. Environmental resource areas discussed in detail in this section include: air quality, noise, biological resources, air transportation, hazardous and toxic substances, health and human safety, aesthetics and visual resources, and recreation.

3.1 Air Quality

3.1.1 Ambient Air Quality

Air quality is determined by the concentration of various pollutants in the atmosphere. The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. USEPA has established NAAQS for six criteria pollutants: sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (which includes inhalable particulate matter less than or equal to 10 micrometers in diameter [PM₁₀] and inhalable particulate matter less than or equal to 2.5 micrometers in diameter [PM_{2.5}]), carbon monoxide (CO), ozone (O₃), and lead (Pb). Primary NAAQS are intended to protect public health, while secondary NAAQS are intended to protect the environment (crops, wildlife, and buildings). Individual states may establish more stringent standards. The State of Arizona has adopted the Federal NAAQS. The primary and secondary NAAQS for the six criteria pollutants are presented in Table 3-1.

TABLE 3-1
NAAQS for Criteria Pollutants
Yuma Proving Ground

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ^a	None
	35 ppm (40 mg/m ³)	1-hour ^a	None
Lead	0.15 µg/m ³	Rolling 3-Month Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Average)	Same as Primary
	100 ppb	1-hour ^b	None
PM ₁₀	150 µg/m ³	24-hour ^c	Same as Primary
PM _{2.5}	12.0 µg/m ³	Annual ^d (Arithmetic Average)	15.0 µg/m ³
	35 µg/m ³	24-hour ^e	Same as Primary
Ozone	0.075 ppm	8-hour ^f	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	
	0.14 ppm	24-hour ^a	
		3-hour ^a	0.5 ppm (1300 µg/m ³)
	75 ppb	1-hour	None

TABLE 3-1
NAAQS for Criteria Pollutants
Yuma Proving Ground

Pollutant	Primary Standards	Averaging Times	Secondary Standards
	^a Not to be exceeded more than once per year.		
	^b 3-year average of the 98th percentile of daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb		
	^c Not to be exceeded more than once per year over 3 years.		
	^d 3-year average weighted annual mean PM _{2.5} concentration from single or multiple community-oriented monitors must not exceed 15.0 µg/m ³ .		
	^e 3-year average of the 98th percentile of 24-hour concentration at each population-oriented monitor must not exceed 35 µg/m ³ .		
	^f 3-year average of the fourth-highest daily maximum 8-hour average ozone concentration measured at each monitor within an area over each year must not exceed 0.0075 ppm.		
	µg/m ³ = micrograms per cubic meter mg/m ³ = milligrams per cubic meter ppb = parts per billion ppm = parts per million		

Source: EPA, 2012

Areas where ambient concentrations of a given pollutant are below the levels established in the NAAQS are designated as being in attainment for that pollutant. Areas that do not comply with the NAAQS for a given pollutant are classified as a non-attainment area for that pollutant. Non-attainment areas are regulated in an effort to lower pollutant ambient concentrations to regulatory standards.

A portion of Yuma County is designated as non-attainment (moderate) for the 24-hour NAAQS for PM₁₀. This non-attainment area includes the southwestern corner of the Laguna Region. Data from 2008 through 2010 show that no exceedances of the PM₁₀ standard occurred that were not the result of exceptional natural events. These data indicate that the entire county has moved into attainment with the 24-hour PM₁₀ standard (Arizona Department of Environmental Quality [ADEQ], 2011). At this time, EPA has not approved the ADEQ Yuma PM₁₀ Maintenance Plan (ADEQ, 2006) and the area remains classified as non-attainment.

3.1.2 Affected Environment

A majority of the proposed SUA would be within the Yuma County moderate PM₁₀ non-attainment area. The area is in attainment for the other criteria pollutants.

YPG has a Title V permit (Permit # 43492) dated June 17, 2010. YPG is classified as a major source with potential emissions of NO_x, CO, and volatile organic compounds (VOCs), each exceeding 100 tons per year (tpy). PM₁₀ emissions are less than 100 tpy. Additionally, YPG is an area source of hazardous air pollutants (HAPs) with emissions of a single HAP and facility-wide totals less than 10 tpy and 25 tpy, respectively. PM₁₀ emissions are generally derived from windborne dust particles, typically during high winds. Activities such as off-road travel and construction can exacerbate windborne erosion leading to increased PM₁₀ emissions. However, exceedances of the PM₁₀ standard have only occurred as a result of exceptional natural events.

Air emissions tracked on the installation consist of criteria air pollutants, VOCs, HAPs, and ozone-depleting chemicals (ODCs), (Gutierrez-Palmenberg, Inc., and Jason Associates Corporation, 2001). YPG is required to submit an annual air emissions inventory to ADEQ. Data from the YPG 2012 air emissions inventory are provided in Table 3-2 and are compared to Yuma County's total emissions for 2008 (the most recent year for which county data are available). YPG's point source emissions account for a very small fraction of Yuma County's total emissions.

TABLE 3-2
Comparison of Yuma Proving Ground Air Emissions to Yuma County Air Emissions ^a
Yuma Proving Ground

Pollutant	Yuma County ^b	Yuma Proving Ground	
	Total (tpy)	Point Source (tpy) ^c	% of Total
PM ₁₀	12,661	19.50	0.15
CO	34,765	5.73	0.02
VOC	8,203	17.57	0.21
NO _x	6,782	13.06	0.19
SO ₂	184	0.03	0.02

^a Data in this table are from the most recent available data (2008 and 2012).

^b Source: EPA, 2013. (The data are from 2008, which is the most recent data available).

^c Source: Yuma Proving Ground 2012 Annual Air Emission Inventory. (Obregon, 2013, personal communication)

The EPA Mandatory Reporting Rule became effective on December 29, 2009. Suppliers of fossil fuels or industrial greenhouse gases (GHGs), manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of CO₂ equivalent must submit annual reports to EPA. The Supreme Court decision in *Massachusetts et al. v. Environmental Protection Agency et al.* (Supreme Court Case 05-1120) found that EPA has the authority to list GHGs as pollutants and to regulate emissions of GHGs under the CAA. On April 17, 2009, EPA found that certain GHG emissions may contribute to air pollution and may endanger public health and welfare. YPG's GHG emissions are below the mandatory reporting threshold of 25,000 metric tons per year (Obregon, 2013, personal communication).

3.2 Noise

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although exposure to very high noise levels can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, type of activity during which the noise occurs, and the sensitivity of the individual. The Noise Control Act of 1972, as amended by the Quiet Communities Act (42 U.S. Code 4901 et seq.), provides guidelines and regulations for noise. Chapter 7 of AR 200-1 dictates guidelines and regulations to reduce noise impacts and establishes an Environmental Noise Management Program.

YPG has an Installation Operational Noise Management Plan (IONMP) to guide operations. The IONMP describes the current noise environment and predicts future noise conditions through computer modeling. The IONMP provides guidelines to attain land use compatibility between noise generated by military activities on YPG and the surrounding communities (U.S. Army Public Health Command, 2011). An annual evaluation and 5-year updates of the IONMP are recommended by the U.S. Army Public Health Command. The IONMP does not include potential noise impacts from UAS operations.

Army environmental noise policies are based on land use compatibilities as indicated by objective noise levels. A number of noise measurements are used to assess compatibility, including the following:

- Decibel (dB): A measurement of the sound pressure level.
- dBA (A-weighted sound pressure level): Sound pressure level adjusted by an A-weighting filter that places greater emphasis on those frequencies within the sensitive range of the human ear by de-emphasizing the very low and very high frequency components. Typically, human hearing is best approximated by using a dBA scale (EPA, 1974). For activities on YPG, noise generated by transportation

sources (such as vehicles and aircraft) and from continuous sources (such as generators) is assessed using an A-weighted day-night average noise level (ADNL). The yearly day-night average noise level (YDNL) is used for aircraft noise and is calculated over 365 days.

- **dbc (C-weighted sound pressure level):** Sound pressure level adjusted by a C-weighting filter, which emphasizes the very low frequency components of sound. For activities on YPG, impulsive noise generated by armor, artillery, and demolition activities is assessed using a C-weighted average day-night noise level (CDNL). The CDNL is calculated over a “training year,” which is typically 250 training days for active military.
- **Peak (PK):** The peak or maximum, single event sound level measurement without weighting. This measurement includes the effects of everything from berms, to weather, to the length of grass on the noise, but is only accurate for a specific moment under the specific conditions at that point in time.
- **PK15 (met):** The peak sound level, using statistical variations caused by weather that is likely to be exceeded only 15 percent of the time. The PK15 (met) accounts for 85 percent of all meteorological conditions including those favorable to sound propagation. PK15 (met) is used for land use planning with small-caliber munitions and is used to supplement land use planning for large-caliber munitions and other impulsive sounds.

The decibel scale is logarithmic rather than arithmetic. When sound pressure doubles, the sound pressure level, as expressed by dBA, increases by 3. Psychologically, most humans do not perceive a doubling of sound until there is an increase of 10 dBA (EPA, 1974). Sound pressure decreases with distance from the source. Typically, the amount of noise from a continuous source is halved (reduced by 3 dBA) as the distance from the source doubles (EPA, 1974).

Using the noise measurement scales described above, Installation Compatible Use Zones (ICUZs) have been established for YPG based on the level of noise exposure in three types of areas, designated as Noise Zones (NZs). NZ I has the least noise exposure and NZ III having the greatest (Table 3-3). The intent of ICUZ is to prevent land use incompatibilities as a result of placing noise-sensitive activities in high-noise exposure areas. Generally, all types of land use are suitable in NZ I. NZ II is typically limited to activities such as manufacturing, warehousing, transportation, and resource protection and is not recommended for noise-sensitive land uses. No noise-sensitive land uses are recommended in NZ III. The Land Use Planning Zone, where noise-sensitive land uses are acceptable, is defined within the upper range of noise levels in NZ I. Noise levels at LAAF do not exceed 65 dB YDNL at current operational levels (U.S. Army Public Health Command, 2011).

TABLE 3-3
YPG Installation Compatible Use Zones
Yuma Proving Ground

Noise Zone	Aviation (YDNL)	Impulsive, Large Caliber, Demolitions, etc. (CDNL)	Small Caliber (PK)
Land Use Planning Zone	60 to 65 dBA	57 to 62 dBC	N/A
I	Less than 65 dBA	Less than 62 dBC	Less than 87 PK
II	65 to 75 dBA	62 to 70 dBC	87 to 104 PK
III	More than 75 dBA	More than 70 dBC	More than 104 PK

Source: U.S. AR 200-1, Chapter 7 Environmental Noise Management Plan

Physiological hearing damage to the human ear using the PK threshold occurs at approximately 140 dB, but the threshold for annoyance varies among individuals. PK levels are typically used to determine annoyance levels instead of averages to show with 85 percent certainty how loud a single event at a particular location might get. Table 3-4 shows the risk of complaints generally from small-caliber noise events.

TABLE 3-4
 Anticipated Risk of Noise Complaints from Predicted Peak Sound Levels
Yuma Proving Ground

Predicted Sound Level PK (dB)	Risk of Noise Complaints
less than 115	Low risk of complaints
115 to 130	Moderate risk of complaints
more than 130	High risk of complaints

Source: U.S. Army Public Health Command, 2011

Vibrations could become a concern to homeowners as a result of structural rattling and the potential for structural damage when the PK from an activity exceeds 120 dB. However, structural damage generally does not occur when the PK is below 150 dB (U.S. Army Public Health Command, 2011). The general public may be annoyed by noise levels from aircraft, with louder aircraft having a greater probability of causing annoyance (Table 3-5).

TABLE 3-5
 Percentage of Public Likely to be Highly Annoyed by Aircraft Noise
Yuma Proving Ground

Maximum Level (dBA)	Percentage Highly Annoyed
70	5%
75	13%
80	20%
85	28%
90	35%

Source: U.S. Army Public Health Command, 2011

Ambient noise on YPG includes natural sources, such as wind, and man-made noises, such as aircraft noise, traffic on US 95 and other roads, munitions testing, military vehicle and equipment testing, and military training activities. Aircraft noise includes fixed- and rotary-wing military aircraft from YPG and MCAS Yuma, Arizona Game and Fish Department (AZGFD) wildlife surveys, and commercial air traffic. The main noise sources on YPG are related to transportation, aviation, and firing activities. The IONMP indicates that all NZ II and NZ III contours are contained within the YPG boundary, except for (YPG-DPW, 2010):

- Three small areas extending into the southern portion of the Kofa NWR from noise generated in the Kofa Range
- A small area to the east of the Cibola Range around the North Unmanned Aerial Vehicle (UAV) Complex and the Tyson Drop Zone, that is more than two miles from US 95

YPG personnel use the Kofa and Cibola Regions for testing and training, and portions of these areas not used for testing and training may be used for limited recreational hunting use. Both regions are unpopulated and contain no permanent sensitive receptors.

The only noise-sensitive land uses surrounding YPG are the Martinez Lake area on the Colorado River near the western boundary of the Cibola Range and the Dome Valley agricultural/rural residential area to the south of the Laguna Region. The majority of land within NZs where a risk of complaint exists consists of open space, agricultural, recreational, and un-zoned land, and land managed by the U.S. Bureau of Land Management (BLM) (U.S. Army Public Health Command, 2011).

The Kofa NWR, Kofa Wilderness, Trigo Mountain Wilderness Area, Imperial NWR, Imperial Refuge Wilderness, and the Muggins Mountain Wilderness Area are considered sensitive noise receptor areas around YPG due to their proximity to firing ranges and the use of airspace over these areas for military testing and training (Gutierrez-Palmenberg, Inc. and Jason Associates Corporation, 2001). The Arizona Desert Wilderness Act of 1990 (Public Law 101-628), established the Muggins Mountain Wilderness Area, Trigo Mountain Wilderness Area, Kofa Wilderness Area, and Imperial Refuge Wilderness Area, among other Arizona desert wilderness areas. This Act does not preclude or otherwise affect continued low-level over flights by military aircraft over NWR wilderness areas and does not preclude the designation of new units of special airspace, or the use or establishment of military flight training routes over wilderness areas. The Act also states that the ability to see or hear non-wilderness activities or uses from areas within a wilderness does not preclude such activities or uses up to the boundary of the wilderness area. A letter dated December 3, 1958, from the Secretary of the Interior granted permission to YPG to use 171,000 acres of Kofa NWR as an artillery fire buffer zone (YPG, 2012).

YPG implements a noise complaint management procedure, which provides guidance to those responsible for handling noise complaint issues. The facility point of contact for noise complaints has the following responsibilities:

- Receive noise complaints and complete Noise Complaint Questionnaire while talking to the complainant.
- Investigate complaint-causing activities with personnel involved in activities described in the complaint. Determine if the complaint involved mission-related activities or non-routine tasks, and whether any unusual circumstances existed that may have caused the incident.
- Notify and forward copies of completed Complaint Forms to the YPG Public Affairs Office (PAO) and the YPG Environmental Department within 24 hours of completion, or on the first business day after receiving the complaint.

The YPG PAO has the following responsibilities:

- Review all reported noise complaints.
- Assist units and facility managers in responding to complaints and any required follow-up to resolve public concerns to the maximum extent practicable.
- Maintain a log of all noise complaints for future reference.

The YPG Environmental Department reviews noise complaints and coordinates responses with the YPG PAO.

YPG typically receives fewer than five complaints per year. YPG receives complaints about airplane overflight noise and from bombing activities at the Barry M. Goldwater Range, which is southeast of Yuma. A majority of aircraft-related noise complaints have been attributable to aircraft operating from MCAS Yuma rather than aircraft from YPG. Persons raising these issues have been informed of the situation and advised to redirect the complaint to appropriate offices at MCAS Yuma or the Barry M. Goldwater Range (U.S. Army Public Health Command, 2011).

To reduce the risk of complaints, YPG implements a noise abatement program that is specified in Annex T of the LAAF Standard Operating Procedure, dated November 1, 2010. The noise abatement program identifies the following areas where overflights should be conducted a minimum of 2,000 ft AGL:

- Howard Cantonment Area (HCA), mainly the housing and school area
- Hidden Shores RV Park
- Martinez Lake area (includes Fisher's Landing Village and the MCAS Yuma Recreation Area)
- Imperial NWR

- Kofa NWR

3.3 Biological Resources

Wildlife on YPG is typical of the Colorado Desert, which is a subdivision of the Sonoran Desert. Common wildlife species usually have physical and behavioral adaptations to survive the extreme hot and dry conditions that may include light coloration, body armoring, and increased surface area of heat-dissipating body parts. Many species also demonstrate nocturnal behavior to avoid the hot daytime temperatures. Mammal, reptile, and bird species are well represented, while fish are limited to perennial waterbodies such as the Colorado and Gila rivers or those introduced to industrial use ponds. Amphibians are restricted to xeric riparian areas or are emergent after rain events. Birds would be the main biological resource of concern relating to the Proposed Action, and are discussed below.

3.3.1 Birds

The Migratory Bird Treaty Act of 1918 (MBTA) established federal responsibilities to protect birds migrating between the United States and Canada. Later amendments implemented treaties with Mexico (1936), Japan (1972), and the Union of Soviet Socialist Republics (1976) expanded the scope of international protection of migratory birds. Each subsequent treaty was incorporated into the MBTA as an amendment. The provisions of the MBTA are implemented domestically within the signatory countries. Under the MBTA, nearly all species of birds occurring in the United States, their eggs, and their nests are protected. There are 836 bird species protected by the MBTA in the United States, 58 of which are legally hunted as game birds. The MBTA makes it illegal to take (to hunt, pursue, wound, kill, possess, or transport by any means) listed bird species, their eggs, feathers, or nests unless otherwise authorized, such as within legal hunting seasons (USFWS, 2011a). The *National Defense Authorization Act of 2003* authorizes the Armed Forces to take migratory birds incidental to military readiness activities, subject to certain limitations.

The Bald and Golden Eagle Protection Act of 1940, as amended, makes it illegal to take, transport, or possess bald and golden eagles or to engage in commerce in these species with limited allowed exceptions (USFWS, 2011b).

YPG supports an abundant and diverse avifauna typical of the Colorado Desert. All native species occurring on YPG are protected under the MBTA. Common resident birds include the Gambel's quail (*Callipepla gambelii*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-throated sparrow (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), black-tailed gnatcatcher (*Poliophtila melanura*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), and red-tailed hawk (*Buteo jamaicensis*) (YPG, 2012).

The white-winged dove (*Zenaida asiatica*) and mourning dove (*Zenaida macroura*) are seasonally abundant on YPG, and many other species migrate through the area as part of the general Pacific Flyway. Surveys conducted in North Cibola Region and East Arm indicated that certain bird species were locally abundant in specific habitats. The rock wren (*Salpinctes obsoletus*) and canyon wren (*Catherpes mexicanus*) were found to be common in high-elevation montane habitats dominated by palo verdes and mixed cacti plant communities and two other species, the Costa's hummingbird (*Calypte costae*) and phainopepla (*Phainopepla nitens*), also were seasonally abundant in montane habitats. The sage sparrow (*Amphispiza belli*), LeConte's thrasher (*Toxostoma lecontei*), and horned lark (*Eremophila alpestris*) were identified as typical residents of the sparsely vegetated lower bajadas dominated by creosote bush and bursage or big galleta plant communities (YPG, 2012).

In the Colorado Desert, the greatest bird use occurs along washes due to greater availability of water and increased habitat diversity (Phillips and Comus, 2000). On YPG, the large washes with bosques of foothills palo verde and smoketree plant associations support the highest densities and richest diversity of desert bird species. Desert washes make up 5 percent of the habitat on YPG, but account for 90 percent of desert birdlife. Common residents of these washes include the lesser goldfinch (*Carduelis psaltria*), common

yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*). Lucy's warbler (*Vermivora luciae*) and yellow warbler (*Dendroica petechia*) are seasonal migrants species also commonly observed in these habitats (YPG, 2012).

Golden eagles are known to occur on YPG. The high cliffs in the mountainous regions of YPG provide suitable nesting habitat for this species. Surveys conducted by Arizona Game and Fish Department (AZGFD) in 2012 and 2014 at YPG identified potential nests but were unable to confirm any as active (AZGFD, 2014). Nesting by golden eagles has been reported on the Kofa NWR (YPG, 2012). Bald eagles are occasionally observed along the Colorado River.

3.3.2 Threatened and Endangered Species

Sonoran (Morafka's) Desert Tortoise

On December of 2010, the USFWS designated the "Sonoran" population (desert tortoises that occur east and south of the Colorado River) of the desert tortoise (*Gopherus agassizii*) as a Candidate species for listing as Threatened or Endangered. Since that decision, this population of desert tortoise was proven to be a genetically distinct species and has been named Morafka's desert tortoise (*Gopherus morafkai*) (Murphy et al., 2011). According to the USFWS, recognizing the Sonoran desert tortoise as a new species confirms the USFWS decision to evaluate this population independently from the Agassiz's desert tortoise and will not change the status of either species under the Endangered Species Act (ESA) or change existing recovery plans (U.S. Department of Interior, 2011). The AZGFD classifies the Sonoran desert tortoise as a "Species of Greatest Conservation Need." A low density population of Sonoran desert tortoises has been known to occur on YPG, particularly on the East Arm portion and throughout northern Cibola Range.

Sonoran Pronghorn

The USFWS and AZGFD have implemented a project to re-establish the endangered Sonoran pronghorn (*Antilocarpa americana sonoriensis*) within its historic range, which includes the Kofa NWR, parts of the Barry M. Goldwater Range, and YPG. As part of the re-introduction, the Sonoran Pronghorn Recovery Team has built a captive-breeding pen for Sonoran pronghorn within the central portion of Kofa NWR. This population is classified as a nonessential experimental population under section exception 10 (j) of the ESA.

On January 2013, the USFWS released 9 Sonoran pronghorn from the captive-breeding pens into King Valley in the Kofa NWR. In 2014 they released an additional 24. Pronghorn released from the captive breeding pens may be encountered on YPG in the Eastern Kofa Region which is over 25 miles from the proposed project. However, since this population is classified as a nonessential experimental population the exception 10(j) take of pronghorn from the nonessential experimental population area is allowed on YPG: "...when it is incidental to, and not the purpose of, carrying out an otherwise lawful activity within the boundaries of YPG..." (USFWS, 2010). The only requirement on DOD lands is to report to the USFWS if incidental take occurs within one of the designated population areas because of military operations (USFWS, 2010).

For the purposes of Section 7 consultation, 10 (j) species are treated as if they are proposed for listing which requires conferencing on any project likely to jeopardize the continued existence of the species. Because the nonessential experimental population is, by definition, not essential to the continued existence of the species, conferencing would not be required (USFWS, 2010).

Southwestern Willow Flycatcher

Southwestern willow flycatchers (*Empidonax traillii extimus*) are typically found in riverine habitat, especially within significant willow habitat. Although critical habitat for this species has been identified in Yuma County along the Colorado River, there is no riverine habitat near the project area, and therefore this species would not be affected by the proposed action.

Yuma Clapper Rail

Yuma clapper rails (*Rallus longirostris yumanensis*) are typically found in fresh-water marshes dominated by cattail or bulrush. Critical habitat within Yuma County has not been established for this species. The proposed action areas fall outside of any marsh land habitat therefore this species will not be affected by the proposed action.

Yellow Billed Cuckoo

The western population of yellow-billed cuckoo (*Coccyzus americanus*) has been proposed for listing as a threatened species by the USFWS and Critical Habitat is proposed along the Colorado River and associated wetlands west of YPG. Western cuckoos breed in large blocks of riparian habitats, particularly woodlands with cottonwoods (*Populus fremontii*) and willows (*Salix* sp.). The proposed action areas fall outside of any wetland or woodland habitat therefore this species will not be affected by the proposed action.

3.4 Air Transportation

The Yuma International Airport, which shares facilities with MCAS Yuma, is located approximately 26 miles south of YPG and offers air service via commercial carriers. This airport is capable of accommodating most commercial and military aircraft. MCAS Yuma is an aviation training base for the Marine Corps and is used to support 80 percent of the Corps' air-to-ground aviation training. The airfield also hosts other military units from U.S. and NATO forces (MCAS Yuma, 2015). Air access into YPG is restricted to military and government use. Airspace over YPG and surrounding areas is restricted.

Additional airports in Paz and Yuma counties used by general aviation aircraft include Rolle Airfield in San Luis and Avi Suquilla Airport in Parker (AZDOT, 2014). Other nearby airports supporting general aviation include Blythe Airport in Riverside County, California (FAA, 2015a).

Within the installation, YPG operates LAAF and the CDH in support of military flight operations and aircraft test projects. LAAF has two 6,000-ft runways (150-ft wide N-S runway and adjacent 100-ft wide E-W runway) serving rotary-wing and fixed-wing aircraft, including C-130, C-5, and C-17 cargo aircraft. LAAF provides 24-hour mission support on an as-needed basis. During peak summer temperatures, aircraft are restricted to 40 percent of their gross maximum weight. LAAF is the only airfield on YPG that has sufficient length and width to support Predator family and larger UAS airframes (YPG, 2014).

The CDH, located in the Laguna Region, has a 4,400-ft runway and supports rotary-wing aircraft and UAS testing. CDH has four helipads to accommodate aircraft parking. The facility also includes a taxiway and support facilities. UAVs also are supported at several test runways located in the Cibola Region.

There are no helipads within the Yuma Test Area or Kofa Firing Range. There is a helipad at the Castle Dome Annex, two within the Indian Wash Test Area, one near the Detection and Recognition Target Array, one at CM-1, three at Inverted Range Control Center, three at Comanche Flats, one at 4K pad, and one at Cobra Flats Aviation Test Facility. There are three steel-mat helipads within the Cibola Range Complex. In addition, there is one serviceable emergency helipad at the HCA.

Airspace Management

Airspace in the United States is managed as either controlled or uncontrolled. Controlled airspace is airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements. Airspace in the United States is designated based on location and use. Classes of airspace are defined in FAA Order JO 7200.2K and summarized below (FAA, 2014):

- Class A Airspace Area: airspace from 18,000 ft MSL up to and including FL 600, including the airspace overlying the waters within 12 nautical miles of the coast.

- Class B Airspace Area: airspace from the surface to 10,000 ft MSL surrounding the nation's busiest airports.
- Class C Airspace Area: airspace from the surface to 4,000 ft above the airport elevation (charted in MSL) surrounding lower-activity commercial airports.
- Class D Airspace Area: airspace from the surface to 2,500 ft above the airport elevation (charted in MSL) surrounding airports that have an operational control tower.
- Class E Airspace Area: airspace that is not Class A, Class B, Class C, or Class D, and is controlled airspace, is classified as Class E airspace. Class E airspace areas include surface areas designated for an airport and extensions to surface areas, transition areas and en route areas, and Federal Airways. Unless designated at a lower altitude, Class E airspace begins at 14,500 ft MSL to, but not including 18,000 ft MSL and excluding the airspace below 1,500 ft above the surface of the earth unless specifically designated.
- Class G Airspace Area: uncontrolled airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace (FAA, 2014).

All aircraft operating within Class A, B, C and D airspace must be in contact with the air traffic control facility responsible for the particular airspace. The U.S. Marine Corps operates the Yuma FAA air traffic control sector, which includes airspace over YPG. The MCAS Yuma Air Traffic Control Division is responsible for military and civilian air traffic operating into and out of MCAS Yuma / Yuma International Airport, assigned National Airspace, and designated SUA. This includes MCAS Yuma's Class D airspace, which extends to a 5-nautical-mile radius from the center of the air station from surface to 2,700 ft MSL. MCAS Yuma is also responsible for airspace within a 60 nautical mile radius of the air station from the surface to 23,000 ft MSL and within designated SUA up to 80,000 ft MSL (USMC, 2015).

MCAS Yuma schedules airspace in the greater Yuma region and manages the restricted airspace over YPG at its Yuma Range, upon release of the airspace by YPG. This arrangement allows flight training opportunities for all services in Arizona, California, and elsewhere. Private or commercial flights may use YPG restricted airspace during periods of non-use by YPG or other military users, with proper clearance. Special use airspace is the designation for airspace in which certain activities must be confined, or where limitations may be imposed on aircraft operations that are not part of those activities. SUA categories are defined in FAA Order JO 7400.8 and summarized below:

- Prohibited Areas: areas within which the flight of aircraft is prohibited.
- Restricted Areas: airspace where aircraft flight is subject to restrictions. These areas contain hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles.
- Warning Areas: airspace extending from three nautical miles outward from the coast of the U.S. that contains activity that may be hazardous to nonparticipating aircraft.
- Military Operations Areas: airspace established for the purpose of separating certain military training activities from instrument flight rules (IFR) traffic. When in use nonparticipating traffic may be cleared through a MOA if separation can be provided, rerouted, or restricted.
- Alert Areas: areas are depicted on aeronautical charts to inform nonparticipating pilots of areas that may contain a high volume of pilot training or an unusual types of aerial activity.
- Controlled Firing Areas: areas containing activities that, if not conducted in a controlled environment, could be hazardous to nonparticipating aircraft. Within these areas, activities are suspended immediately when spotter aircraft, radar, or ground lookout positions indicate an aircraft might be approaching the area.

- **National Security Areas:** airspace established at locations where there is a requirement for increased security and safety of ground facilities. Pilots are requested to voluntarily avoid flying through these areas. Flights in these areas may also be temporarily prohibited (FAA, 2015b).

There is restricted military airspace over most of YPG, which includes approximately 2,000 square miles of designated restricted airspace. This restricted military airspace also extends over most of the Kofa NWR (Figure 1-2; Table 3-6). The majority of YPG restricted airspace is used for test missions; however, the U.S. Department of Homeland Security operates a Special Use Airspace R-2309, which restricts military mission access as well as commercial use. Outside of the Department of Homeland Security Special Use Airspace, the restricted airspace on YPG is prioritized for testing and training conducted at the installation.

TABLE 3-6
Restricted Areas
Yuma Proving Ground

Airspace Area	Description
R-2306A	Covers the southern part of the Cibola Region from the surface to 80,000 ft
R-2306B	North of R-2306A in the Cibola Region, from the surface to 80,000 ft
R-2306C	West of R-2306B in the Cibola Region, from the surface to 40,000 ft
R-2306D	North of R-2306B in the Cibola Region, from the surface to 23,000 ft
R-2306E	South of R-2306A in the Cibola and Laguna Regions, from the surface to 80,000 ft
R2307	Laguna and Kofa Regions west of US 95 and north of Pole Line Road, from the surface to unlimited. Also includes the southern portion of the Kofa NWR
R2308A	Kofa NWR from 1,500 ft AGL to 80,000 ft
R2308B	West of R-2308A in East Arm, from the surface to 80,000 ft
R2308C	North of R-2308A in Kofa NWR from 1,500 ft AGL to 23,000 ft
R-2309	Department of Homeland Security Special Use Airspace. 1.5-mile radius from the surface to 15,000 ft, north of CDH
R-2311	Eastern Kofa Region south of Pole Line Road from the surface to 3,500 ft

LAAF is on the southern boundary of Restricted Area R-2306E. Large extents of restricted airspace operated by YPG occur north and east of LAAF. The boundary of R-2306E crosses the north-south runway of LAAF. The south terminus of the north-south runway is within the FAA National Airspace Systems, which prevents southerly departures of hazardous natures, such as UAS testing and training operations, from occurring at LAAF without Certificate of Authorization (YPG, 2008; YPG, 2014). The airspace around LAAF that is not restricted is Class D airspace. Class D airspace is not operated the same as restricted airspace and does not deny the public's right of access (YPG, 2014). Class D airspace requires each aircraft to establish two-way radio communications with air traffic control prior to entering the airspace and must maintain communication while in the airspace (FAA, 2015a).

YPG restricted airspace allows testing of UASs and weapons systems, such as mortars and rockets, without risk to non-military aircraft. Secondary priority for use of this restricted airspace is for other military users. Additional SUA restricted areas and military operations areas (MOAs) used by for other Department of Defense installations (e.g., MCAS Yuma and Luke Air Force Base) are located near YPG. The nearest of these areas are located approximately 4 miles to the south, 5 miles to the north, and 15 miles to the west of YPG's boundaries. Nearby restricted areas include R-2031W and R-2031E to the south and R-2512 and R-2507S, R-2507E, R-2507N to the west. Nearby MOAs include Dome MOA to the south, Able MOA to the west, and Quail and Gladden MOAs to the north (FAA, 2015a).

3.5 Hazardous and Toxic Substances

This section focuses on hazardous and toxic substances related to airfields and UASs. Other types of hazardous areas or materials, such as, Installation Restoration Program areas, ordnance, open burn/open detonation for waste munitions, pesticides and herbicides, asbestos, lead, and polychlorinated biphenyls (PCBs) are not discussed in detail because there would be no impacts to these resources as a result of the Proposed Action.

3.5.1 Background

Hazardous substances are defined as any of the following: any substance designated pursuant to Section 311 (b)(2)(A) of the Clean Water Act ; any element, compound, mixture, solution, or substance designated pursuant to Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); any hazardous waste having the characteristics identified under the Resource Conservation and Recovery Act; any toxic pollutant listed under the Toxic Substances Control Act (TSCA); any HAP listed under Section 112 of the CAA; or any imminently hazardous chemical substance or mixture on which the EPA Administrator has taken action pursuant to Subsection 7 of the TSCA. A list of hazardous substances is found in 40 CFR 302.4.

Environmental programs at YPG use management actions to minimize use of hazardous substances and reduce resulting waste streams. Chapter 3 of YPGR 385-1 addresses environmental health risks and applies to all activities on YPG. Strict spill prevention requirements add additional protection for human health and the environment. Industrial processes, routine maintenance activities, testing, and support activities are the primary operations on YPG that use hazardous substances or generate wastes (YPG-DPW, 2010).

No hazardous substances or waste are permanently stored, treated, or disposed of at any of the off-post locations used by YPG. Transport of hazardous substances is in accordance with legal requirements. Periodic audits are conducted at YPG facilities where hazardous substances are used and all hazardous substance use is tracked through the Hazardous Material Control Center using the Hazardous Substances Management System. These audits serve as a tracking system for hazardous substance use. In addition to obtaining material usage amounts, storage and containment are investigated. Emphasis is placed on the prevention and control of spills.

3.5.2 Hazardous Substances Management

YPG uses a Hazardous Waste Tracking System for all hazardous wastes generated through industrial activities. Hazardous wastes at YPG are managed successfully through the Hazardous Waste Storage Facility (HWSF) located in the Walker Cantonment Area (WCA). Hazardous wastes and expired hazardous substances accumulate at this location until disposal. No wastes from outside YPG are accepted at the HWSF and no treatment or permanent disposal of wastes occurs at the HWSF. Hazardous substances are stored according to Army regulations and all applicable federal, state, and local ordinances and then disposed of properly in appropriate facilities (YPG, 2012).

3.5.3 Fuels and Petroleum Products

Fuels at YPG are stored in aboveground storage tanks (ASTs) and underground storage tanks (USTs) for use on the installation. There are 22 ASTs at YPG with a total capacity of 139,298 gallons (Brandon, 2011, personal communication). These ASTs primarily are used for storage of fuel oil, used oil, aviation fuel, gasoline, or diesel fuel. Many of the ASTs have secondary containment structures to prevent release to the environment in the event of a spill (Gutierrez-Palmenberg, Inc., and Jason Associates Corporation, 2001). USTs on the installation primarily contain Jet Propellant 8 (JP-8), heating oil, or gasoline. YPG maintains 20 active USTs with a total storage capacity of 27,569 gallons for this purpose (Brandon, 2011, personal communication; Gutierrez-Palmenberg, Inc., and Jason Associates Corporation, 2001). Petroleum, oil, and lubricants, including fuels, are stored either in USTs or ASTs

YPG recycles used oils, which are collected in ASTs and stored in labeled 55-gallon drums. The used oil is picked up by a private contractor for recycling. Control practices such as oil/water separators attached to vehicle wash racks minimize the potential for discharge from normal operations.

3.5.4 Solvents

Solvents are used for parts cleaning during routine maintenance of vehicles and weapons systems. The two most commonly used solvents are Safety-Kleen® solvent and PD680 (Stoddard solvent). Most maintenance activities use Safety-Kleen® solvent, while PD680 is used in aircraft and vehicle maintenance. Safety-Kleen® cold degreasing tanks are located in various buildings on YPG, and degreasing tanks are equipped with a solid stream dispensing nozzle and an interior drain rack. Safety-Kleen® solvent is reclaimed by Safety-Kleen® Corporation on a quarterly basis and pickup manifests are maintained. PD680 is maintained in a cold cleaner immersion tank with an enclosed design in aircraft maintenance areas (Gutierrez-Palmenberg, Inc., and Jason Associates Corporation, 2001).

3.5.5 Spill Containment

The installation fire department can provide emergency response in the event of a large spill. The RCRA Contingency Plan and the Spill Prevention Control and Countermeasures Plan provide information on the storage and handling of petroleum-based products, hazardous substances, and appropriate response actions in the event of fire, explosion, or release of hazardous substances and wastes.

3.5.6 Disposal

The Universal Waste Rule issued by EPA (40 CFR 273) is designed to reduce the amount of hazardous waste items in the municipal solid waste stream, encourage recycling and proper disposal of certain common hazardous wastes, and reduce the regulatory burden on businesses that generate these wastes. The rule is intended to promote recycling of batteries, mercury-containing thermometers, and recalled pesticides by relaxing collection, handling, and transportation requirements; and to make it easier to properly treat and recycle these wastes. YPG coordinates with MCAS Yuma and other government agencies to consolidate wastes that are subject to the Universal Waste Rule to increase the cost-effectiveness of recycling and disposal of the waste.

3.6 Health and Human Safety

The main safety concerns related to the Proposed Action would include air traffic control and management within the proposed SUA above LAAF. YPG has approximately 2,000 square miles of restricted airspace that allows for the safe, proper, and complete testing and evaluation of emergent experimental aviation platforms and their associated subsystems; however, the airspace south of LAAF, within the proposed SUA area, is not restricted. Aviation systems tested at YPG serve as platforms for various subsystems integration as they progress through the development cycle. This includes subsystems that pose safety risks such as non-eye-safe lasers and high power radars, and developmental weapons systems that utilize explosive ordnance. The testing programs involve integrating proven aircraft with unproven weapons systems, and unproven aircraft with proven and unproven weapons systems. All of these tests pose a hazard to the public and non-participating aircraft. YPG has areas on the ground within the proposed SUA that are used for munitions storage, loading sites, and laboratory facilities that require appropriate explosive safety zones. Currently, there are established safety zones on the ground, but not for the airspace above these areas.

Air operations within the airspace above and around LAAF are controlled by MCAS Yuma, which are further discussed in Section 3.4, Air Transportation.

Safety for military personnel and contractors involved with mission-related activities is a priority and personnel are trained individually for the various testing and training activities through specific programs. AR 385-1 (*Safety and Occupational Health Program*) and YPGR 385-1 (*Yuma Proving Ground Safety and Occupational Health Program*) define the safety program on YPG. Aviation Safety is specifically addressed in

Department of the Army Pamphlet 385-90 (*Army Aviation Accident Prevention Program*) (Department of the Army, 2010). Contractor personnel are required to comply with the Occupational Safety and Health Act in addition to all YPG safety requirements. Range safety during testing and training events is governed by YPG SOP YP-MTRO-P-1000 (*Airspace and Range Operations*). Each individual operation or test is required to have a specific standard operating procedure, which must meet the requirements of SOP YP-MTRO-P-1000 at a minimum and may include greater safety controls. Medical evacuation pads for helicopter access are located throughout much of YPG.

Civilians are not permitted on YPG, except as military contractors, dependents, and hunters. Appropriate speed limits and traffic controls are placed throughout the installation and provide for traffic safety for all persons on YPG. Hunters are allowed in designated areas during official hunting seasons. An annual YPG range safety briefing is required before anyone can obtain a hunting permit.

Trespassers could enter restricted areas on YPG and be at risk from unexploded ordnance. In the past, campers have been found on YPG who indicated that they were unaware they were trespassing. Warning signs are posted along the boundary and roads through YPG to deter trespass.

The YPG safety program educates and protects people from injury and exposure to injurious effects. The safety program applies to all persons on YPG, including military, civilian, dependent, and contractor personnel.

3.7 Aesthetics and Visual Resources

Visual resources include natural and man-made components of the environment perceived by human receptors. Aesthetics refers to beauty in both form and appearance. Perceptions and aesthetic values may vary among individuals depending upon personal preferences.

Areas of aesthetic and visual value on YPG and the surrounding area include the Muggins Mountain Wilderness Area, Kofa NWR, Imperial NWR, Trigo Mountains Wilderness Area, including the Needles Eye pinnacle on the Trigo Mountains, Red Bluff Mountain, La Posa Dunes, Mohave Peak, the White Tanks Management Area in East Arm, and Camp Laguna. Some washes that flow into the Colorado River, including Mohave, Gould, Yuma, McAllister, and Indian washes, are also considered areas of special interest, and may provide aesthetic and visual resources to some viewers (Gutierrez-Palmenberg, Inc., and Jason Associates Corporation, 2001). Wilderness and refuge areas provide the public recreational activities such as picnicking, camping, hiking, and sight-seeing.

Due to the rugged mountains and varying topography, the public viewshed on YPG is primarily limited to the views available from US 95, Imperial Dam Road, Cibola Lake Road, and Martinez Lake Road. The southern part of the Kofa Region, which is largely unused, can be seen by persons traveling by train. Development on YPG is mainly concentrated in the cantonments, while testing and training areas typically remain open and undeveloped. Most facilities and training and testing areas on YPG are not visible from public roads.

The design and appearance of facilities on YPG are guided by the YPG Installation Design Guide. The guide promotes enhancement of the natural and man-made environments by using consistent architectural themes and standards and aims to improve functionality of the installation. Most development occurs within the valleys of YPG, and development along hillsides and in washes is generally discouraged (AECOM et al., 2011).

3.8 Recreation

YPG is closed to the public and, as noted in Section 3.4, contains restricted airspace over much of its area. Outdoor recreational and recreational aviation opportunities are limited.

Hunting is the primary recreational activity on YPG. In coordination with AZGFD, designated recreational hunting areas have been established in portions of YPG where safety constraints are not an issue and where hunting would not interfere with the military mission of the installation.

Overnight camping in conjunction with hunting is permitted, but hunters are required to obtain proper advance authorization. Since 1979, YPG has gradually increased the number of public hunting days and the available hunting acreage. While the potential for hunting on YPG is limited due to mission constraints and security concerns, YPG typically allows up to the maximum number of hunting days in accordance with state law in the designated areas (YPG, 2012).

There is no recreational fishing on YPG. Natural waters on YPG are ephemeral and do not sustain recreational fisheries. Man-made and natural storage ponds are not feasible for recreational fishing due to constraints associated with the military mission.

An area in the southern portion of the Laguna Region is authorized for use by the Boy Scouts of America (BSA) and D.A.R.E. (Drug Abuse Resistance Education) During hunting season, YPG permits BSA scouting trips to designated hunting areas (YPG HP, 2011). In 2009, YPG approved an All-Terrain Vehicle Recreational Use Area adjacent to the HCA (YPG-DPW, 2010). Horseback riding by YPG staff and their families is allowed on-post, and a stable within the WCA area is available for boarding privately owned horses. Horse owners are responsible for maintenance and upkeep of their animals. MCAS Yuma operates a recreational facility at Martinez Lake adjacent to the Colorado River that is open to local military personnel and their families (YPG, 2012). The HCA has a bowling alley, fitness center, and other Morale, Welfare, and Recreation facilities that serve the YPG community (AECOM et al., 2011).

Three USFWS NWRs are located in the vicinity of YPG. The Kofa NWR, located between the arms of YPG, encompasses approximately 665,400 acres of desert habitat. Kofa NWR offers a variety of recreational activities, including hiking, camping, sightseeing, photography, and nature observation. Regulated hunting for quail (*Callipepla gambelii*), desert bighorn sheep (*Ovis canadensis*), deer (*Odocoileus hemionus*), desert cottontail (*Sylvilagus auduboni*), coyote (*Canis latrans*), and gray fox (*Urocyon cinereoargenteus*) is permitted (USFWS, 2008).

The Cibola NWR, established in 1964, is located in the lower Colorado River floodplain. The Cibola NWR encompasses both the historic Colorado River channel and the channelized portion constructed in the late 1960s. The refuge includes a nature trail and several wildlife viewing areas. Hunting is permitted in specific areas for Canada goose (*Branta canadensis*), snow goose (*Chen caerulescens*), various duck species (family Anatidae), American coot (*Fulica americana*), gallinules (family Rallidae), Gambel's quail, mourning and white-winged doves, mule deer, and desert cottontail. The refuge also offers recreational fishing opportunities (USFWS, 2011a).

The Imperial NWR is directly south of the Cibola NWR and also within the lower Colorado River floodplain. The Imperial NWR encompasses approximately 25,768 acres and was established in 1941 as a refuge and breeding area for migratory birds and other wildlife. Similar to the other NWRs in the area, the Imperial NWR offers hiking, birding, wildlife viewing, hunting, and fishing opportunities (USFWS, 2010).

The Imperial Sand Dunes, managed by the BLM, are located in southern California approximately 15 miles west of Yuma. The dunes were formed by windblown sands from ancient Lake Cahuilla and extend for more than 40 miles. The Imperial Sand Dunes offer scenic views and opportunities for off-highway vehicle driving with appropriate permit(s) (BLM, 2011). The Picacho State Recreational Area is part of the California State Park System and provides fishing, hiking, wildlife viewing, swimming, and camping opportunities (YPG, 2012).

Environmental Consequences

This section assesses the environmental consequences associated with the Proposed Action and the No Action Alternative. Direct and indirect environmental impacts are described for each resource area identified in the previous section as potentially affected by implementation of the Proposed Action. The resource areas include air quality, noise, biological resources, air transportation, hazardous and toxic substances, health and human safety, aesthetics and visual resources, and recreation. No impacts would be anticipated for other resource areas.

4.1 Air Quality

4.1.1 Proposed Action

No direct impacts to air quality would be expected as a result of the Proposed Action. An increase in air emissions could occur from increased flights and flight testing activities at YPG and within the proposed SUA. However, the increase in use of aircraft at YPG would not be above those values presented in the 2008 EA (YPG, 2008). Impacts to air quality would be expected to remain similar to those described in the 2008 EA. Increased air pollutants resulting from increased flights would not be anticipated due to dispersal by strong winds and a lack of topographic features to inhibit dispersal (YPG, 2008). No increase in PM₁₀ would be expected as a result of the proposed SUA. Indirect impacts to air quality resulting from the Proposed Action would be considered less than significant.

4.1.2 No Action Alternative

No changes to air quality would occur under the No Action Alternative. YPG would continue to increase the number of testing and training flights of UAS as established in the 2008 EA; however, the proposed SUA would not be utilized by the UAS. UAS activities would continue to occur in other areas of YPG.

4.2 Noise

4.2.1 Proposed Action

The Proposed Action could result in increased flights within the proposed SUA, which could result in an increase in noise. These flights would mainly originate out of LAAF, which is regularly used for larger aircraft that produce high noise levels, such as the C-130, C-5, and C-17 (YPG, 2012). LAAF reported 7,864 operations from October 2010 to August 2011 (U.S. Army Public Health Command, 2011). Some of these flights currently occur within the proposed SUA. YPG calculated potential increases in noise resulting from the doubling of 2010 operations, which included noise from large caliber weapons, demolitions, and air-to-ground training. The potential expansion of noise zones from doubling air-to-ground training operations would remain within the boundary of YPG and noise impacts from air operations would not be expected outside the boundaries of YPG. It was also determined that noise zones generated from flights at LAAF would be confined to the LAAF runway and noise impacts outside of the runway would not be expected (U.S. Army Public Health Command, 2011). Based on the findings of the YPG Ground Operational Noise Management Plan, noise impacts within the proposed SUA would not be expected (U.S. Army Public Health Command, 2011).

A majority of the surface area within the proposed SUA and area surrounding LAAF is used for testing and other military activities, which would not be impacted by a potential increase in noise. The proposed SUA would be entirely confined within the boundaries of YPG. There are no private residences or public property within the proposed SUA that could be affected by a potential increase in noise. The main sensitive receptors within the proposed SUA would be the housing area in HCA. YPG has established a noise

abatement program for known sensitive areas such as housing areas and schools within the HCA. Flights under 2,000 ft AGL are not permissible over the housing and school areas within the HCA. The noise abatement program also applies to the Hidden Shores RV Park, Martinez Lake/Fisher's Landing Village/MCAS Recreation Area, the Imperial NWR, and the Kofa NWR (U.S. Army Public Health Command, 2011). With the use of the YPG noise abatement program, noise impacts would not be expected.

Personnel working at YPG are protected from potential high noise levels by following standard operating procedures and safety training. No impacts to personnel working at YPG would be expected as a result of the Proposed Action.

4.2.2 No Action Alternative

Under the No Action Alternative no changes to noise would occur.

4.3 Biological Resources

4.3.1 Proposed Action

Impacts to biological resources within the proposed restricted airspace would be mainly limited to avifauna and directly related to birds striking an aircraft during takeoff, flight, or landing. There is a fence around LAAF that would prevent other animals, such as wild horses and burros, from accessing the runway (Parsons, 2011). LAAF is a heavily used airfield and the area surrounding the airfield is largely developed. There are no bird attractants in the vicinity of LAAF, such as riparian areas associated with prominent washes, wetlands, or open water areas, where bird species might congregate. Recent evaluations have not identified migratory bird issues associated with LAAF (Parsons, 2011). In addition, impacts to biological resources would be the same as the No Action Alternative. Flights currently occur at LAAF and would continue to occur on YPG and within the proposed SUA without implementation of the Proposed Action and impacts to biological sources would not be expected to change.

Noise from aircraft overhead could indirectly impact wildlife, including Sonoran pronghorn. However, noise generated from the aircraft would be minimal due to the altitude at which the aircraft fly and would not be expected to affect wildlife behavior in a detrimental manner. In addition, flights at YPG and within the proposed SUA would occur and continue regardless of implementation of the Proposed Action. Noise generated by aircraft overhead would be similar to the No Action Alternative.

The Proposed Action would have no effects on the yellow-billed cuckoo, Yuma clapper rail, or southwestern willow flycatcher. The Proposed Action would occur in an area that lacks habitat for these species. No riparian or wetland habitat would be impacted by the Proposed Action. Additionally, military aircraft typically travel at an altitude that would limit impacts from noise near the surface. Noise generated by military aircraft is typically brief and intermittent and would not be expected to affect these species.

Impacts to biological resources from the Proposed Action would be less than significant.

4.3.2 No Action Alternative

No changes would occur under the No Action Alternative. Impacts to biological resources would be similar to that of the Proposed Action. UAS operations would continue at LAAF and within the area of the proposed SUA, with proper clearance, and throughout other airfields on YPG.

4.4 Air Transportation

4.4.1 Proposed Action

Less-than-significant impacts to air transportation would be expected as a result of the Proposed Action. The proposed SUA would provide the amount of restricted airspace necessary to allow for standard traffic patterns for aircraft to utilize the LAAF runways regardless of wind direction (YPG, 2008). The proposed

altitude range is from the surface to 1,700 AGL. UAS at YPG would likely be arriving from or departing to R-2306E, which is restricted from the surface to 80,000 feet; and R-2307, which is restricted from the surface to unlimited. These restricted airspaces abut the proposed SUA to the north and northeast, respectively. The proposed SUA would be entirely contained within the boundaries of YPG.

The proposed SUA would not affect existing flight paths for commercial or private air traffic (YPG, 2014). Existing restricted airspace north and east of the proposed SUA would preclude commercial traffic from using the airspace currently. The restricted airspace to the north is to 80,000 feet AGL, while the restricted airspace to the east is from the surface to an unlimited altitude.

Recreational private air transportation could be affected by the Proposed Action. However, any impacts would be less than significant. Impacts to recreational aviation activities are discussed in Section 3.16, Recreation.

Although the airspace reclassification would have no adverse impact on aeronautical operations within MCAS Yuma delegated airspace or to MCAS Yuma Air Traffic Control Facility operations (USMC MCAS, 2011), the proposed SUA would result in changes to MCAS Yuma aircraft operations and terminal procedures. The following changes would be anticipated:

- The proposed SUA would limit the available airspace between the YPG restricted airspace and Yuma range airspace which would increase traffic compression with users and non-users of air traffic control services. The proposed SUA would move visual flight rule traffic, regardless of altitude, to the south into a narrower corridor that would be controlled by MCAS Yuma.
- The proposed SUA would increase workload for radar approaches to runways 21R and 21L and for vectoring due to additional vertical and lateral separation requirements while vectoring aircraft for this approach and other radar approaches to the runways.
- The minimum climb rate of aircraft from MCAS Yuma towards YPG would not clear the 3-nautical-mile buffer at 1,700 ft MSL and minimum climb rate would not clear the boundary by at least 500 ft above 1,700 ft MSL. The proposed SUA would prevent slow-climbing aircraft from making turns toward the new restricted area until altitude separation is assured. In addition, aircraft departing runway 35 East bound and departing runway 8 North through Northwest bound could require vectoring to remain south of the proposed restricted area until climbing to at least 500 ft above a 3-nautical-mile buffer from the proposed restricted area boundary (USMC, 2015).

MCAS Yuma would schedule and manage the airspace within the proposed SUA upon release of the airspace by YPG. This would allow for private, commercial, and other military flights to utilize the proposed SUA with proper clearance. The proposed SUA would remain as a Class D airspace when not in use by YPG.

4.4.2 No Action Alternative

No changes to air transportation would occur under the No Action Alternative.

4.5 Hazardous and Toxic Substances

4.5.1 Proposed Action

No direct impacts to hazardous and toxic substances would be expected as a result of the Proposed Action. No change in the number of flights beyond current ranges of aircraft use and beyond values established in the 2008 UAS EA would be anticipated as a result of the Proposed Action. Impacts from increased UAS flights were expected to be less than significant. YPGs hazardous substance and waste management programs, spill prevention procedures, and training requirements would reduce or prevent the impacts from hazardous and toxic substances.

4.5.2 No Action Alternative

Impacts to hazardous and toxic substances would be similar to the Proposed Action. UAS operations would continue at levels established in the 2008 EA.

4.6 Health and Human Safety

4.6.1 Proposed Action

There would be no adverse impacts associated with health and human safety as a result of the Proposed Action. Long-term beneficial impacts would be anticipated from the Proposed Action. Currently, YPG can operate aircraft from LAAF within the proposed SUA with coordination with the FAA. The primary beneficial impacts would be associated with restricting the proposed airspace from the public, while in use.

Tests and evaluations conducted within the proposed SUA include both ground and air-to-ground laser propagation. There is the potential for unintentional and/or uncontrolled lasing of non-participating aircraft. Use of unproven integrated weapon systems, still in development, pose a hazardous risk to non-participating aircraft due to potential anomalies with radio frequency links or pre-mature weapon deployment (YPG, 2014). Restricting the airspace would eliminate hazards to the general public from the potential exposure to non-eye-safe lasers and high-power radar systems, and from interaction with experimental aircraft and weapons systems.

The Proposed Action would also reduce hazards to the general aviation public by establishing explosive quantity distances for the safe storage, handling, and integration of explosive ordnance as recommended by the Public Transportation Route Distance ground clearance criteria (YPG, 2014).

The risk of a mishap for unproven UAS with integrated weapon systems equipped with an FTS is increased during the early developmental stages. The FTS can terminate the UAS in flight if a UAS becomes unresponsive or a failure occurs. Establishing the proposed SUA would provide a controlled restricted airfield and airspace needed to test and evaluate unproven UAS systems confined and segregated from the public; and for a safe, controlled recovery of a UAS without risk to non-participating aircraft or public if one were to fail and crash. The land within the proposed SUA is entirely contained within the boundaries of YPG and there would be no risk to the public upon a UAS failure (YPG, 2014).

4.6.2 No Action Alternative

Long-term adverse impacts to health and human safety would occur under the No Action Alternative. Non-military aircraft utilizing the proposed SUA would continue to be exposed to unsafe conditions such as those mentioned under the Proposed Action.

4.7 Aesthetics and Visual Resources

4.7.1 Proposed Action

No impacts to aesthetics or visual resources would be expected as a result of the Proposed Action. The proposed restricted airspace is entirely confined within the boundaries of YPG and is unpopulated except for the housing area within the HCA. UAS flights would be limited to an elevation of 1,700 feet AGL and are generally smaller than manned aircrafts. In addition, LAAF is regularly used for other flight activities consisting of larger manned aircraft. Due to the mountainous terrain and lack of population or development, it would be unlikely for the public to perceive a change in use of aircraft within the proposed SUA.

4.7.2 No Action Alternative

There would be no changes to aesthetics and visual resources as a result of the No Action Alternative.

4.8 Recreation

4.8.1 Proposed Action

There would be no impacts to ground-based recreational activities at YPG as a result of the Proposed Action. There could be negligible impacts to the general public who participate in aviation as a recreation. The proposed SUA would prohibit use of the airspace by the public from ground level to 1,700 AGL, while in use by YPG. However, impacts would be minimal as there are other areas nearby available for recreational aviation activities. When the proposed SUA is not in use by YPG, the airspace can be used by the general aviation public with proper clearance. MCAS Yuma schedules airspace in the greater Yuma region and would manage the proposed restricted airspace when not in use by YPG.

4.8.2 No Action Alternative

There would be no change to recreation as a result of the No Action Alternative.

4.9 Cumulative Impacts

Cumulative impacts result from incremental impacts of an action when combined with other past, present, and reasonably foreseeable actions (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions over a period of time (CEQ, 1997). Cumulative impacts would occur if incremental impacts of the Proposed Action, added to the environmental impacts of past, present, and reasonably foreseeable similar actions, would result in an adverse effect to resources in the region.

Less-than-significant adverse cumulative impacts would be expected as a result of the Proposed Action. An increase in UAS operations at YPG was determined to have less-than-significant cumulative impacts (YPG, 2008). An increase in use of LAAF for aircraft operations, including UAS operations, would not be expected to conflict with or increase impacts from past, ongoing, and reasonably foreseeable actions. However, the proposed SUA would result in changes in MCAS Yuma controlled airspace by limiting the available airspace between the YPG restricted airspace and nearby restricted (i.e., MCAS Yuma restricted airspace). This could compress traffic with users and non-users of air traffic control services and result in additional vertical and lateral separation requirements. YPG would continue to coordinate with MCAS Yuma and other users to ensure that the airspace would remain productive for all users.

2 **Conclusions**

3 This Supplemental EA has analyzed the potential for environmental impacts to each applicable resource area
4 and has determined that no significant adverse impacts would be expected as a result of implementation of
5 the Proposed Action. The proposed SUA would not conflict with commercial or private air traffic patterns,
6 but would have less-than-significant effects on air traffic operations at MCAS Yuma. Long-term beneficial
7 impacts to health and human safety would be expected as a result of the Proposed Action. Hazards to the
8 public from ongoing and future training and testing activities at YPG within the proposed SUA would be
9 reduced and/or eliminated from YPG-operated aircraft, as well as from potential explosive arcs from
10 storage, handling, testing, and training activities on the ground. YPG would also be able to meet current and
11 future mission needs by providing the needed airspace to allow for testing, training, and evaluation of
12 aircraft at LAAF.

13

SECTION 6

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SECTION 7

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