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ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED UPDATE AND IMPLEMENTATION OF THE NATIONAL GUARD BUREAU TRAINING PLAN 60-1 IN SUPPORT OF OPERATION SNOWBIRD DAVIS-MONTHAN AIR FORCE BASE, ARIZONA

July 2012

DRAFT
FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF PROPOSED ACTION

Update and Implementation of the National Guard Bureau Training Plan 60-1 in Support of Operation Snowbird, Davis-Monthan Air Force Base, Arizona

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Air Force proposes to update and implement the National Guard Bureau (NGB), Air National Guard's (ANG) Training Plan (TP) 60-1 and an addendum to of the TP 60-1, (Annex C) the Ramp Management Plan (RMP), at Davis-Monthan Air Force Base (DMAFB), Arizona. The implementation of TP 60-1 would support Operation Snowbird (OSB), which is a year-round training mission designed to build and maintain the readiness of active, reserve, and guard units composing the Total Force of the Department of Defense, so that they are capable of supporting extended combat and other national security operations worldwide. Such capabilities require training with joint coalition air operations and multi-service activities to ensure greater interoperability. The Proposed Action would increase the annual number of sorties at DMAFB from the 1,190 sorties flown in Fiscal Year (FY) 2009 (i.e., the baseline) to 2,256.

Four alternatives, including the No Action Alternative, were analyzed in detail in the environmental assessment (EA). Under any of the three action alternatives, OSB training activities would occur at various levels of intensity and with different types of aircraft. The same airspace would be used under each action alternative; types of munitions used would also be similar. These training activities would fit within the capacity of existing airspace and ranges as previously assessed for environmental impacts. No construction would be required to update and implement TP 60-1.

The Preferred Alternative (Proposed Action) is for the NGB to update and implement the TP 60-1 and Annex C at DMAFB. This action would increase the annual number of sorties from the (FY) 2009 level of 1,190 to 2,256. The 2,256 sorties include the sorties required to deploy and redeploy the units, as well as cargo support. This number of sorties represents approximately 7 percent of the total DMAFB annual sorties. Typically, up to 12 training events would be conducted each year. Units would typically deploy for approximately 2 weeks (training event) and include a maximum of 24 officers, 116 enlisted personnel, and 12 aircraft. The primary aircraft expected to participate would be F-16 and A-10; however, additional U.S. aircraft that would be expected to participate include, but are not limited to, F-15, F-18 E/F, F-22, MC-12, C-127, AV-8, and MV-22. International aircraft expected to participate would include EF-2000 Typhoon, GR-4 Tornado, F-21 Kfir, Mirage 2000, and Rafale. Additional helicopters anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725.

Alternative 2 would allow OSB training missions to continue at DMAFB at the same level that occurred in 2002, when approximately 1,979 sorties were conducted. Under this alternative, however, only U.S. units or coalition partners that fly U.S. aircraft would participate in the OSB training. Alternative 2 would result in 12 percent fewer total OSB sorties, as compared to the Proposed Action discussed above, and would exclude

numerous coalition partners that use GR-4, Mirage 2000, and other foreign-made aircraft.

Alternative 3 would include OSB training sorties at the same level as Alternative 2 (i.e., 1,979 per year), but would include additional international aircraft such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale.

The No Action Alternative, which is considered the baseline, would allow the OSB training activities to continue at the levels and intensity completed in FY 2009. Under this alternative, up to 1,190 sorties would be flown annually. U.S. and foreign-ally aircraft would participate in the training events, as described for the Proposed Action.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The EA provides an analysis of potential environmental impacts of the Proposed Action and alternatives within the region of influence, which includes DMAFB and Pima County. Four resource areas were evaluated during the preparation of the EA. No impacts were identified on land use, climate, geology, soils, water quality and supply, wetlands, fish and wildlife populations, cultural resources, transportation, and public services. Insignificant impacts would be incurred on noise, air quality, socioeconomics, and public health and safety, as identified below. The No Action Alternative would result in no change to existing conditions.

Noise: A slight expansion to the 65-decibel (dB) and 70 dB Day/Night Level (DNL) noise contours would occur for each of the three action alternatives compared to the No Action Alternative. The increase would occur in areas southeast and northwest of DMAFB; no residences or other noise-sensitive receptors would be affected in the areas southeast of DMAFB. However, in areas northwest of DMAFB, 17 additional residences would be located within the 65-69 dB DNL contour, and three additional residences would be located within the 70-74 dB DNL contour. These expansions in the noise contours would be imperceptible to the residents, as the changes in contours would be less than 50 feet.

Air Quality: There would be no significant impacts on the region's air quality under any alternative. Under the Proposed Action, annual air emissions from OSB aircraft would be estimated to be up to 41.00 tons of carbon monoxide and up to 0.20 ton of particulate matter less than 10 microns, which are the two pollutants of concern in Pima County. All emissions would be well below *de minimis* thresholds of 100 tons per year. Therefore, a Conformity Analysis would not be required.

Socioeconomics: No long-term adverse effects on the region's socioeconomic conditions would be expected. Some short-term benefits would occur during each training event due to increased expenditures for auto fuel, rental cars, hotels, and meals. Property values near DMAFB have not experienced decreases as dramatic as those of other properties in the outlying portions of the City of Tucson or Pima County, suggesting that existing aircraft operations have not decreased property values compared to other properties in the local area. Consequently, property values would not be expected to be adversely affected by OSB operations as proposed. The slight change in noise contours would not be expected to significantly impact property values. Since no displacement or relocation of houses or community facilities (e.g., churches, schools, parks) would occur, no adverse effects on community cohesion would be

expected. There would be no additional disproportionately high and adverse impacts on minority and low-income populations near DMAFB compared to those impacts associated with No Action Alternative.

Public Safety: Public safety risks would not be measurably increased under any of the alternatives. The risk factors for F-16 and A-10 aircraft, which compose over 60 percent of the aircraft participating in OSB, are extremely low. OSB has operated for over 35 years without a single major mishap, and this safety record is expected to continue. Compliance with DMAFB Instruction 11-250 "Flying Operations," as well as other standard operating procedures established by the ANG for OSB, would further enhance the safety of OSB training events.

4.0 CONCLUSION

Based on the analysis of the EA conducted in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and Air Force Instruction (AFI) 32-7061, which is hereby incorporated by reference, and after careful review of the potential impacts, I conclude that updating and implementing TP 60-1 at Davis-Monthan AFB, which is the Preferred Alternative, would not result in significant impacts on the quality of the human or natural environment. Therefore, a Finding of No Significant Impact (FONSI) is warranted, and an Environmental Impact Statement is not required for this action.

_____ _____

GARY D. CHESLEY, Colonel, USAF Date
Deputy Director, Installations & Mission Support

Cover Sheet
Environmental Assessment for the Update and Implementation of the National Guard Bureau Training Plan 60-1 in Support of Operation Snowbird
Davis-Monthan Air Force Base, Arizona

a. ***Responsible Agency:*** United States Air Force (Air Force)

b. ***Proposals and Actions:*** The Air Force proposes to update and implement the National Guard Bureau (NGB), Air National Guard's (ANG), Training Plan (TP) 60-1 and an addendum to (Annex C) of the TP 60-1, the Ramp Management Plan (RMP), at Davis-Monthan Air Force Base (DMAFB), Arizona. The implementation of TP 60-1 would support Operation Snowbird (OSB), which is a year-round training mission designed to build and maintain the readiness of active, reserve, and guard units composing the Total Force of the Department of Defense (DoD), so that they are capable of supporting extended combat and other national security operations, including joint coalition air operations and multi-service activities, all of which increasingly require greater interoperability. OSB is a program that is managed by ANG's 162nd Fighter Wing (162 FW), Detachment 1 (Det 1) and is managed separately from the 162 FW activities that are operated out of the Tucson International Airport (TIA). The Proposed Action would increase the annual number of sorties from the 1,190 sorties flown in 2009 (i.e., the baseline) to 2,256; this level of activity represents approximately 7 percent of the total sorties flown at DMAFB. Two other alternatives are also evaluated using the 2002 number of sorties (1,979) and combination of different U.S. and foreign aircraft. Up to 12 training events would typically occur annually, with each training event lasting for 2 weeks. No military construction or expansion of military training airspace is proposed.

c. ***For Additional Information:*** Telephone inquiries may be made to ACC Public Affairs at 757-764-5994 or locally from the DMAFB, 355th Fighter Wing (FW), Public Affairs Office (PAO), by calling (520) 228-3398. Comments must be submitted in writing and mailed to ATTN: OSB EA COMMENT SUBMITTAL, 355th Fighter Wing Public Affairs, 3180 S. First Street, Davis-Monthan AFB, Arizona 85707.

d. ***Designation:*** Draft Environmental Assessment (DEA)

e. ***Abstract:*** This EA has been prepared in accordance with the National Environmental Policy Act. The EA team focused the analysis on the following resources: noise, public safety and risks, air quality, socioeconomics, property values, and environmental justice. Increases in the number of sorties would occur under the Proposed Action over the baseline year (2009), but would be similar to historic numbers of sorties in the past decade. Additional off-base land area would be subjected to Day/Night Average Sound Levels (DNL) greater than 65 decibels (dB) southeast and northwest of DMAFB; approximately 17 residences would be affected by an increase in the 65 dB DNL and three residences by an increase in the 70 dB DNL. Air emissions from the additional sorties would be below *de minimis* thresholds. No measurable increase in public risks would occur; OSB has operated for the past 35+ years with no Class A mishap rates and this safety record would be expected to be maintained. No long-term personnel and population increases are anticipated from the proposed update and implementation of TP 60-1; short-term and sporadic increases in regional income, sales volumes, and sales taxes would occur during each 2-week training event. There would be no additional disproportionately high and adverse impacts on minority and low-income populations near DMAFB compared to those impacts associated with No Action Alternative.

EXECUTIVE SUMMARY
ENVIRONMENTAL ASSESSMENT
FOR THE UPDATE AND IMPLEMENTATION OF THE NATIONAL GUARD BUREAU TRAINING PLAN 60-1 IN SUPPORT OF OPERATION SNOWBIRD DAVIS-MONTHAN AIR FORCE BASE, ARIZONA

Introduction: In accordance with the National Environmental Policy Act of 1969 (NEPA), the U.S. Air Force (Air Force), Air Combat Command (ACC), and the U.S. Army Corps of Engineers, Sacramento District have prepared this Environmental Assessment (EA) for the proposed update and implementation of the Annex C Addendum (Snowbird Ramp Management Plan) of the National Guard Bureau (NGB), Air National Guard's (ANG) Training Plan (TP) 60-1 and Annex C to TP 60-1, the Ramp Management Plan (RMP), at Davis-Monthan Air Force Base (DMAFB), Arizona. This EA discusses the potential environmental effects of the proposed continuation and increase of Operation Snowbird (OSB), which is a year-round training mission designed to build and maintain the readiness of active, reserve, and guard units, as well as foreign ally units.

Background/Setting: NGB is preparing to update its TP 60-1, including the RMP, which would address the NGB's proposed management of OSB at DMAFB. OSB is a program that is managed by ANG's 162nd Fighter Wing (162 FW), Detachment 1 (Det 1) based at DMAFB. The training plan would establish formal procedures, management controls, and coordination requirements for operations supported by 162 FW Det 1. OSB has been in existence since 1975 and was designed and implemented to allow ANG units from bases located in northern latitudes (or "northern tier") to train in optimal weather conditions and vast airspace over southern Arizona, primarily during the winter months. OSB now provides year-round training for U.S. and foreign units to ensure interoperability during overseas deployments. NGB's proposed update to TP 60-1 identifies the number and types of aircraft, as well as operational requirements, anticipated under OSB at DMAFB.

Proposed Action: Under the Proposed Action, the NGB would update and implement TP 60-1 and Annex C at DMAFB. This action would increase the annual number of sorties from the 2009 level of 1,190 to 2,256. The 2,256 sorties include the sorties required to deploy and redeploy the units as well as cargo support. This number of sorties represents approximately 7 percent of the total number of sorties flown out of DMAFB. Typically, up to 12 training events would be conducted each year. Units would typically deploy for approximately 2 weeks (training

event) and include a maximum of 24 officers, 116 enlisted personnel, and 12 aircraft. The primary aircraft expected to participate would be F-16 and A-10; however, additional U.S. aircraft that would be expected to participate include, but are not limited to, F-15, F-18 E/F, F-22, MC-12, C-127, AV-8, and MV-22. International aircraft expected to participate would include EF-2000 Typhoon, GR-4 Tornado, F-21 Kfir, Mirage 2000, and Rafale. Additional helicopters anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725. In the event other types of aircraft are proposed to be used in these training measures, additional or supplemental NEPA documentation might be required.

OSB operations would comply with DMAFB Instruction 11-250 “Flying Operations”; however, some OSB flying activities would occur between the hours of 2200 and 0700 (i.e., nighttime) to provide realistic training, such as the use of night vision goggles. It is anticipated that less than 2 percent of the sorties would occur during these hours. Once the training mission within the assigned airspace is accomplished, aircraft will return to DMAFB for a full-stop landing (i.e., no touch and go’s). All OSB aircraft that are below 10,000 feet above ground level (AGL) and within 30 nautical miles of DMAFB would be restricted to a maximum airspeed of 350 knots on departure or 300 knots on recovery (i.e., approaching DMAFB for landing) to keep the aircraft as high as possible and for as long as practicable. To further abate noise, departures would use Runway 12 and arrivals would use Runway 30 to the extent practicable, particularly during the few nighttime operations. This action would concentrate the majority of the air traffic noise southeast of DMAFB and away from the majority of the population near downtown Tucson.

Whenever OSB aircraft depart DMAFB with live weapons on board, the departure would be required to be on Runway 12; OSB aircraft with unexpended live ordnance would recover only to Runway 30. OSB aircraft with hung or unsafe live ordnance would not return to DMAFB; instead, they would be diverted to an alternate recovery location.

Alternative 2. Continuation of OSB at 2002 Levels:

Under Alternative 2, OSB training missions would continue at DMAFB at the same level and with the aircraft identified in the 2002 Combat Search and Rescue (CSAR EA). Approximately 1,979 sorties would be conducted annually including mobilization/demobilization and cargo support sorties; only U.S. units or coalition partners that fly U.S. aircraft would participate under this alternative. Alternative 2 would result in 12 percent less OSB sorties, as compared to the

Proposed Action discussed above, and would exclude numerous coalition partners that use GR-4, Mirage 2000, and other foreign-made aircraft.

Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level: This alternative would involve the same level of sorties (1,979) and aircraft described for Alternative 2 but would include additional international aircraft such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale. Other similar international aircraft could be used, depending upon requests received from foreign nations and approval by the Secretary of the Air Force.

No Action Alternative: The No Action Alternative would allow the OSB training activities to continue at the levels and intensity completed in 2009. Under this alternative, up to 1,190 sorties would be flown annually. U.S. and foreign-ally aircraft would participate in the training events.

Other Alternatives: Alternatives to relocate OSB to other installations were posed by several comments during the scoping process, including the Gila Bend Auxiliary Air Field, Libby Army Air Field, Luke AFB, and TIA. In order to expand the infrastructure at Gila Bend Auxiliary Field or Libby Army Airfield, dramatic capital improvements at those facilities would be required to safely launch and recover aircraft on a permanent basis. Given the time required to plan, design, and construct these expansions, an unacceptable break or delay in combat aircrew training would result for the ANG and their training partners. The time required to plan, design, and construct these expansions would cause an unacceptable break or delay in combat aircrew training for the ANG and their training partners. Consequently, this alternative was eliminated from further consideration.

Environmental Consequences: There would be no significant impacts on the region's air quality under any alternative. All emissions would be well below *de minimis* thresholds. A slight expansion to the 65-decibel (dB) and 70 dB Day/Night Level (DNL) noise contours would occur for each of the three action alternatives compared to the No Action Alternative. The increase would occur in areas southeast and northwest of DMAFB; no residences or other noise-sensitive receptors would be affected in the areas southeast of DMAFB. However, in areas northwest of DMAFB, 17 residences would be affected by the increase in the 65-dB DNL and three residences would be affected by an increase in the 70-dB DNL. These expansions in the noise contours would be imperceptible to the residents as the changes in contours would be

less than 50 feet. Public safety risks would not be measurably increased under any of the alternatives. The risk factors for F-16 and A-10 aircraft, which compose over 60 percent of the aircraft participating in OSB, are extremely low. OSB has operated for over 35 years without a single major mishap and this safety record is expected to continue. Compliance with DMAFB Instruction 11-250 "Flying Operations", as well as other standard operating procedures established by the 162 FW Det 1 for OSB, would further enhance the safety of OSB training events. These training activities would fit within the capacity of existing airspace and ranges as previously assessed for environmental impacts

No long-term adverse effects on the region's socioeconomic conditions would be expected. Some short-term benefits would occur during each training event due to increased expenditures for auto fuel, rental cars, hotels, and meals. Property values near DMAFB have not experienced decreases as dramatic as those of other properties in the outlying portions of the City of Tucson or Pima County, suggesting that existing aircraft operations have not decreased property values compared to other properties in the local area. Consequently, property values would not be expected to be adversely affected by OSB operations as proposed. The slight change in noise contours would not be expected to significantly impact property values. Since no displacement or relocation of houses or community facilities (e.g., churches, schools, parks) would occur, no adverse effects on community cohesion would be expected. There would be no additional disproportionately high and adverse impacts on minority and low-income populations near DMAFB compared to those impacts associated with No Action Alternative. A summary of the alternatives and their anticipated effects is presented below in Table ES-1.

Table ES-1. Summary of Impacts Associated with Each Alternative

Alternative	# Sorties	Foreign Aircraft	Impacts				
			Noise	Air Quality	Property Values	Environmental Justice	Safety
No Action	1190	Yes	⊘	⊙	⊘	⊙	⊙
Alternative 1	2256	Yes	⊙	⊙	⊘	⊙	⊙
Alternative 2	1929	No	⊙	⊙	⊘	⊙	⊙
Alternative 3	1979	Yes	⊙	⊙	⊘	⊙	⊙

⊘ = no or negligible effect ⊙ = minor effect ○ = moderate effect ● = major effect

Conclusion: The data presented in the EA documents that the proposed update and implementation of the Annex C Addendum (Snowbird Ramp Management Plan) of the TP 60-1

at DMAFB would result in insignificant adverse impacts on the area's human and natural environment. Therefore, no additional environmental analysis (i.e., Environmental Impact Statement) is warranted.

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SECTION 1.0
INTRODUCTION AND BACKGROUND

Environmental Assessment for the Update and Implementation of the National Guard Bureau Training Plan 60-1 in Support of Operation Snowbird Davis-Monthan Air Force Base, Arizona

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This environmental assessment (EA) evaluates the potential environmental impacts of the proposed update and implementation of the Annex C Addendum (Snowbird Ramp Management Plan) of the National Guard Bureau's (NGB), Air National Guard (ANG) recently updated Training Plan (TP) 60-1, the Ramp Management Plan (RMP), at Davis-Monthan Air Force Base (DMAFB), Arizona (Figure 1-1). DMAFB is one of the U.S. Air Force's Air Combat Command (ACC) bases. This EA has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA); Council on Environmental Quality (CEQ) regulations; and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, as promulgated at 32 Code of Federal Regulations (CFR) Part 989.

1.2 Background

NGB is preparing to update its TP 60-1, including the RMP (Annex C), which would address the NGB's proposed management of Operation Snowbird (OSB) at DMAFB. OSB is a program that is managed by ANG's 162nd Fighter Wing (162 FW), Detachment 1 (Det 1) based at DMAFB. The training plan would establish formal procedures, management controls, and coordination requirements for operations supported by 162 FW Det 1. Separate from OSB, routine ANG activities are conducted by the 162 FW out of the Tucson International Airport (TIA), which is located approximately 3.75 miles southwest of DMAFB.

OSB has been in existence since 1975 and was designed and implemented to allow ANG units from bases located in northern latitudes (or "northern tier") to train in optimal weather conditions and vast airspace over southern Arizona, primarily during the winter months. The 355th Tactical Fighter Wing, the predecessor to the 355th Fighter Wing (355 FW), completed an EA, and a Finding of No Significant Impact (FONSI) was issued in 1978 to address the new activities occurring under OSB at DMAFB (DMAFB 1978). A fatal crash of an A-7 operated by a 355th Tactical Fighter Wing pilot in 1978 prompted the Air Force and ANG to reevaluate the OSB program. A portion of the OSB was relocated to other bases, which reduced the number of OSB aircraft at DMAFB by 30 percent. In addition, by substituting two A-10 units for A-7 units, it

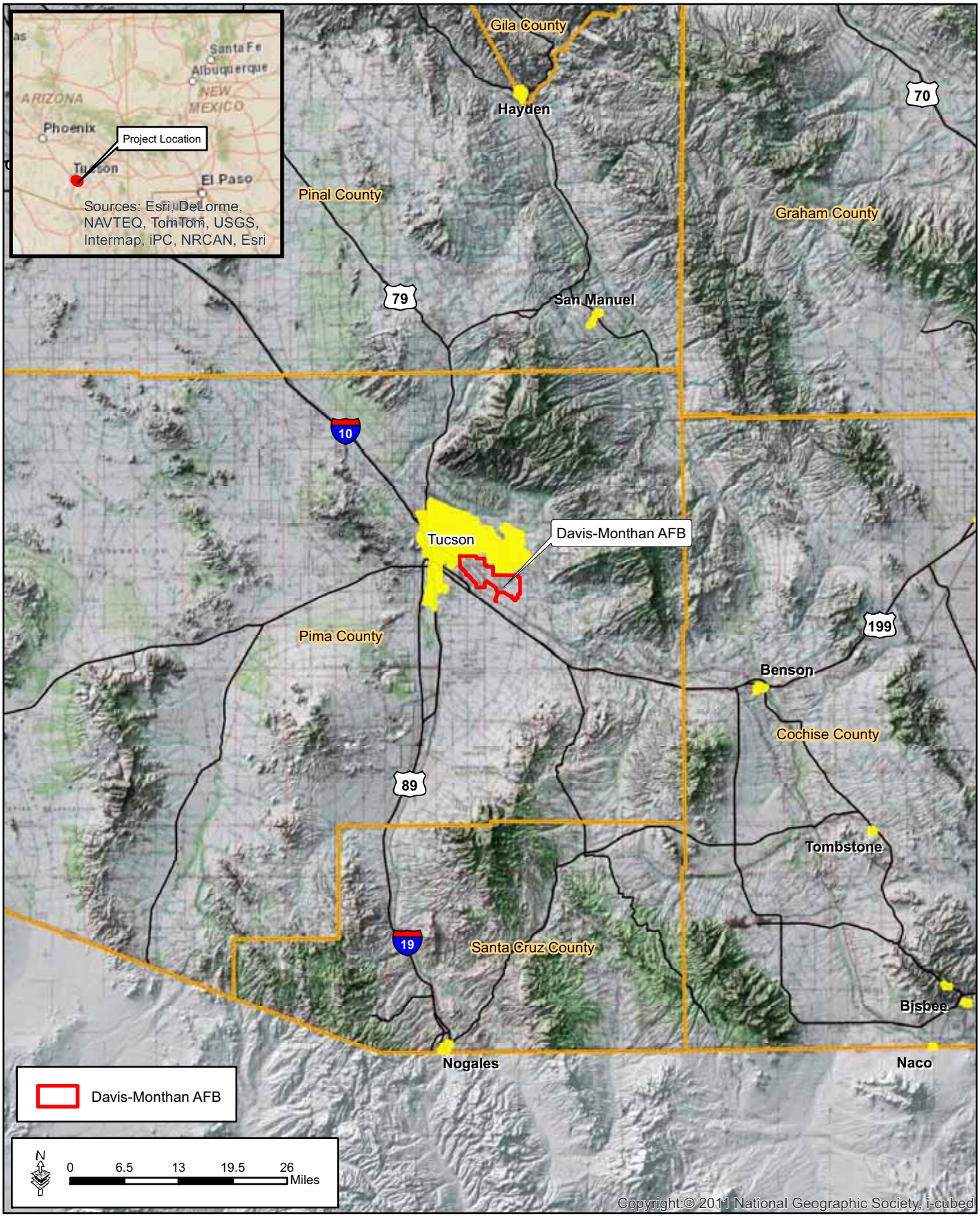

Figure 1-1: Vicinity Map

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reduced the number of participating A-7 units from five to three (Air Force 1979). Between 1988 and 1992, the type of aircraft flying in OSB converted from F-100 and A-7 to F-16.

NGB also prepared two additional EAs in 1995 and 1999, both of which primarily addressed the proposed construction of facilities at DMAFB in support of OSB. The 1995 EA and associated Air Force memoranda indicated that the number of National Guard units participating in OSB training events at DMAFB ranged from 13 to 15 annually and that the OSB was no longer considered a "wintertime" only mission. Another NEPA document since that time that included analysis of OSB activities was the *Final Environmental Assessment for the West Coast Combat Search and Rescue (CSAR) Beddown,* which was prepared by ACC in 2002 (hereinafter referred to as the 2002 CSAR EA).

NGB's proposed update to TP 60-1 identifies the number and types of aircraft, as well as operational requirements, anticipated under OSB at DMAFB. Numerous training airspaces, including restricted areas (RA), military operations areas (MOA), military training routes (MTR), and Air Traffic Control Assigned Airspace (ATCAA), are used throughout southern Arizona. The training activities proposed would be within capacity of existing airspace and ranges, which have been previously assessed for environmental impacts. The MOAs typically used by DMAFB are shown in Figure 1-2. The Morenci, Ruby, Fuzzy, Outlaw, Reserve, and Jackal MOAs and the VR-263 MTR are managed by the 162 FW. The 355 FW manages the Tombstone MOA. The 56th Fighter Wing out of Luke Air Force Base (AFB) manages the Sells MOA, Restricted Airspace R-2305 and other airspace over the Barry M. Goldwater Range (BMGR). U.S. Army Fort Huachuca manages the Mustang MOA. Air-to-ground target ranges located on BMGR, which is managed by Luke AFB, are used for live and inert ordnance delivery training (Figure 1-3). Airspace over the Cabeza Prieta National Wildlife Refuge (CPNWR) is also considered part of the BMGR; however, no targets are located on the CPNWR.

The BMGR contains a vast array of targets capable of receiving live and inert ordnance, including premier electronic targeting systems at the North Tactical Range (NTAC), South Tactical Range (STAC), and East Tactical Range (ETAC). Such capabilities are not readily available to most other NGB units and foreign national units at other national ranges. In addition to these premier target ranges at BMGR and the numerous airspace units, DMAFB provides numerous other assets that are integral to the efficiency and effectiveness of OSB activities. These assets include the following:

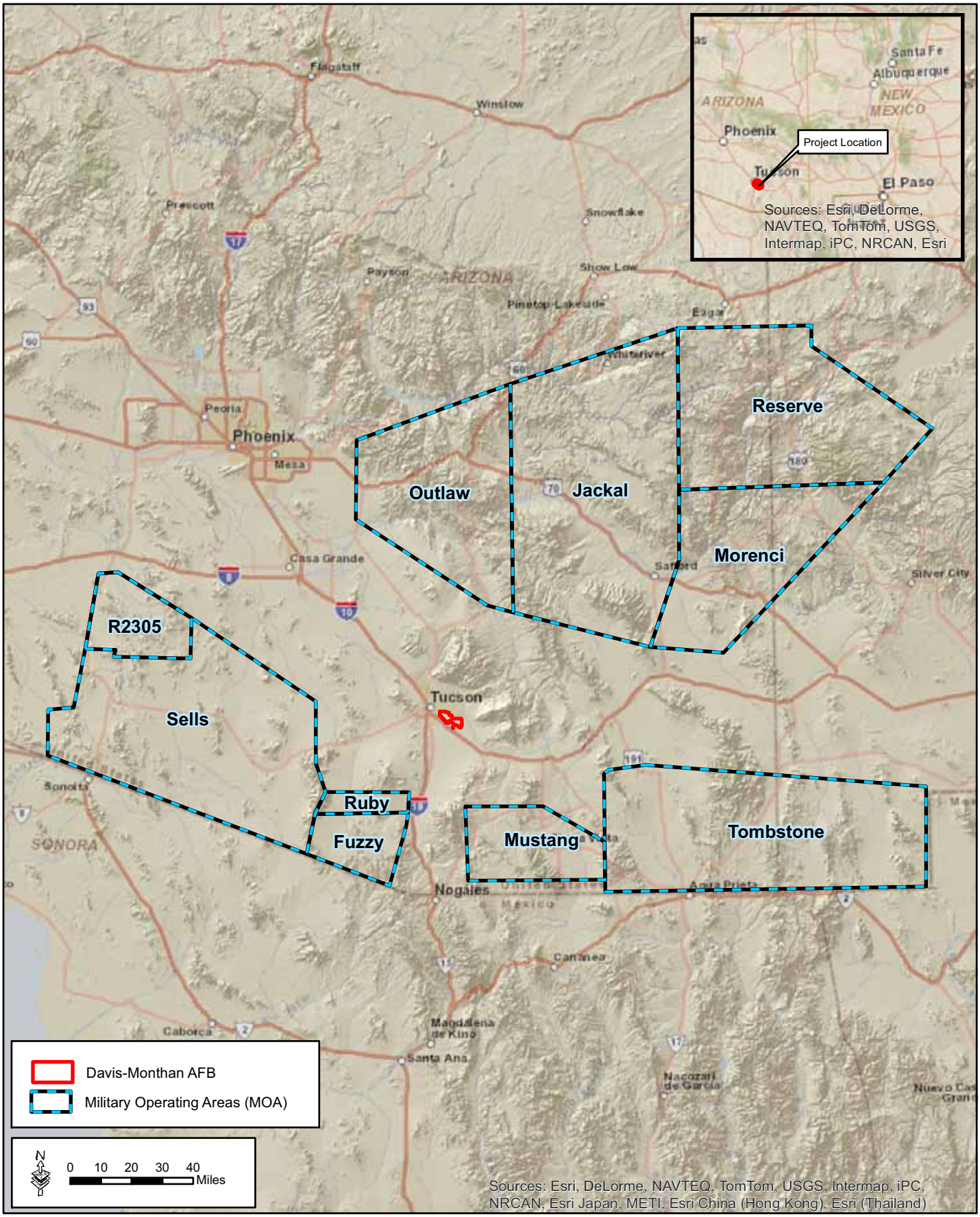

Figure 1-2: Training Airspace in the Vicinity of Davis-Monthan AFB

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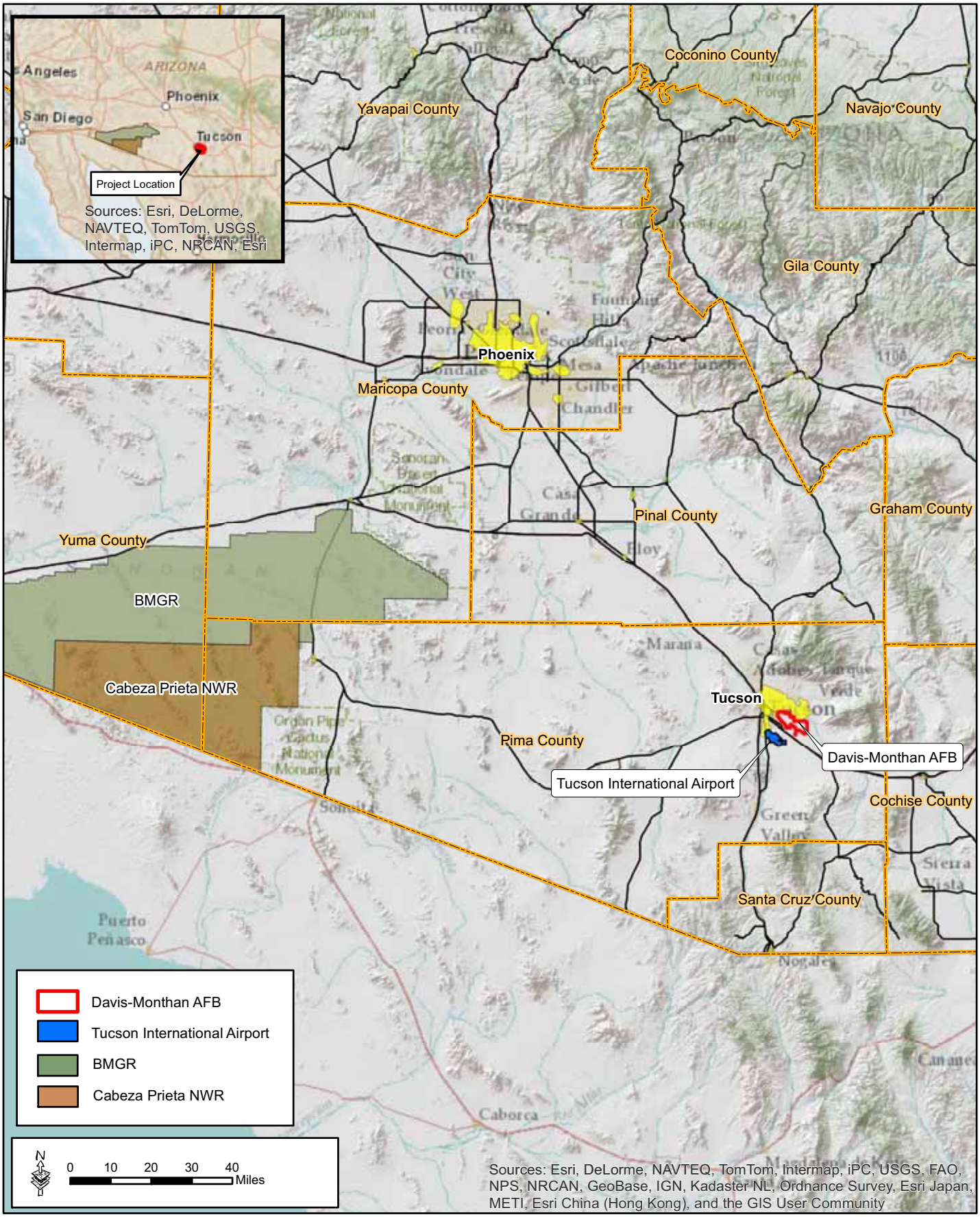

Figure 1-3: Davis-Monthan AFB, Tucson International Airport and BMGR

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Facilities and Administration

- 13,643-foot runway (one of the longest in the nation)
- Live Ordnance Loading Area (LOLA) capable of handling up to 5,000-pound munitions
- Live munitions storage and build-up facilities
- Bulk Fuel Storage and Loading Area
- On-base medical, lodging, and dining facilities
- On-base master mechanics/maintenance for the A-10 and F-16 aircraft maintenance (beyond that which units would normally deploy with)
- Proximity to 162 FW at TIA

Infrastructure Assets

- Secure communications
- Data link infrastructure (i.e., LINK-16 and SADL) to support flying operations
- Dedicated aerospace ground equipment (AGE)
- Access to existing engine analysis laboratory
- Existing, dedicated ramp space to support 38 visiting fighter aircraft

Safety and Operational Assets

- Crash/Fire/Rescue response unit
- Immediate access to hydrazine storage and emergency response for F-16 aircraft
- Existing Anti-Terrorism/Force Protection systems
- Close proximity to available military airspace
- Close proximity to enhanced electronic tactical ranges

1.3 Purpose and Need

The purpose for the Proposed Action is to identify the required training to be conducted to build and maintain the readiness of active, reserve, and guard units composing the Total Force of the Department of Defense (DoD) so they are capable of supporting extended combat and other national security operations, including joint coalition air operations and multi-service activities, all of which increasingly require greater interoperability. The need is to provide training opportunities to the Total Force, as well as to foreign national units; such training would not only

be valuable to our allies, but would also provide realistic training for U.S. units for times when they have to deploy overseas and conduct missions with foreign national units. The ANG and foreign allies of the Air Force have an immediate, real-time need to provide trained air crews to support the ongoing combat operations in Afghanistan, Iraq, Africa, and other global locations where American and allied forces go in harm's way. The Air National Guard currently represents 21 percent of the uniformed members of the Total Air Force. Congressionally proposed reductions in Air Force, ANG, and Air Force Reserve manpower have effectively increased the demand for fully trained aircrews within all operational theaters. Delays in providing these trained aircrews would be unacceptable to combat commanders relying on trained aircrews to execute their ongoing day-to-day missions because they represent unacceptable risk to the lives of other American and allied forces who depend on their support.

1.4 Public Involvement

The Air Force invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. The Air Force set forth the Interagency/Intergovernmental Coordination for Environmental Planning (IICEP) as a scoping process that informs local, state, tribal, and Federal agencies of proposed projects. 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.

Public participation opportunities with respect to the EA and decision making on the Proposed Action are guided by 32 CFR Part 989. Scoping meetings were conducted at three different locations near DMAFB to inform the public about the purpose and need for the action alternatives that are being considered, as well as the NEPA process. Input from the public was solicited regarding the alternatives, as well as potential impacts and mitigation for those impacts. A total of 145 persons attended the three meetings. Comments on the proposed action and alternatives were accepted at the meetings and via e-mail, fax, and U.S. Postal Service until 15 November 2011. A total of 517 comments were received, including 76 that suggested that different alternatives should be evaluated. Many of the comments were related to using a different baseline than what was presented at the public scoping meetings, as well as noise and safety effects from overflights. Table 1-1 provides a breakdown of the comments received, excluding those that either supported or objected to the program. The sections of the

EA in which each of these issues is addressed is identified in this table as well. No scoping comments were received from Federal agencies. Of particular importance is the fact that the baseline or No Action Alternative that was presented at the scoping meetings has since changed, largely in part because of the number and content of the comments received during the scoping process. The baseline presented at the scoping meeting was to use the 2002 CSAR EA, which had tangentially analyzed OSB sorties. Subsequently, the Air Force determined that the number of OSB sorties in 2009 more accurately reflect the baseline conditions, as will be discussed later.

Table 1-1. Summary of Scoping Comments Received

Comment Issue	Number of Comments			EA Section(s) Where Addressed
	Private	NGO	% of Total Comments Received	
Alternative				
Use a different installation	44	3	9%	2.5
Reroute planes and flight altitude	11		2%	2.2.2
Use a baseline other than 2002	4		1%	1.4; 2.1; 2.3
Expand the program/ expand the EA	5		1%	2.2
Use different hours, fly on weekends	3		1%	2.2.2
No alternatives are acceptable	5	1	1%	NA
Total	**72**	**4**		
Analysis/Evaluation				
Use a different baseline for analysis	47	4	10%	1.4; 2.1; 2.3
Avoid use of noise averaging/models	36	2	7%	4.1
Critical review of environment/wildlife	13	1	3%	NA
Critical review of property values	40	3	8%	3.3.2; 4.3.2
Health issues relative to noise and stress	47	2	9%	3.1; 4.1
Flights within City of Tucson/safety/crash	55	4	11%	2.2.2; 3.4; 4.4
Added pollution/air quality	22	1	4%	3.2; 4.2
Noise problem/quality of life	68	3	14%	3.1; 3.3.3; 4.1; 4.3.3; 5.2.1
Safety/noise issues of foreign and domestic pilots/aircraft (substandard)	21		4%	3.1; 3.4; 4.1; 4.4
Economic risk, reduce tourism, pro, cons	23	3	5%	4.3.12
Impact of low-income/minority groups, environmental justice	14	1	3%	3.3.4; 4.3.4; 5.3.2
Update DMAFB Joint Land Use Study and Air-Installation Compatible Use Zone (AICUZ)	3	1	1%	NA
Count jet arrivals as well as departures and sorties/touch and go's	4	1	1%	2.2.2
DMAFB "mission creep" since 1978	13	1	3%	1.2; 2.1
City/Base encroachment	6	2	2%	NA
Total	**412**	**29**	**100%**	

NA = Not Applicable or beyond the scope of the EA

Copies of the public notices, distribution list, and information provided at the scoping meeting are contained in Appendix A. Upon completion, the draft EA will be made available to the public for review and comment for 45 days beginning the day the Notice of Availability (NOA) is published in local newspapers. At the end of the 45-day public review period, the Air Force will consider any comments that are submitted by individuals, agencies, or organizations regarding the Proposed Action and the EA. If the Air Force determines that the Proposed Action would not result in any significant impact on the human environment, the Air Force may proceed with the Proposed Action. If it is determined that implementation of the Proposed Action would result in significant impacts, the Air Force would commit to mitigation actions sufficient to reduce impacts to less than significant levels, publish in the *Federal Register* a notice of intent to prepare an environmental impact statement, or not implement the Proposed Action.

Throughout this process, the public may obtain information on the status and progress of the Proposed Action and the EA through the 355th Fighter Wing (FW), Public Affairs Office (PAO), by calling (520) 228-3398. Comments must be submitted in writing and mailed to ATTN: OSB EA COMMENT SUBMITTAL, 355th Fighter Wing Public Affairs, 3180 S. First Street, Davis-Monthan AFB, Arizona 85707.

SECTION 2.0
ALTERNATIVES

2.0 ALTERNATIVES

This section describes the alternatives that will be analyzed in the EA. The alternatives were selected based on their potential to satisfy the purpose and need, specifically to provide year-round realistic training for ANG and DoD aviation units for global contingency deployments, and to provide realistic training in joint operations with foreign national units. As mentioned previously, delays in providing trained aircrew would hinder ongoing and future global support and create unacceptable risks to the aircrews and those U.S. and allied forces that they support. As viewed by the CEQ, an alternative is considered reasonable if it is deemed to be “practical or feasible” from a “technical and economic” standpoint.

In analyzing a range of alternatives, this EA includes the alternative of no-action, which allows the Air Force to compare the potential impacts of the proposed action and alternatives to the known impacts of maintaining the status quo. As such, the status quo is the “baseline,” or the benchmark, against which the impacts of the Proposed Action and alternatives are measured. Establishing a baseline is not an independent legal requirement in NEPA; however, doing so assists in conducting an informed and meaningful consideration of the alternatives. In the case of the 162 FW OSB operations at DMAFB, maintaining the status quo would mean continuing with the present course of action; that is, maintaining the current level of OSB training activity.

Establishing a baseline level of operations for OSB is complicated by the fact that the number and types of aircraft and operations vary from day to day and year to year. The Air Force originally proposed using the 2002 Environmental Assessment for the West Coast Combat Search and Rescue Beddown (the “CSAR EA”) due to the fact this was the most recent environmental assessment that captured OSB sorties. Once the environmental analysis of the Proposed Action began, it became apparent that the levels of OSB training events in 2002 were substantially higher than current operations. Moreover, as several members of the public pointed out during scoping meetings for this EA, the CSAR EA did not explicitly reference OSB flight operations or analyze them separately. They were simply included in the overall number of operations being conducted at DMAFB. Since the level of sorties in the CSAR EA did not effectively represent maintaining the current-day status quo, the CSAR EA was abandoned as the baseline.

In establishing an appropriate baseline, the Air Force considered the last 4 fiscal years for which it had complete operational data for OSB: 2007, 2008, 2009, and 2010. Of those 4 years, 2007 had the highest number of sorties (3,403), and 2010 had the fewest (1,100). With 1,190 sorties, 2009 closely approximated the average number of the sorties for the past 4 years (1,731). Thus, 2009 was determined to be an average year that would serve as the baseline, as it represents typical OSB training events at DMAFB.

During the scoping process for this EA, a number of the public comments received recommended the Air Force use 1978 (the year the original EA for OSB was completed) as a baseline. This is neither appropriate under NEPA, nor is it feasible. NEPA is a forward-looking statute in which agencies are not required to catalogue or exhaustively list and analyze all individual past actions. Constructing an alternative that is based on a set of conditions that have not existed for many years would be little more than an academic exercise. Instead, agencies conduct a cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. Moreover, the 1978 EA would not serve as a useful representation of current OSB operations for a number of reasons, not the least of which is that the 1978 EA assessed aircraft that are no longer flown by the Air Force, predated several construction projects related to OSB, and contains a dated level of analysis that would be considered immature and insufficient by today's standards. In order to provide a valid baseline for comparison, the Air Force would essentially be forced to rewrite the 1978 EA to be able to compare the impacts of proposed operations with type, nature, and quality of impacts occurring in 1978. The Air Force has determined that recreating a 34-year-old environmental baseline upon which to make present-day decisions would be unhelpful and not pragmatic.

Three alternatives have been identified, which would completely or partially satisfy the purpose and need to update and implement TP 60-1 including Annex C. The No Action Alternative is described in Section 2.1 and it will be carried forward for analysis, as required by CEQ regulations. The No Action Alternative will serve as the baseline to which the other action alternatives will be compared. The descriptions of the alternatives include the types of aircraft that are expected to participate in OSB training activities. In the event other aircraft are used in future training events, additional or supplemental NEPA documentation might be required.

2.1 No Action Alternative (Continuation of OSB at 2009 Levels)

The No Action Alternative typically describes the baseline of current operations that will be used to compare against the proposed action. In the case of ANG's OSB flight training operations, the levels of sorties during FY 2011 were not typical because repairs, including complete closures, on the DMAFB runway required the OSB training to be curtailed.

Table 2-1 presents the aircraft and associated sorties that participated in OSB during each of the 4 years. A sortie consists of a single aircraft conducting flight operations from initial takeoff to final landing, which represents at least two airfield operations (one takeoff and one landing). Analyses presented in this EA are based on the number of sorties conducted during a representative year.

DMAFB collected sortie and operation data during 2007 for all aircraft, including OSB aircraft, and analyzed the data as part of an ongoing effort to update the installation's AICUZ planning guidance (ACC 2007). A total of 3,403 OSB sorties occurred during that year with various aircraft, as shown in Table 2-1.

Table 2-1. Aircraft Used in OSB FY 2007 through 2010

Aircraft	FY 2007	FY 2008	FY 2009	FY 2010
	No. of Sorties	No. of Sorties	No. or Sorties	No. of Sorties
F-16	2,912	378	766	544
F-15	24	111		
GR-4 Tornado	180	173		132
Typhoon		173		
A-10C	287	122	252	24
HH-60 Pave Hawk		30	40	
SA 330 Puma		124	48	
GR 7/9 Harrier		122	84	
CH-53 Sea Stallion				41
AH-64 Apache				370
	3,403	**1,233**	**1,190**	**1,100**

Because 2007 OSB sorties were two to three times higher than would normally occur during a typical year, 2009 was chosen as a more representative level of OSB operations and was used in the baseline (No Action Alternative) noise analysis. OSB training activities in 2007 and 2008 were higher than normal, and in 2010 OSB activities decreased substantially below what is anticipated to be required for future training missions. Reductions of flight operations in 2010 and 2011 were partially due to repair and closure of the runway at DMAFB. Under the No Action Alternative, OSB activities would continue to be conducted at or below the 2009 levels.

The No Action Alternative forms the basis for analysis of other action alternatives, as described below.

2.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

The Proposed Action or Preferred Alternative is to update and implement NGB TP 60-1 at DMAFB, which would involve the use of ANG, Reserve, and DoD aircraft, as well as foreign national aircraft, for year-round training under OSB. The ANG 162 FW Det 1 coordinates all OSB activities. OSB headquarters and ramp space are located in the north-central part of DMAFB, east of DMAFB's runway (Figure 2-1). OSB training events would occur any time during the year, depending upon range and airspace availability. Units would typically deploy for approximately 2 weeks (training event) and include a maximum of 24 officers, 116 enlisted personnel, and 12 aircraft. Up to 12 training events per year are typically conducted.

Equipment to support each unit's training deployment is typically transported via C-130 aircraft supplied by the ANG. Up to four C-130 aircraft are utilized for deployment and redeployment. Visiting unit personnel stay on DMAFB, unless base housing is not available. Accommodations are made at local hotels in the event that sufficient on-base housing is not available; however, these situations are not common. Similarly, overlapping deployments are avoided to the extent practicable.

The anticipated number of training sorties would be planned to not exceed 1,920 per year. During each training event, a maximum of 16 sorties per day would be planned, with up to 160 sorties per 2-week training event. The daily maximum number of sorties could be exceeded if inclement weather or other exigent circumstances occur that limit sorties on previous days; however, deviations from the daily maximum number would have to receive prior approval from OSB Command and Control per the updated NGB TP 60-1. In addition to the training sorties, OSB annual activities would include up to 240 sorties for deployment and redeployment of participating aircraft and 96 cargo sorties that support OSB operations. Therefore, up to 2,256 total sorties per year would be associated with OSB. This level of sorties approximates 7 percent of the total annual sorties flown for all activities at DMAFB.

Although the F-16 and A-10 are the primary NGB aircraft participating in OSB, accounting for approximately 60 percent of the number of sorties and total number of hours in the past 3 FYs, additional U.S. aircraft that would be expected to participate include, but are not limited to, F-18

Figure 2-1: Existing Snowbird Office Location

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E/F, F-22, AV-8, MC-12, C-127, and MV-22. Additional international aircraft such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale, would be expected to participate, depending upon requests received from foreign nations and approval by the Secretary of the Air Force. Additional helicopters anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725. DMAFB Instruction 11-250 "Flying Operations" restricts flying operations between 10:30 p.m. and 6:30 a.m.; OSB activities would comply with these and other restrictions established by DMAFB. However, some OSB sorties would occur between the hours of 10:00 p.m. and 7:00 a.m. to provide realistic training, such as the use of night vision goggles. It is anticipated that less than 2 percent of the sorties would occur during these hours. Landings would occur on Runway 30 during these times and reduce noise emissions over residential areas, to the extent practicable. The runway is also closed the last Saturday of each month for maintenance.

2.2.1 Munitions

Several types of live and inert munitions, flares, and chaff would be used during training missions. These typically would include Mk-84 2000-pound and Mk-82 500-pound general purpose warheads, CBU-87 cluster bombs, AGM-65 Maverick Missiles, as well as 30mm and 20mm cannons, and .50 cal and 7.62mm machine guns (from helicopters). The Mk-82 was the most commonly used munition in the past 3 years; since FY 09, 338 Mk-82 bombs have been dropped during OSB training missions. The chaff and flares anticipated to be used include RR-188 chaff and M-206 and MJU-7 self-protection flares. Ordnance handling procedures for aircraft operating out of the OSB ramp would strictly comply with all USAF and ANG regulations. In addition, live munitions assembly and the weapons system loading procedures are also routinely inspected and certified by weapon safety officers from both 162 FW and the 355 FW, rather than requiring just one inspection/certification, which is typical at most bases.

2.2.2 Airspace

As mentioned previously, DMAFB has numerous restricted areas, MOAs, MTRs, and ATCAA available for use by DMAFB and ANG aircraft. Air traffic is coordinated with the Federal Aviation Administration (FAA), which maintains staff at DMAFB, and each scheduling agency has a separate Letter of Agreement with the Albuquerque Air Route Traffic Control Center (ARTCC). MTRs typically used by OSB units are VR-259, 260, 263, and 268/7/9. Some of the slower aircraft (e.g., A-10, C-130, and helicopters) use the A-10 Low Altitude Tactical Navigation (LATN) area to transit to/from DMAFB and BMGR. All aircraft using this LATN must follow the

rules described in DMAFB Instruction 11-250 and AFI 13-12 LAFBSUP 1. Competition for some airspace is stringent, but because the airspace is so vast, scheduled flights are well below capacity. The BMGR, however, operates near capacity (currently estimated to be at 97 percent capacity); thus, its availability for munitions delivery is often a limiting factor for training. Table 2-2 lists the airspace and altitude restrictions available for training operations.

Table 2-2. Annual Training Airspace Near DMAFB

Airspace Unit	Floor (feet)	Ceiling Feet	Scheduling Office
Outlaw MOA/ATCAA	8,000 MSL	FL510	162 FW (ANG)
Jackal MOA/ATCAA	11,000 MSL	FL510	162 FW (ANG)
Jackal Low MOA	100 AGL	10,999 MSL	162 FW (ANG)
Reserve MOA/ATCAA	5,000 AGL	FL510	162 FW (ANG)
Morenci MOA/ATCAA	1,500 AGL	FL510	162 FW (ANG)
Tombstone A MOA	500 AGL	14,499 MSL	355 FW (DMAFB)
Tombstone B MOA	500 AGL	14,499 MSL	355 FW (DMAFB)
Tombstone C MOA/ATCAA	14,500 MSL	FL510	355 FW (DMAFB)
Mustang (R-2303B)	8,000 MSL	FL300	Fort Huachuca
Ruby MOA/ATCAA	10,000 MSL	FL510	162 FW (ANG)
Fuzzy MOA	100 AGL	9,999 MSL	162 FW (ANG)
Sells Low MOA	3,000 AGL	9,999 MSL	56 FW (Luke AFB)
Sells MOA/ATCAA	10,000 MSL	FL510	56 FW (Luke AFB)
R-2301E (NTAC/STAC/A-A)	Surface	FL800	56 FW (Luke AFB)
R-2304 (ETAC)	Surface	FL240	56 FW (Luke AFB)
R-2305	Surface	FL240	56 FW (Luke AFB)
AR-613	16,000 MSL	FL280	355 FW (DMAFB)
AR-639	16,000 MSL	FL280	355 FW (DMAFB)
AR-639A	13,000 MSL	FL280	355 FW (DMAFB)
AR-647	10,000 MSL	FL290	56 FW (Luke AFB)

AGL=Above Ground Level, FL=Flight Level, MSL=Mean Sea Level

MTRs, ATCAAs, and MOAs expected to be used during OSB training activities are presented in Figure 2-2. Once the training mission within the assigned airspace is accomplished, aircraft will return to DMAFB for a full-stop landing (i.e., no touch and go's). No pattern work (e.g., touch and go's) around DMAFB is planned under OSB operations.

The airspace units shown in Table 2-2 and Figure 2-2 are examples of airspace proposed to be used by OSB. With proper scheduling, OSB training could be accommodated without modification to airspace and would result in negligible to no impacts on overall airspace

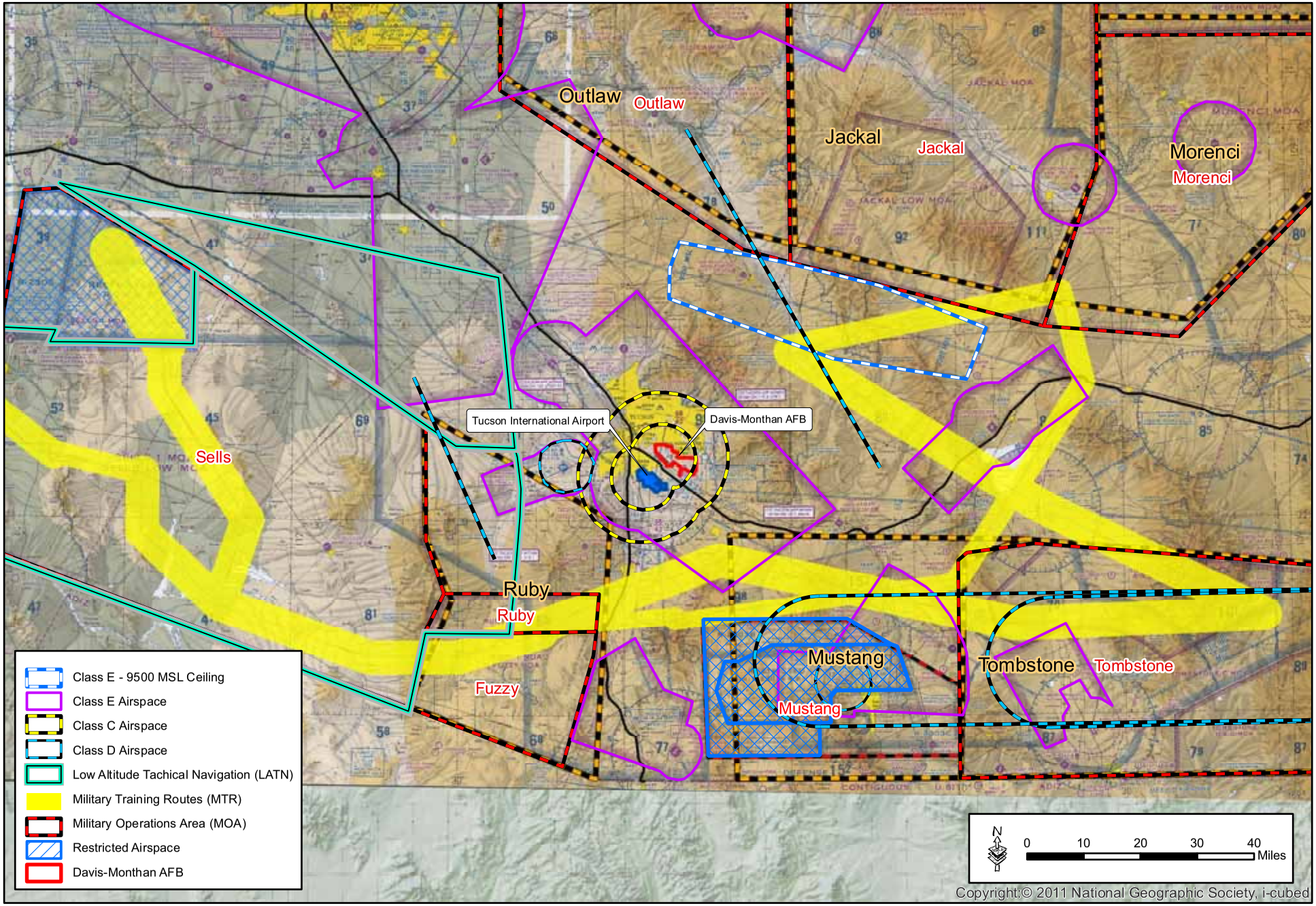

Figure 2-2: MTRs, ATCAAs, LATNs and MOAs Used by OSB

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management in the region. Airspace units are managed by the Federal agencies who established the airspace, and use of the airspace would comply with the guidelines identified for each unit. OSB will coordinate with 162 FW and 355 FW and the appropriate airspace managers to schedule training missions and avoid conflicts with airspace.

NGB has instituted numerous procedures to reduce noise emissions and enhance public safety in the areas surrounding DMAFB. Every visiting unit would receive the OSB briefing (known as the Local Area Brief) regarding noise abatement requirements and procedures for flights over urban areas. These briefings would be presented by OSB and the 355 FW to impart the importance of compliance with the procedures and requirements. In addition, all OSB aircraft that are below 10,000 feet above ground level (AGL) and within 30 nautical miles of DMAFB would be restricted to a maximum airspeed of 350 knots on departure or 300 knots on recovery (i.e., approaching DMAFB for landing). This approach to DMAFB has been specifically tailored so the visual traffic pattern followed by landing aircraft keeps them as high as possible for as long as practicable. To further abate noise, departures would use Runway 12 and arrivals would use Runway 30, to the extent practicable. This action would concentrate the majority of the air traffic noise southeast of DMAFB and away from the majority of the population near downtown Tucson.

Whenever OSB aircraft depart DMAFB with live weapons on board, the departure would be required to be on Runway 12; OSB aircraft with unexpended live weapons would recover only to Runway 30. OSB aircraft with hung or unsafe live ordnance would not return to DMAFB; instead, they would be diverted to an alternate recovery location.

2.3 Alternative 2. Continuation of OSB at 2002 Levels

Under Alternative 2, OSB sorties would continue at DMAFB at the same level and with the aircraft analyzed in the 2002 CSAR EA, which is incorporated herein by reference (ACC 2002). The number of sorties flown at DMAFB, including OSB activities, were identified in Table 2.3.4 of the 2002 CSAR EA and compared to the proposed CSAR and routine DMAFB sorties. That table is replicated below in Exhibit 1.

Exhibit 1. Table Excerpted from 2002 CSAR EA

Aircraft	2002 CSAR Baseline/No Action Alternative		2002 CSAR EA Proposed Action		2002 CSAR EA Total	
	Day	Night	Day	Night	Day	Night
A/OA-10	14,341	0	0	0	14,341	0
EC-130	2,198	118	0	0	2,198	118
HC-130	0	0	700	300	700	300
HH-60	624	156	1,400	350	2,024	506
Other[b]	2,129	0	0	0	2,129	0
Total	**19,292**	**274**	**2,100**	**650**	**21,392**	**924**

Notes: [a] Night operations occur between 10 p.m. and 7 a.m.
[b] Other aircraft = F-16, F-15, FA-18, KC-135, C-17, C-5, C-141, helicopters, and general aviation aircraft.
Source: ACC 2002

The "other" aircraft identified in this table and footnote (see Exhibit 1) was attributable to aircraft participating in OSB. In addition, the 2,129 sorties for "other" aircraft included 150 sorties by Air Sovereignty Alert (ASA) aircraft, which were not associated with OSB. Therefore, it is estimated that approximately 1,979 OSB sorties were evaluated in the 2002 CSAR EA. However, this EA did not assess all aircraft flown by all coalition partners. The types of aircraft proposed for use under this alternative, as described in the 2002 CSAR EA, would be F-16, F-15, FA-18, KC-135, C-17, C-5, C-141, and various helicopters. These aircraft are operated by ANG, Reserve, and other DoD units; some foreign units would also operate F-16, and F-15 aircraft during OSB training events.

Alternative 2 would result in 12 percent less OSB sorties, as compared to Alternative 1 discussed above, and would exclude numerous coalition partners. This would substantially hinder successful coalition contingency training, since it would eliminate the participation by all Foreign units except those that fly U.S. aircraft (e.g., F-16).

2.3.1 Munitions

The same type of munitions described for Alternative 1 would be deployed under Alternative 2. The quantity would be expected to be decreased by the proportionate reduction (12 percent) in sorties.

2.3.2 Airspace

OSB aircraft operating under Alternative 2 would utilize the same airspace as Alternative 1.

2.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

This alternative would involve the same level of sorties (1,979) and aircraft described for Alternative 2, but would include additional international aircraft such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale. Other similar international aircraft could be used, depending upon requests received from foreign nations and approval by the Secretary of the Air Force. Additional helicopters anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725.

2.4.1 Munitions

The same type of munitions described for Alternative 1 would be deployed under Alternative 3. The quantity would be expected to be decreased by the proportionate reduction (12 percent) in sorties.

2.4.2 Airspace

OSB aircraft operating under Alternative 3 would use the same airspace as Alternative 1.

2.5 Alternatives Eliminated

Alternatives to relocate OSB to other installations were posed by several comments during the scoping process, as indicated previously. Alternative locations suggested included the Gila Bend Auxiliary Air Field, Libby Army Air Field, Luke AFB, and TIA. Relocation of the OSB operations to other installations would require substantial time to plan, design, and construct the necessary facilities and infrastructure at other installations. The facilities identified previously in Section 1.2 would require replication at the new location, and many of these facilities/assets could not be replicated (e.g., LOLA and munitions dump, 13,643-foot runway, on-base master mechanics). Replicating such facilities and assets would require substantial delays, which would have significant adverse effects on the military's training mission and need to support the ongoing and potential contingency operations. Such delays would result in the inability of commanders to satisfy their global support missions and create substantial risks to the health and safety of the aircrews, as well as the U.S. and allied forces on the ground.

In addition, relocation of OSB to another installation would not satisfy the purpose and need (i.e., update and implement the TP 60-1). Relocation would not assist in the update of TP 60-1 and would restrict establishing necessary training requirements for the Total Force and foreign national units. Consequently, these alternatives were eliminated from further consideration.

2.6 Comparative Summary of Alternatives and Impacted Resources

A summary of the aircraft and number of sorties proposed for each alternative carried forward for analysis is presented in Table 2-3.

Table 2-3. Summary of Alternatives

Alternative	No. Sorties	Types of Aircraft		
		U.S. Jets	U.S. Helicopters	Foreign Aircraft
No Action Alternative	1,190			
Alternative 1 (Preferred Alternative)	2,256			
Alternative 2	1,979			
Alternative 3	1,979			

Potential environmental impacts of the Proposed Action and other alternatives would be those primarily associated with the takeoff and landings at DMAFB, since there is no proposed expansion of restricted or limited airspace, no permanent increase in staff, and no new facility construction. Table 2-4 presents a summary of the impacts expected to occur under each alternative. These impacts are described in more detail in Section 4 of this EA.

Table 2-4. Summary of Impacts

Resource	No Action Alternative	Alternative 1: Preferred Alternative	Alternative 2	Alternative 3
Noise	No additional increase in noise	Slight expansion of 65-decibel (dB) and 70-dB noise contour southeast and northwest of the base; 17 residences and three residences affected by increase in the 65-dB and 70 - decibel contours, respectively.	Same as Alternative 1	Same as Alternative 1
Air Quality	No additional emissions associated with No Action Alternative	Annual emissions of carbon monoxide (31.16 tons) and particulate matter (0.18 ton) would be below *de minimis* thresholds.	Annual emissions of carbon monoxide (28.28 tons) and particulate matter (0.15 ton) would be below *de minimis* thresholds.	Annual emissions would be similar to Alternative 2
Socioeconomics	No additional activity would occur that would affect socioeconomic conditions	No adverse effects on population or public education would occur. Benefits would occur as units are deployed to Tucson area and increasing expenditures on hotels, car rentals, fuel, and meals. No displacement or relocation of residences or other community facilities would occur; thus, no adverse effects on community cohesion would be expected.	Same as Alternative 1	Same as Alternative 1
Property Values	No effect on property values	No effect on property values would be expected.	Same as Alternative 1	Same as Alternative 1
Environmental Justice	Disproportionate number of minority and low-income populations are affected by noise, compared to the City of Tucson.	No significant increase of impacts on minority and low-income populations would occur as the 30-50 feet contour expansion would likely be imperceptible to residents.	Same as Alternative 1	Same as Alternative 1
Public Safety	No additional increase in public risks would be expected.	Slight increase in potential risk factor due to the increase number of sorties to be flown under this alternative. However, risk factor is extremely low and OSB safety record of 0 mishaps would be expected to continue.	Same as Alternative 1	Same as Alternative 1

SECTION 3.0
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

This section presents information on environmental conditions for resources potentially affected by the Proposed Action and alternatives described in Chapter 2.0. Under NEPA, the analysis of environmental conditions should address only those areas and environmental resources with the potential to be affected by the proposed alternatives; locations and resources with no potential to be affected are not required to be analyzed. The environment includes the natural environment, as well as the socioeconomic, cultural, and physical resources associated with the human environment.

In the environmental impact analysis process (EIAP), the resources analyzed are identified and the expected geographic scope of potential impacts, known as the region of influence (ROI), is defined. For the proposed update and implementation TP 60-1, the ROI is the area immediately surrounding DMAFB and Pima County.

Since no construction or other ground disturbance is included as part of the Proposed Action or alternatives and no increase in operational support staff is anticipated, impacts on cultural and natural resources, water quality and supply, soils and geology, land use, and public services, are not expected and, thus, will not be discussed further.

3.1 Noise

Noise is generally described as unwanted sound, which can be based either on objective effects (i.e., hearing loss, damage to structures) or subjective judgments (e.g., community annoyance). Human response to noise can vary according to the type and characteristic of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day. Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Thus, a 10 dB increase in noise corresponds to a 100 percent increase in the perceived sound. Under most conditions, a 5 dB change is necessary for noise increase to be noticeable (U.S. Environmental Protection Agency [USEPA] 1972). The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

When measuring environmental noise, the characteristics of human hearing are taken into account by using the “A-weighted” (dBA) decibel scale, which de-emphasizes the very high and very low frequencies to approximate the human ear’s low sensitivity to these frequencies and

emphasizes the mid-range frequencies (between 1,000 and 4,000 cycles per second). This weighting provides a good approximation of the response of the average human ear and correlates well with the average person's judgment of the relative loudness of a noise event.

People are typically more sensitive to elevated noise levels during the evening and/or night hours when human activity may be more relaxed. To account for increased human sensitivity to noise at night, a 10 dB penalty is applied to nighttime aircraft operations (10 p.m. to 7 a.m.).

The Noise Control Act of 1972 (PL 92-574) and several other Federal laws require the Federal government to set and enforce uniform noise standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, medium and heavy duty trucks, motorcycles and mopeds, portable air compressors, Federal highway projects, and Federal housing projects. The Noise Control Act also requires Federal agencies to comply with all Federal, state, and local noise requirements. Most Federal noise standards focus on preventing hearing loss by limiting constant exposure to sounds of 90 dB over an 8-hour work period or over 85 dB over a 16-hour period (USEPA 1978).

Noise levels are computed over a 24-hour period and represented as day-night average sound level (DNL). The DNL noise metric incorporates a "penalty" for nighttime noise events occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance. DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). Examples of public responses (i.e., annoyance) to various noise levels are presented in Figure 3-1. A DNL of 65 dBA is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA, as a level below which there is no adverse impact (USEPA 1974).

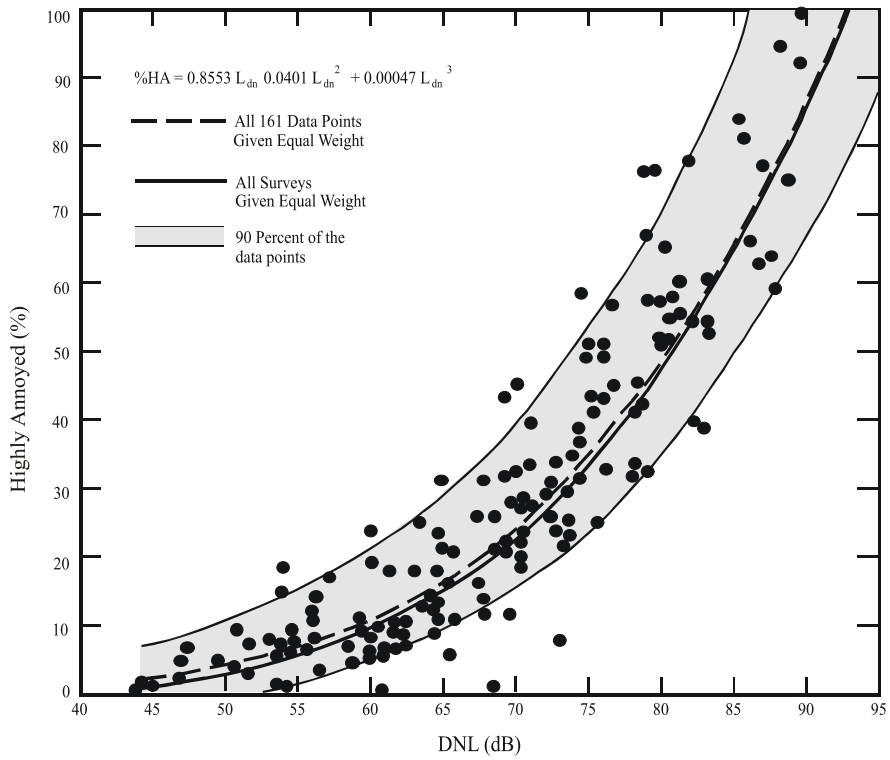

Figure 3-1. Public Annoyance from Noise Exposure (from Shultz 1978)

A single-event noise, such as an overflight, is described by the sound exposure level (SEL). Several examples of single-event noise levels (SEL) produced by different military aircraft at various altitudes are presented in Table 3-1. These levels could produce hearing loss if a person were exposed to such noise for long durations (e.g., constant levels over several hours). Other physiological issues could also occur, including stress, if persons or wildlife were constantly exposed to levels this high or for long periods. Of course, many variables can affect SEL, including atmospheric conditions, power settings, aircraft airspeed, altitude and attitude of the aircraft, and the engine fan speed and turbine inlet temperature.

Table 3-1. Representative SEL for Typical Aircraft Under Flight Track at Various Altitudes

Aircraft	Airspeed	Power *	Altitude (in Feet) Above Ground Level				
			500	1,000	2,000	5,000	10,000
F-15C	520	81%NC	114	107	99	86	74
F-16C	450	87%NC	104	96	89	77	66
F/A-18E/F	360	83%N2	106	99	90	77	65
C-130H	170	970 TIT	92	85	77	66	57

* %NC = percent engine core revolution per minute
%N2 = percent revolution per minute at engine stage #2
TIT = Turbine Inlet Temperature in ° Centigrade

The U.S. Air Force adopted noise policy to promote the health, safety, and welfare of persons in the vicinity of installations affected by long-term aircraft noise (Air Force Handbook [AFH] 32-7084, 1999). The policy instructs the managers of air installations that residential land uses are discouraged within the 65 to 69 dBA DNL noise contour and strongly discouraged in 70 to 74 dBA DNL noise contour. The AFH also instructs air installations to consider these guidelines before major mission changes, new aircraft, and realignments affecting flying operations, as well as when there would be an increase in nighttime flights. Table 3-2 presents the AFH 32-7084 guidance policy for land use found near DMAFB.

Table 3-2. Air Force Land Use Compatibility Guidelines

Land Use	Noise Zones (dB)			
	65-69	70-74	75-79	80-84
Residential: single units, condos, apartments	A[1]	B[1]	No	No
Educational Services (schools)	A[1]	B[1]	No	No
Residential Hotels	A[1]	B[1]	No	No
Recreational activities	Yes*	A*	B*	No
Outdoor cultural, entertainment, and recreation	Yes*	Yes*	No	No
Nature Exhibits	Yes*	No	No	No
Government Centers	Yes*	A*	B*	No
Hospitals	A*	B*	No	No
Cultural activities (including churches)	A*	B*	No	No

Source: AFH 32-7084, 1999.
Key:
Yes - Land use and related structures are compatible without restriction.
No - Land use and related structures are not compatible and should be prohibited.
Y* - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.
N* - (no with exceptions) - See notes indicated by the superscript.
NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.
A, B, or C - Land use and related structures generally compatible; measures to achieve NLR for A (DNL/CNEL 65-69), B (DNL/CNEL 70-74), C (DNL/CNEL 75-79), need to be incorporated into the design and construction of structures.
A*, B*, and C* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.
***** - The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

A[1]. Although local conditions may require residential use, it is discouraged in DNL/CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.
B[1]. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated into building codes and considered in individual approvals.

Aircraft flying in airfield airspace generally adhere to established flight paths and overfly the same areas surrounding the airfield on a consistent basis. At DMAFB, noise from flight operations typically occurs beneath main approach and departure corridors and in areas

immediately adjacent to parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from existing background noise. Land use guidelines identified by the Federal Interagency Committee on Urban Noise (FICUN) are used to determine compatible levels of noise exposure for various types of land use surrounding airports (FICUN 1980). Noise contours are frequently used to help determine compatibility of aircraft operations with local land use. The Joint Land Use Study (JLUS) for DMAFB reported that residences were generally considered as a non-compatible use within the 65-69 DNL contour and that residential use in these affected areas was limited to existing residential lots only (Arizona Department of Commerce 2004).

In addition to the AFH 32-7084 described above, the DoD issued Department of Defense Instruction 4165.57 which instructs the managers of air installations to work with local governments to discourage residential developments within the 65 to 69 DNL noise contours, and strongly discourage such developments within the 70 to 74 DNL noise contours. Figure 3-1 presents the baseline DNL 65 to 85 dB noise contours in 5 dB increments surrounding the DMAFB airfield. These contours were developed using the 2007 Noise Data Collection, Review, and Validation Study (ACC 2007). Hereinafter, that study is referred to as the 2007 Noise Study. Table 3-3 presents the baseline land acreage and residences exposed to noise levels greater than 65 dB (DNL) based on yearly aircraft operations identified in the 2007 Noise Study.

Table 3-3. Structures and Acreage Off-Base within the 65 and 70 dB DNL Contours

Noise Contour (DNL) Baseline	Single-Family Residences	Multifamily Residences	Other Buildings	Acres
65-69 dB	811	134	14	970
70-75 dB	15	14	0	114
75-80 dB	0	0	0	0
Total	**826**	**148**	**14**	**1,084**

* *Other buildings are government structures*

As indicated earlier, DNL correlates well with human annoyance. As DNL values increase, the number of people expected to be annoyed also increases. Off-base, there are 811 single-family and 134 multifamily (i.e., duplexes, 4-plexes, and apartment complexes) within the existing 65-69 dB DNL contour. In addition, 14 government buildings are located within this footprint.

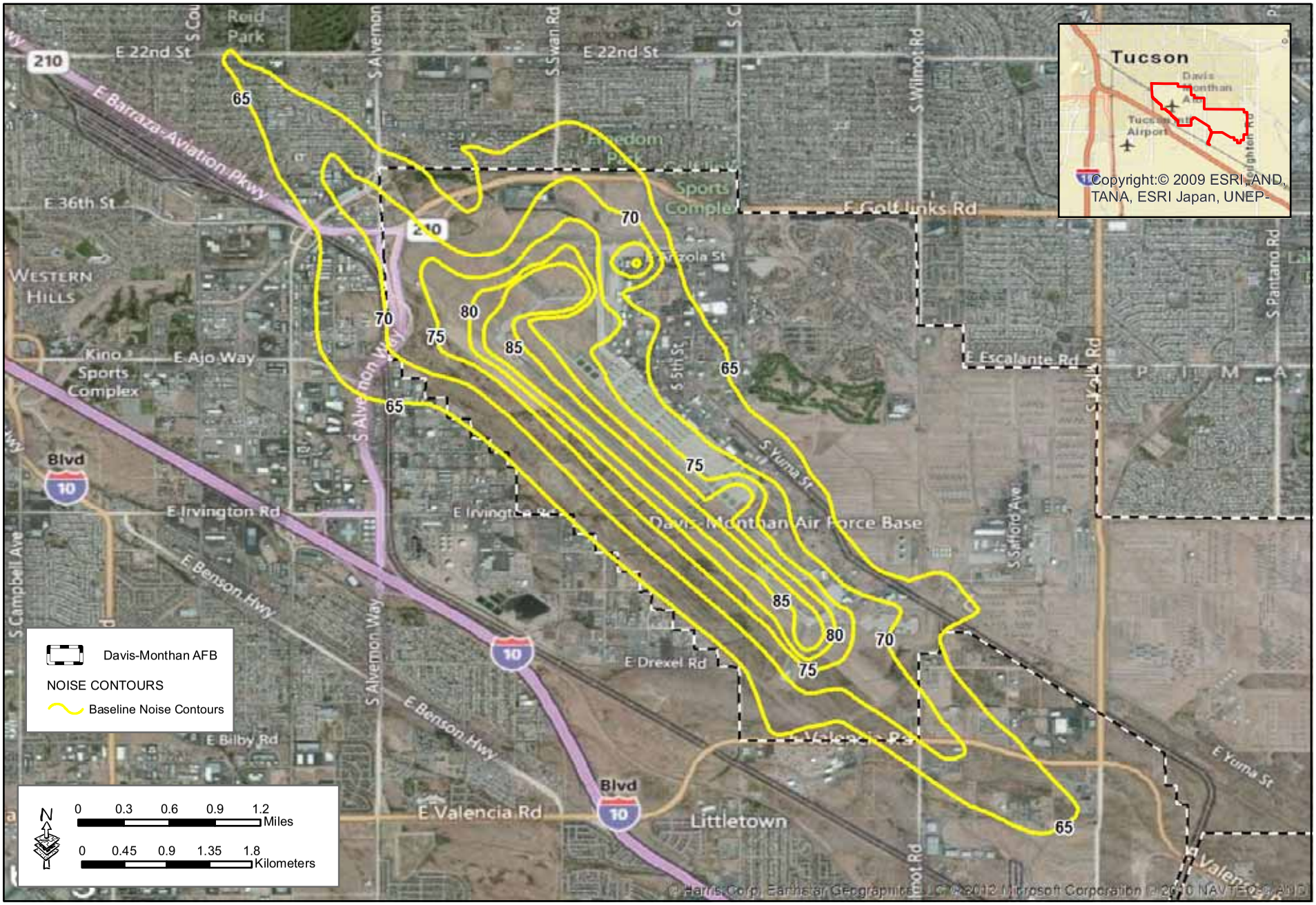

Figure 3-2. Baseline Noise Contours at Davis-Monthan AFB

GSRC

June 2012

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There are also 15 single-family and 14 multifamily off-base residences within the 70-74 dB DNL contour.

3.2 Air Quality

3.2.1 Affected Environment

The USEPA established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public. Ambient air quality standards are classified as either "primary" or "secondary." The major pollutants of concern, or criteria pollutants, are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (PM-10), particulate matter less than 2.5 microns (PM-2.5), and lead. NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in Table 3-4.

Areas that do not meet these NAAQS standards are called non-attainment areas; areas that meet both primary and secondary standards are known as attainment areas. Areas that were in non-attainment, but that are presently in compliance with air quality standards, are called maintenance areas. The Federal Conformity Final Rule (40 CFR Parts 51 and 93) specifies criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Rule was first promulgated in 1993 by the USEPA, following the passage of Amendments to the Clean Air Act in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

A conformity analysis is the process used to determine whether a Federal action meets the requirements of the General Conformity Rule. It requires the responsible Federal agency to evaluate the nature of a proposed action and associated air pollutant emissions and then calculate emissions as a result of the proposed action. If the emissions exceed established limits, known as *de minimis* thresholds, the proponent is required to implement appropriate mitigation measures. The USEPA considers Pima County as a moderate non-attainment area for PM-10 and a maintenance area for CO (USEPA 2010b). The *de minimis* threshold for both moderate non-attainment for PM-10 and maintenance CO is 100 tons per year (40 CFR 51.853).

Table 3-4. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Times
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour [1]	None	
	35 ppm (40 mg/m^3)	1-hour [1]		
Lead	0.15 µg/m^3 [2]	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	53 ppb [3]	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour [4]	None	
Particulate Matter (PM-10)	150 µg/m^3	24-hour [5]	Same as Primary	
Particulate Matter (PM-2.5)	15.0 µg/m^3	Annual [6] (Arithmetic Average)	Same as Primary	
	35 µg/m^3	24-hour [7]	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour [8]	Same as Primary	
	0.08 ppm (1997 std)	8-hour [9]	Same as Primary	
	0.12 ppm	1-hour [10]	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour [1]
	0.14 ppm	24-hour [1]		
	75 ppb [11]	1-hour	None	

Source: USEPA 2010a at http://www.epa.gov/air/criteria.html
Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb - 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air (µg/m^3).
[1] Not to be exceeded more than once per year.
[2] Final rule signed October 15, 2008.
[3] The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard
[4] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
[5] Not to be exceeded more than once per year on average over 3 years.
[6] To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
[7] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
[8] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
[9] (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) USEPA is in the process of reconsidering these standards (set in March 2008).
[10] (a) USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
[11] (a) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Greenhouse Gases and Climate Change

Greenhouse gases (GHG) are gases that trap heat in the atmosphere. They include water vapor, CO_2E, methane, nitrous oxide, fluorinated gases including chlorofluorocarbons and hydrochlorofluorocarbons, and halons, as well as ground-level O_3 (California Energy Commission 2007).

GHG Threshold of Significance

The CEQ provided draft guidelines for determining meaningful GHG decision-making analysis, which are currently undergoing public comment at this time; however, the draft guidance states that if the proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons (MT) or more of CO_2E GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 MT of CO_2E, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ 2010).

3.3 Socioeconomics and Environmental Justice

3.3.1 Socioeconomics

This socioeconomics section outlines the basic attributes of population and economic activity within the ROI for DMAFB and vicinity. The ROI is Pima County, which is also the one county that makes up the Tucson Metropolitan Statistical Area.

3.3.1.1 Population

The population of Pima County grew by more than 136,000 from 2000 to 2010 (from 843,742 in 2000 to 980,263 in 2010), an increase of 16.2 percent, as shown in Table 3-5. The State of Arizona experienced an even higher growth rate of almost 25 percent from 2000 to 2010. This growth followed even larger growth rates in the 1990-2000 time period of more than 25 percent for Pima County and 40 percent for the state. The U.S. as a whole experienced much lower growth rates of 9.7 percent from 2000 to 2010 and 13.2 percent from 1990-2000. The DMAFB ROI/Pima County accounts for about 15 percent of the population of Arizona.

Table 3-5. Population - Davis-Monthan ROI/Pima County

	Pima County/ROI		Arizona	
	Population	Growth Rate	Population	Growth Rate
2010	980,263	16.2%	6,392,017	24.6%
2000	843,742	25.5%	5,130,607	40.0%
1990	666,880		3,665,228	

Source: U.S. Census Bureau, 2010 Census

More than 18,000 people are directly associated with DMAFB. Table 3-6 shows military and military dependents, as well as civilian and contract employees.

Table 3-6. DMAFB Personnel

	Total
Military	7,136
Military Dependents	8,328
Civilian Employees	1,430
Contract Employees	1,764
Total	18,658

Source: FY 11 Davis-Monthan AFB Economic Impact Analysis

According to the 2010 Census, 55 percent of Pima County's population is white non-Hispanic and 35 percent is of Hispanic or Latino origin. Approximately 3.5 percent is black, and 3.5 percent is American Indian or Alaska Native. Pima County is slightly more diverse than the state as a whole, which was approximately 58 percent white non-Hispanic, according to the 2010 Census. Approximately 13 percent of the population of Pima County is foreign born, while 28 percent of persons age 5 years and above report speaking a language other than English at home.

3.3.1.2 Education

The 2009-2010 Annual Report for the Arizona Department of Education reports that there were 130,607 students enrolled in the 18 local public school districts in Pima County. These districts together have 225 elementary schools (pre-school through 8th grade), 90 high schools, and 51 combined schools. The largest of the school districts is the Tucson Unified School District (TUSD), which accounted for approximately 40 percent of the county's public school students.

The TUSD has closed a number of schools in the past few years. The Julia Keen Elementary School was closed in 2004, and with base closures across the country associated with the Base Closure and Realignment Act of 2005, there was concern that the location of the Julia Keen School might contribute to a decision to close DMAFB due to its proximity to the DMAFB flight path (*Tucson Citizen*, May 12, 2004 and July 27, 2004, and TUSD personal communication). In 2010, TUSD closed nine schools, including one, Roberts Elementary, within a mile of the Julia Keen School. These nine schools were closed to cut costs and to generate revenue from the vacated properties.

There are also several postsecondary education institutions in the Tucson area, including the University of Arizona, which is rated among the top 20 research universities in the country and has approximately 38,000 undergraduate, graduate, and professional students. Other postsecondary schools include Pima Community College, which has six campuses and several learning and education centers, including the DMAFB Education Center, the University of Phoenix, and Prescott College.

Of Pima County of persons who are 25 years or older, an estimated 86.4 percent are high school graduates and 29 percent have a Bachelor's degree or higher. This is above the Arizona rate of 83.9 percent high school graduates and 25.7 percent with a Bachelor's degree or higher, as well as the national averages of 84.6 percent high school graduates and 27.5 percent with a Bachelor's degree or higher (U.S. Census Bureau QuickFacts 2010).

3.3.1.3 Housing

Housing characteristics are presented in Table 3-7. Owner-occupied units account for 65.9 percent of total units in the ROI, which is below the average for the state as a whole (68.3 percent) but only slightly below the U.S. average of 66.9 percent. There are almost 50,000 vacant housing units in the ROI (Pima County). This 11.9 percent vacancy rate for the ROI is exactly the same as the national average and noticeably below the State of Arizona's vacancy rate of 15.4 percent.

Table 3-7. ROI/Pima County Housing

	Pima County/ROI	Arizona	U.S.
Total Units	419,647	2,657,551	127,699,712
Owner-occupied	65.9%	68.3%	66.9%
Renter-occupied	34.1%	31.7%	33.1%
Vacant Units			
Number	49,383	409,381	15,068,566
Percent	11.8	15.4	11.8
Median Value*	$196,900	$218,400	$185,400

Source: U.S. Census Bureau, American Community Survey – 5-Year Estimates
*Owner-occupied homes

3.3.1.4 Employment

Labor force and employment data are shown in Table 3-8. There were over 486,000 people in the labor force in the ROI. The unemployment rate of 8.3 percent (August 2011) in the

ROI/Pima County is below the rate for Arizona and the nation in September 2011, as well as the 2010 average.

Table 3-8. Labor Force and Employment

	Pima County	Arizona	U.S.
Civilian Labor Force	486,254	3,158,829	153,594,000
Employed	445,737	2,863,923	139,627,000
Unemployed	40,517	294,906	13,967,000
Unemployment Rate – August 2011	8.3%	9.3%	9.1%
Unemployment Rate – 2010 Average	9.0%	10.0%	9.6%

Source: Bureau of Labor Statistics, various tables. Data (other than the 2010 average) are for August 2011 – seasonally adjusted.

The ROI's largest employers include Raytheon Missile Systems and the University of Arizona, each with approximately 10,500 employees, as well as the State of Arizona (almost 8,900 employees) (Tucson Regional Economic Opportunities [TREO] 2011). With more than 10,300 military, civilian, and contract employees (DMAFB 2012), DMAFB is the third largest employer in the region. There are also several large healthcare companies in the region. The ROI is home to the University of Arizona Science and Technology Park (UA Tech Park), which houses over 40 companies and organizations, including Raytheon, IBM, Canon USA, and Citigroup, and more than 7,000 employees. The ROI has become known for high-technology optics companies, several of which are located in the 1,345-acre UA Tech Park.

While the region has a number of large employers, data from the U.S. Census Bureau's County Business Patterns show that 99.8 percent of the region's business establishments are considered small businesses based on the Small Business Administration's (SBA) definition (under 500 employees). Approximately 71.7 percent of establishments have less than 10 employees, slightly below the national average of 73.5 percent.

The ROI has a higher percentage of retail trade, accommodation and food services, and arts, entertainment, and recreation than the average for the nation, which is a reflection of the tourism industry in the region. The ROI also has higher than average employment in healthcare and social assistance, reflecting its importance as a regional healthcare center. The percentage of employees in manufacturing is about 17 percent below the national average, but it is above the average for the State of Arizona. The percentage of employees in wholesale trade is well below (about half) the national average.

Tourism is a major industry in the region. According to the Metropolitan Tucson Convention and Visitors Bureau, in 2010, tourism accounted for approximately 21,500 jobs in Pima County. The County has approximately four million domestic overnight visitors per year (2006). Visitors account for more than $2 billion in direct travel spending and generate more than $124 million in direct tax receipts annually (2010).

3.3.1.5 Income

Personal income data for 2009 for the ROI are shown in Table 3-9. Per capita personal income (PCPI) for the ROI/Pima County ($33,833) was slightly above PCPI for the state ($33,207) but only 87 percent of the U.S. PCPI of $38,846. Median household income in Pima County ($43,243) is 86 percent of the national median household income of $50,221. Median household income for Arizona ($48,711) is well above Pima County, but still slightly below the U.S.

Table 3-9. Personal, Per Capita, and Household Income

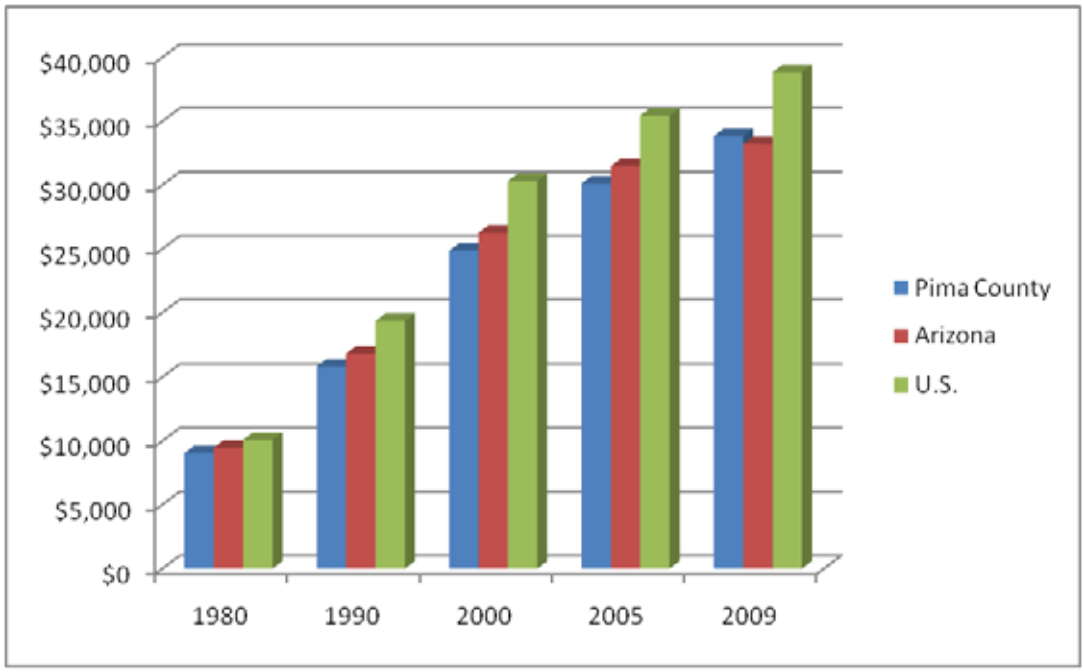
	2009		
	Pima County	**Arizona**	**U.S.**
Personal Income (thousands of dollars)	$34,516,424	$219,026,704	$11,916,808,000
Population (persons) [1]	1,020,200	6,595,778	306,771,529
PCPI (dollars) [2]	$33,833	$33,207	$38,846
PCPI as a percent of U.S.	87.1%	85.5%	
Median Household Income (dollars) [3]	$43,243	$48,711	$50,221

Source: U.S. Census Bureau, Bureau of Economic Analysis and Small Area Income and Poverty Estimates (SAIPE), 2009.
[1] Census Bureau midyear population estimates. Estimates for 2000-2009 reflect county population estimates available as of April 2010.
[2] Per capita personal income was computed using Census Bureau midyear population estimates. Estimates for 2000-2009 reflect county population estimates available as of April 2010.
[3] Median income in 2009 from Small Area Income and Poverty Estimates.
Personal and per capita state and local area dollar estimates are in current dollars (not adjusted for inflation).

Figure 3-3 presents historical PCPI data for the ROI, Arizona, and the nation. The data show that while PCPI in the ROI has increased over time, it remains noticeably below the national average.

The 2006-2010 poverty rate for Pima County was estimated to be 16.4 percent, above the State of Arizona's poverty rate of 15.3 percent and well above the U.S. poverty rate of 13.8 percent. Both the county and the state were up substantially from the 2000 poverty rates of 13.0 percent and 12.5 percent, respectively (US ACS 2006-2010).

Figure 3-3. Per Capita Personal Income, 1980-2009



Source: U.S. Census Bureau, Bureau of Economic Analysis

3.3.2 Property Values

Property value data were examined to assess the changes in property values since 2000 for Pima County as a whole and two smaller areas around the DMAFB flight path. The two groups of census tracts include 1) six census tracts that include the three underlying the 65 DNL noise contour plus three more that are very near the noise contour boundary (Census Group A); and 2) three census tracts underlying the 65 dB noise contour, excluding the census tract that is touched by the contour but covering an area where there are no homes (Census Group B), as shown in Figure 3-4. Figure 3-5 shows changes in average property value for Pima County by year from 2000 to 2011. Average property values in the area increased from 2000 through 2008 and then began to decrease, coinciding with the national housing market. Average property values in the two selected census tract areas increased more rapidly than the county through 2008, then decreased more rapidly in 2011.

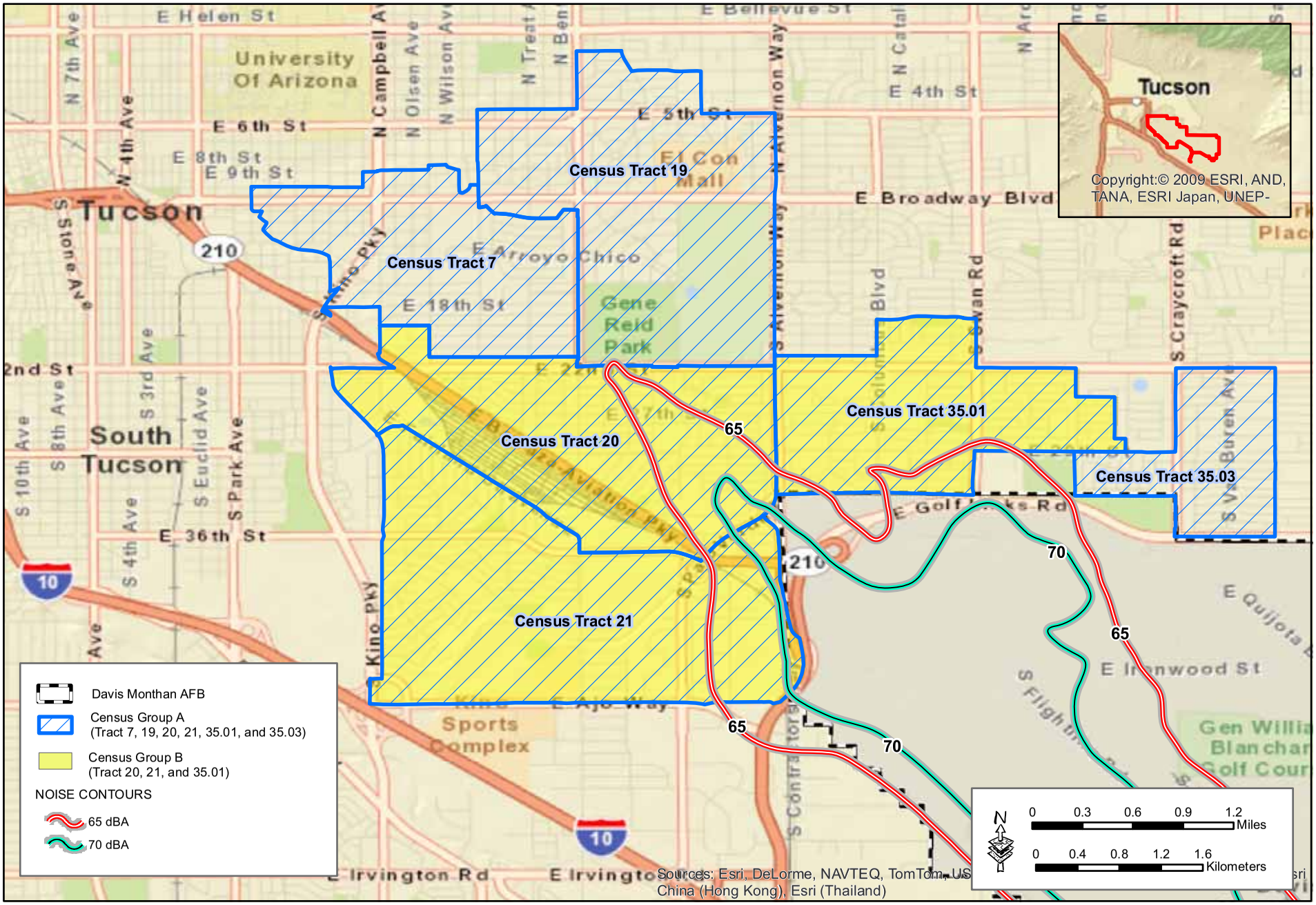


Figure 3-4. Census Tracts Within or Adjacent to 65 dBA Noise Contours

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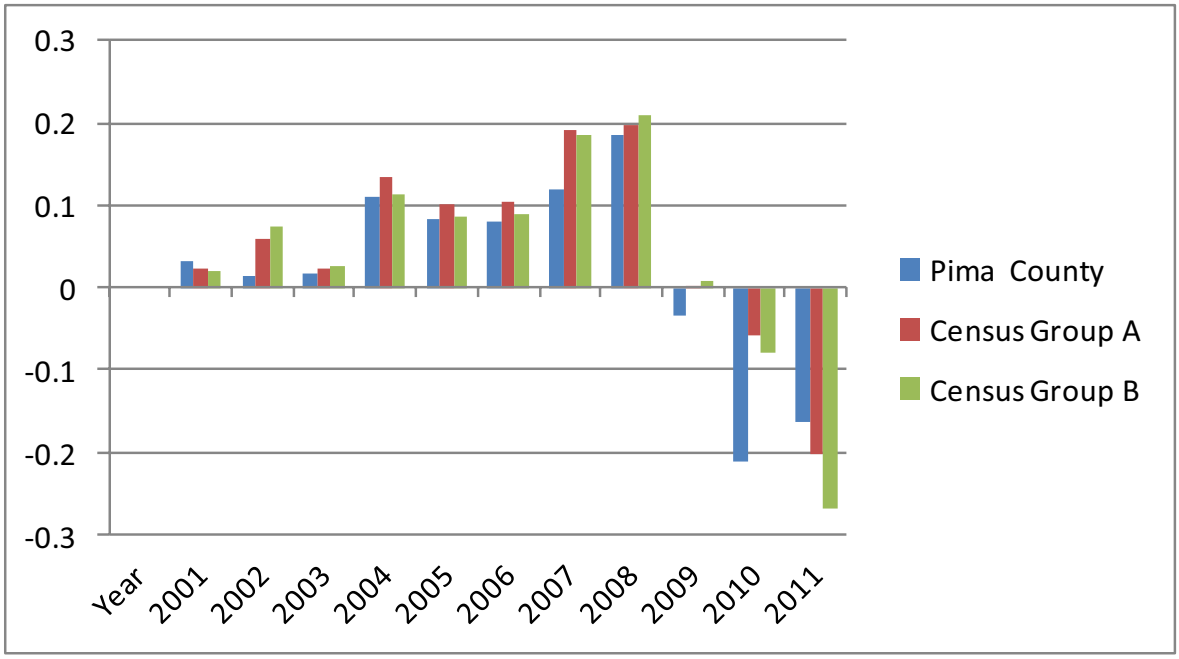
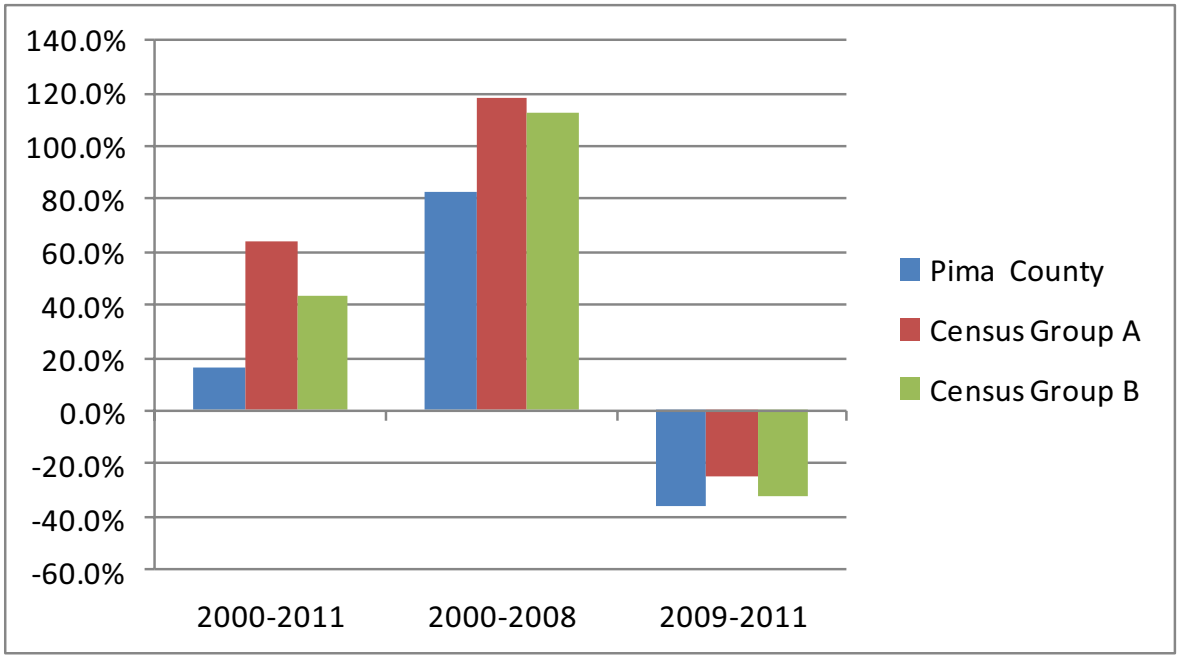
Figure 3-5. Percent Change in Average Property Values by Year (2000 – 2011)



Source: Calculated from data provided by Pima County GIS Department
Property value data are for single and multifamily residential. Census Group A includes Census Tracts 7, 19, 20, 21, 35.01 and 35.03. Census Group B includes Census Tracts 20, 21, and 35.01.

Figure 3-6 shows the changes in property values for the entire 2000 through 2011 time period and separately for 2000 through 2008 and 2009 through 2011. Even with the downturn in the 2009 to 2011 time period, property value data for the 2000 to 2011 time period show that for that 12-year period, property values for Pima County increased 16.4 percent. Conversely, property values in the two areas near the DMAFB 65 DNL noise contour areas increased much more (63.9 and 43.6 percent), as shown in Figure 3-6. This shows that for the 2000-2011 time period, a time when OSB was in operation in the region, property values in the areas around DMAFB increased substantially more than property values for the county as a whole.

Figure 3-6. Percent Change in Average Property Values for Select Time Period



Source: Calculated from data provided by Pima County GIS Department
Property value data are for single-family homes, duplexes, and large apartment complexes. Census Group A includes Census Tracts 7, 19, 20, 21, 35.01 and 35.03. Census Group B includes Census Tracts 20, 21, and 35.01.

3.3.3 Community Cohesion

Community cohesion is the unifying force of conditions that provide commonality within a group. It has also been used to describe patterns of social networking within a community. Community cohesion refers to the common vision and sense of belonging within a community that is created and sustained by the extensive development of individual relationships that are social, economic, cultural, and historical in nature. The degree to which these relationships are facilitated and made effective is contingent upon the spatial configuration of the community itself; the functionality of the community owes much to the physical landscape within which it is set. The viability of community cohesion is compromised to the extent to which these physical features are exposed to interference from outside sources.

The region within the impact footprint of the DMAFB noise contours appears to be relatively stable and cohesive. Approximately 73 percent of the single-family homes within the existing (No Action) impact footprint are in Census Tract 20. In Census Tract 20, 81 percent of the homes are owner-occupied, which is much higher than the 65 percent rate for Pima County and 53 percent for the City of Tucson. Approximately 59 percent have lived in their home since before 2000, compared to 34 percent for the county and 31.5 percent for the city.

Approximately 91 percent of the housing units in the census tract are occupied, slightly above the 88 percent for the county and 89 percent for the city, and a relatively large percentage of the residents (65 percent) are Hispanic.

There are no schools and only one church in the APZ or within 65-74 dBA contours. Ideal Missionary Baptist Church is within and would remain within the 70 dBA contour for DMAFB, even if there were no OSB flights.

3.3.4 Environmental Justice

3.3.4.1 Background

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by President Clinton on February 11, 1994. It was intended to ensure that proposed Federal actions will not have disproportionately high and adverse human health and environmental effects on minority and low-income populations and to ensure greater public participation by minority and low-income populations. It required each agency to develop an agency-wide environmental justice (EJ) strategy. A Presidential Transmittal Memorandum issued with the EO states that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321, et. seq." The DoD has directed that NEPA will be used to implement the provisions of the EO.

3.3.4.2 Demographic Analysis

EO 12898 does not provide guidelines as to how to determine concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the proposed actions at DMAFB. Most environmental impacts resulting from the action would be expected to occur within the City of Tucson, which, as the smallest governmental or geopolitical unity that encompasses the impact footprint for noise, is the Community of Comparison (COC).

The 2010 Census reports numbers of minority individuals, and the American Community Survey (ACS) provides the most recent poverty estimates available. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, Pacific Islander, or Other. Poverty status is used to define low-income. Poverty is

defined as the number of people with income below poverty level, which was $22,314 for a family of four in 2010, according to the U.S. Census Bureau.

The 2010 Census reports that the City of Tucson had a population of 520,116. Of this total, 274,793, or 52.8 percent were minority. ACS 5-year estimates (2006-2010) show that, of the 499,474 population for whom poverty status was determined, 106,162, or 21.3 percent, of the population was living below the poverty level. The Census Bureau defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level.

A potential disproportionate impact may occur when the percent minority in the study area exceeds 50 percent and/or the percent low-income exceeds 20 percent of the population. Additionally, a disproportionate impact may occur when the percent minority and/or low-income in the study area are meaningfully greater than those in the COC.

3.3.4.3 Environmental Justice and Conditions

The environmental justice analysis focused on the areas where there could be adverse environmental impacts, which are areas within the impact footprint. Demographic analysis showed that the COC, the City of Tucson, has a minority population of 52.8 percent (2010 Census) and a low-income population of 21.3 percent (ACS, 5-Year 2006-2010).

Census Tracts 20, 21, 35.01, and 35.03 (see Figure 3-3) underlie or are very near the 65 dB DNL noise contour and have minority population percentages greater than 50 percent and greater than the COC. Census Tract 7 has 50.4 percent minority, which is less than the COC (City of Tucson) minority percentage of 52.8 but still greater than 50 percent. Census Tracts 7, 20, 21, 35.01, and 35.03 have low-income populations greater than the COC's low-income population of 21.3 percent.

Review of the region using Google Earth/GIS confirmed that 826 single-family residences are present under the existing conditions (No Action) 65 dBA DNL footprint. Fifteen multifamily complexes are also located in this same area.

3.3.5 Executive Order 13045, Protection of Children

EO 13045 requires that each Federal Agency "identify and assess environmental health risks and safety risks that may disproportionately affect children," and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas.

3.4 Public Safety

3.4.1 Existing Conditions

The safety of the public with respect to aircraft operations at DMAFB is a primary concern for the Air Force. The areas surrounding DMAFB have AICUZ guidelines established to define those areas with the highest potential for aircraft accidents and aircraft noise impacts, and to establish flight rules and flight patterns that will have the least impacts on the civilian population of Tucson with regard to safety and noise effects. With regard to potential aircraft accidents, Accident Potential Zones (APZ) were established by the City of Tucson through the passage of ordinances regulating development in what is known as the Airport Environs Zone (AEZ). In 2004, the City of Tucson adopted ordinances to limit residential construction in potential APZs identified in a JLUS published by DMAFB, and Pima County did likewise in 2008.

The Air Force established the current active AICUZ with its corresponding APZs at DMAFB in 1992. OSB began operations in 1975. All aircraft participating in OSB follow established DMAFB flight rules and overhead patterns in accordance with the published AICUZ. The 1992 AICUZ study is now out of date, and considerable residential and commercial encroachment has occurred into the APZs originally established at DMAFB. A new AICUZ study was commissioned using 2007 flight data; however, the Final Draft AICUZ study release was postponed in 2009 because it did not include adequate analysis of land use under current noise zones.

The Air Force identifies categories of mishaps. Class A mishaps are those that result in a human fatality or permanent total disability, the destruction of an aircraft, or a total cost in excess of $1 million for injury, occupational illness, or destruction of an aircraft. Class B mishaps are those that result in a permanent partial disability, inpatient hospitalization of three

or more personnel, or a total cost in excess of $200,000 but less than $1 million for injury, occupational illness, or property damage. Class C mishaps are those that result in total damage in excess of $20,000 but less than $200,000; an injury resulting in a lost workday (i.e., duration of absence is at least eight hours beyond the day or shift during which the mishap occurred); or occupational illness that causes loss of time from work at any time.

In 1978, there was a crash (Class A mishap) of a DMAFB A-7 aircraft in the City of Tucson with civilian casualties. The aircraft was not a part of OSB operations, and the A-7 single-engine aircraft has since been replaced with the A-10. Since 1978, there has been no loss of any DMAFB aircraft in the Tucson area or on non-military land. OSB has never had a Class A mishap in its 35-year history. This is particularly impressive, considering the variety of ANG units and foreign units participating in OSB and the variety of aircraft types utilized. While aircraft participating in OSB have a flawless accident record, the particular aircraft types utilized all have an individual Class A mishap rate calculated based on worldwide deployment of that aircraft type. The mishap rates are based on the number of mishaps per 100,000 flying hours for each type of aircraft. For aircraft types participating in OSB training events, the Class A mishap rates were calculated using data provided by DMAFB, and those calculations are included by reference in this EA. The mishap rate is dependent on the number of each aircraft type deployed, the time elapsed since the aircraft type has been in operation, the number of hours flown for each type, and the location of the operations. The mishap rates for OSB at DMAFB were converted to a risk factor for each aircraft type based on the number of hours flown by each aircraft type in OSB. A summary of the cumulative risk factors for typical OSB aircraft from 2002 through 2010 is shown in Table 3-10.

Table 3-10. Risk Factors for OSB Aircraft

Year	Aircraft Type	Hours Flown	Risk Factor
2002	F-16	625.9	0.023
2003	F-16	1460.8	0.054
2004	F-16	1550	0.057
2005	F-16	1234.8	0.045
2006	F-16	877.5	0.032
2007	F-16	2685.9	0.099
2008	F-16	574	0.021
2009	F-16	1065.2	0.039
2010	F-16	1071.9	0.039
2002	A-10	805	0.017
2003	A-10	48.4	0.001
2004	A-10	158.4	0.003
2006	A-10	752.5	0.016
2007	A-10	486.8	0.010
2009	A-10	443.9	0.010
2002	HH-60	12.8	0.001
2007	HH-60	70	0.003
2008	HH-60	84	0.003
2009	HH-60	44.8	0.002
2002	F-15	424.3	0.010
2003	F-15	187.1	0.005
2008	F-15	84	0.003
2002	GR-4	417.9	0.009
2003	GR-4	595	0.013
2004	GR-4	792.7	0.018
2007	GR-4	158.5	0.004
2009	GR-4	240.3	0.005
2004	GR-7	146.1	0.009
2005	GR-7	352.9	0.023
2008	GR-7/9	158.6	0.010
2009	GR-7	107.5	0.007

Source: Wyle 2010; Note: GR-7/9 are similar to AV-8

SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Noise

In order to evaluate the range of alternatives under consideration, aircraft activity data contained in the 2007 Noise Study (ACC 2007) were used as a guide. It should be noted that the version utilized for comparison was the Final Draft version, and all comparisons made in this analysis assume no changes in noise modeling or resulting noise contours have occurred between the Final Draft and the Final Noise documentation. The Air Force Noise Model BASEOPS file and resulting noise contours in the 2007 Noise Study were created in Version 7.3. These data are the most recent data available for DMAFB.

Flying activities at DMAFB are described in the 2007 Noise Study documentation by unit, which include the 355 FW, 563 RQG, 943 RQG, 55 ECG, U.S. Customs and Border Protection (CBP), the Aerospace Maintenance and Regeneration Group (AMARG), OSB, and the 162 FW. In addition, some civilian and transient military aircraft are included in the 2007 Noise Study.

The following assumptions were used during the modeling:

- BASEOPS (version 7.352) was utilized to model noise exposure.
    - Confirmation that the noise contours from the BASEOPS file matched the published 2007 Noise Study was completed.
- No changes to maintenance run-ups, munitions noise, or airspace were evaluated.
- An assumption was made that F-16C and F-15A aircraft were suitable substitutes for additional aircraft associated with the OSB, as the useable electronic data available from the BASEOPS files were limited to F-16, F-15, A-10, GR-4, and C-130 aircraft.

In 1974, the Administrator of the USEPA, under authority of the Noise Control Act of 1972 recommended that all Federal agencies adopt the DNL noise metric system (AFH 1999). As mentioned previously, SEL noise from an F-16 can be as high as 104 dB at 500 feet above ground level, but those levels are highly variable and dependent upon climatic conditions, time of day, aircraft power, direction of noise source, etc. Consequently, a single event within a 65 dBA DNL contour can far exceed 65 dB and provide annoyance or a startled reaction; however, the average of the events (i.e., DNL) still represents the most accurate assessment of the conditions.

4.1.1 No Action Alternative

The No Action Alternative was evaluated based on the levels of aircraft sorties included in the 2007 Noise Study. Table 4-1 depicts the changes in levels of Average Busy Day (ABD) OSB flight activities between the 2007 Noise Study and the No Action Alternative, while Table 4-2 depicts all operations included in the No Action Alternative that are flown on an ABD. The Air Force uses ABD as any day on which flights are routinely conducted.

Table 4-1. 2009 ABD Operations and No Action Alternative

Wing/User	Aircraft Type	2007 Noise Study	No Action Alternative
OSB	A-10A	1.6	0.5
	F-15A	0.1	0.0
	F-16C	16.0	5.6
	Tornado (GR-4)	1.0	0.3

Table 4-2. ABD Operations at Davis-Monthan AFB (2009 Baseline)

Wing/User	Aircraft Type	Acoustic Day			Acoustic Night			Grand Total
		Arrival	Departure	Closed Pattern	Arrival	Departure	Closed Pattern	
Based Operators								
162 FW	F-16C	4.0	4.0		0.0	0.0	0.0	**8.0**
355 FW	A-10A	51.1	51.1	19.6	2.7	2.7	0.0	**127.2**
55 ECG	C-130H&N&P	1.7	2.3	14.4	1.1	0.6	0.0	**20.1**
563 RQG	C-130H&N&P	2.0	2.1	1.5	0.5	0.0	0.0	**6.1**
	UH60A	1.0	2.6	5.0	1.6	0.0	0.0	**10.2**
943 RQG	UH60A	0.4	1.4	2.5	1.1	0.0	0.0	**5.3**
CBP	ASTAR SA350D	8.2	8.2	0.2	3.8	3.8	0.0	**24.1**
	CESSNA-441 TPROP	0.2	0.2	0.1	0.0	0.0	0.0	**0.5**
	CESSNA-500	2.0	2.0	0.1	0.0	0.0	0.0	**4.1**
	UH60A	5.4	3.7		1.9	1.8	0.0	**12.8**
		75.9	**77.5**	**43.4**	**12.7**	**8.9**	**0.0**	**218.4**
Civilian								
	CESSNA441 TPROP	5.0	5.0	0.0	0.0	0.0	0.0	**10.0**
	COMPOS BUS JET	5.0	5.0	0.0	0.0	0.0	0.0	**10.0**
		10.0	**10.0**	**0.0**	**0.0**	**0.0**	**0.0**	**19.9**
Transient								
AMARG	A-10A	0.1	0.1	0.0	0.0	0.0	0.0	**0.3**
	C-130H&N&P	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	F-16C	0.1	0.1	0.0	0.0	0.0	0.0	**0.1**
	F-4C	0.3	0.3	0.9		0.0	0.0	**1.5**
	P-3A	0.1	0.1	0.2	0.0	0.0	0.0	**0.5**
CBP	UH60A		1.7	0.0	0.0	0.0	0.0	**1.7**

Table 4-2, continued

Wing/User	Aircraft Type	Acoustic Day			Acoustic Night			Grand Total
		Arrival	Departure	Closed Pattern	Arrival	Departure	Closed Pattern	
Snowbird	A-10A	0.3	0.3	0.0	0.0	0.0	0.0	**0.5**
	F-15A	0.0	0.0	0.0	0.0	0.0	0.0	**0.05**
	F-16C	2.8	2.8	0.0	0.0	0.0	0.0	**5.6**
	TORNADO	0.2	0.2	0.0	0.0	0.0	0.0	**0.3**
Transient	C-130E	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	C-5A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	E-3A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	F-16A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	F-18A/C	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	KC-10A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	KC-135R	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	P-3A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
	T-38A	0.6	0.6	0.0	0.0	0.0	0.0	**1.2**
		9.1	**10.8**	**1.1**	**0.0**	**0.0**	**0.0**	**21.0**

Note: Although the total number of arrivals (88.6) and departures (86.4) do not equal, this small discrepancy in the data collection and rounding errors is so minor that there would be no effect on the overall results.

4.1.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

Alternative 1 would increase OSB flight activities to 1,920 training sorties per year. Additionally, 240 arrival and departure operations by OSB aircraft and 96 supporting cargo sorties (modeled as C-130 aircraft) would participate under Alternative 1, bringing the total sorties under Alternative 1 to 2,256 per year. Table 4-3 depicts the level of ABD OSB sorties under Alternative 1.

Table 4-3. ABD OSB Operations Under Alternative 1

Aircraft Type	Preferred Alternative
A-10A	0.4
F-15A	0.04
F-16C	4.5
Other Foreign Aircraft (Modeled as F-16C)	0.3
OSB Support F-16C	0.7
C-130 Cargo OSB Support	0.3

Figure 4-1 depicts the resulting noise exposure contours from the Alternative 1. In this figure, the No Action Alternative is depicted with a red outline, while the Alternative 1 contour is depicted in yellow.

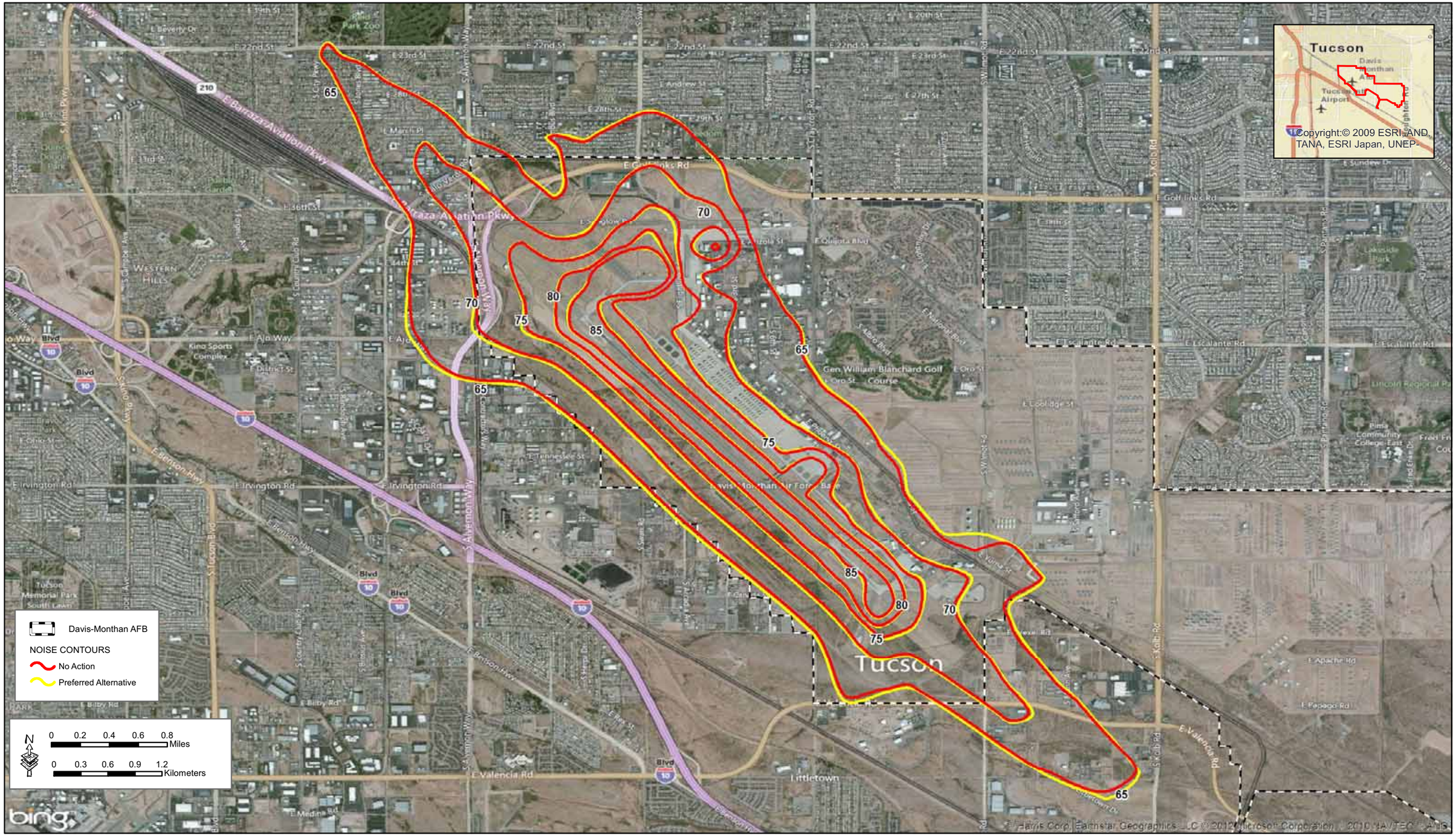


Figure 4-1. Preferred Alternative Noise Contours at Davis-Monthan AFB

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June 2012

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As can be seen from this figure, the 65 dBA DNL contour would be increased slightly, primarily near the south and southeastern areas of DMAFB. However, some additional residences northwest of the base would be affected as a result of implementation of the Proposed Action. Table 4-4 identifies the number of off-base sensitive noise receptors and acreage that would be affected by the No Action Alternative and the three action alternatives. Approximately 17 residences and 17 acres of land (currently used for residential purposes) would be affected by the slight expansion (35-50 feet) of the 65 dBA DNL contour northwest of the base. In addition, approximately 1 acre and three residences, which are currently in the 65 -69 DNL contour, would be within the 70 – 74 dBA DNL contour under the Proposed Action. It should be emphasized, however, that this shift in contours is less than 50 feet in most cases and the increase in noise would likely be imperceptible.

Table 4-4. Number of Off-base Sensitive Noise Receptors and Acreage Affected by the No Action Alternative and the Three Action Alternatives

	Noise Contour (DNL) Baseline	Single-Family Residences	Multifamily Residences	Other Buildings	Acres
No Action	65-69 dB	811	134	14	970
	70-75 dB	15	4	0	114
Alternative 1	65-69 dB	828	134	14	1,033
	70-75 dB	18	4	0	128
Alternative 2	65-69 dB	828	134	14	1,021
	70-75 dB	18	4	0	125
Alternative 3	65-69 dB	828	134	14	1,021
	70-75 dB	18	4	0	125

4.1.3 Alternative 2. Continuation of OSB at 2002 Levels

Under Alternative 2, OSB activities would involve an annual total of 1,979 OSB sorties. The range of aircraft proposed for use would include F-16, F-15, FA-18, AV-8, KC-135, C-17, C-5, C-141, and various helicopters, all represented in the noise model with the F-16C and F-15A aircraft. Table 4-5 identifies the level of ABD OSB sorties under Alternatives 2 and 3, since they would be the same. These data do not include the OSB cargo and support sorties; however, the cargo and support sorties would be expected to be at similar, but reduced, levels as that described under Alternative 1.

Table 4-5. ABD OSB Sorties Under Alternatives 2 and 3

Wing/User	Aircraft Type	Alternatives 2 & 3
	A-10A	0.5
	F-15A	0.04
Snowbird	F-16C	4.6
	Other Foreign Aircraft (Modeled as F-16C)	0.3

Figure 4-2 depicts the resulting noise exposure contours from Alternative 2. In this figure, the No Action Alternative is depicted with a red outline, while the Alternative 2 noise exposure contours are depicted in blue.

As in the case under Alternative 1, the 65-dBA DNL would be increased primarily in the southeastern and southern portion of the base and very slightly (<50 feet) in areas to the northwest of DMAFB. No additional noise receptors would be affected beyond that described for the Alternative 1.

4.1.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

This alternative would involve the same level of sorties (1,979) and aircraft described for Alternative 2, but would include additional international aircraft such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale. Table 4-5 also presents the level of OSB ABD sorties under Alternative 3. The noise contour presented for Alternative 2 in Figure 4-2 would be the same under Alternative 3. This slight increase would affect the same number of residences in both the 65 and 70 DNL contours as described for the Alternative 1.

4.2 Air Quality

4.2.1 Environmental Consequences

4.2.1.1 No Action Alternative

The No Action Alternative would not result in any direct impacts on air quality because there would be no increase in aircraft sorties compared to the number of sorties occurring from FY 2009. Under the No Action Alternative, the number of sorties (1,190) would be similar to those of previous years.

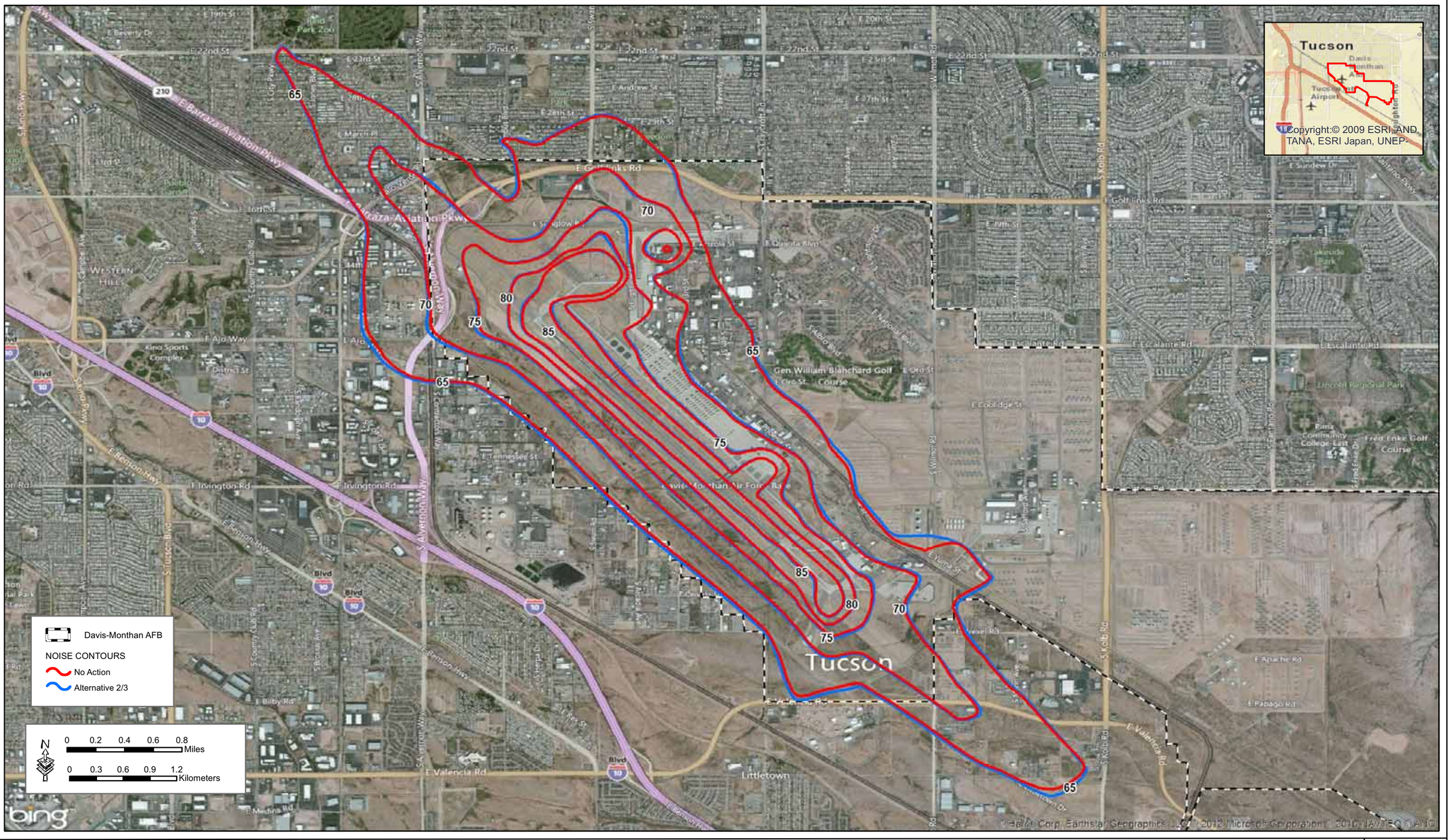

Figure 4-2. Alternative 2/3 Noise Contours at Davis-Monthan AFB

GSRC

June 2012

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4.2.1.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

Alternative 1 would increase aircraft sorties from 1,190 to 2,256 per year, an increase of 1,066 sorties annually. Under Alternative 1, over 15 different foreign and domestically manufactured aircraft could be used during training exercises. The frequency of use or the anticipated number of sorties from one airframe to another is difficult to predict. Therefore, this analysis uses a worst case scenario and analyzes the aircraft that have the greatest operational emissions in their class. The F-16 Fighting Falcon jet and the Sikorski Super Stallion helicopter have the highest fuel consumption in their class and they were used in this analysis. Approximately 84 percent of the training activities involve jets and 16 percent are helicopters.

Air emissions from the aircraft were calculated using the Federal Aviation Administration's (FAA) Emission and Dispersion Modeling System (EDMS) 5.1 air quality model, for the projected number of takeoff and landings. The EDMS 5.1 model was used to estimate the emissions of 895 jet (F-16) sorties and 171 helicopter (Super Stallion) sorties at DMAFB. A number of other emission sources are associated with the operations of military jets and helicopters, such as aircraft tractors, fuel trucks, and ground poser units. Emissions from these sources are considered in the following calculations, which are summarized in Table 4-6 and presented in detail in Appendix B.

Table 4-6. Annual Air Emissions (Tons) Produced by Additional OSB Aircraft Under Alternative 1 (Preferred Alternative)

Pollutant	Total	*de minimis* Thresholds[1]
CO	41.00	100
VOCs	6.50	100
NO_x	6.45	100
PM-10	0.20	100
PM-2.5	0.19	100
SO_2	0.84	100
CO_2E	1,514.80	NA

Source: 40 CFR 51.853 and GSRC model projections.
[1]Note that Pima County is in non-attainment for PM-10 and a maintenance area for carbon monoxide.

Air emissions in Pima County are expected to increase due to the implementation of training activities associated with Alternative 1. The OSB airfield activities are estimated to increase air emissions of CO up to 41.00 tons per year and up to 0.20 ton of PM-10 per year. Overall, the

net increases in CO and PM-10 air emissions would be minor and well below the *de minimis* threshold; therefore, the direct and indirect impacts on air quality would be negligible.

4.2.1.3 Alternative 2. Continuation of OSB at 2002 Levels

Alternative 2 would increase sorties from 1,190 to 1,979 per year, an increase of 789 sorties annually. Several types of aircraft could be used during training exercises. This analysis uses the same maximum level of proposed activity and analyzes the same surrogate aircraft (F-16 and Sikorski) and flight percentage used for Alternative 1. The EDMS 5.1 model was used to estimate the emissions of 663 jet (F-16) sorties and 126 helicopter (Super Stallion) sorties at DMAFB. A number of other emission sources are associated with the operations of military jets and helicopters such as aircraft tractors, fuel trucks, and ground poser units. Emissions from these sources are considered in the following results, which are summarized in Table 4-7 and presented in detail in Appendix B.

Table 4-7. Annual Air Emissions (tons/year) Produced by Additional OSB Aircraft Under Alternative 2

Pollutant	Total	*De minimis* Thresholds[1]
CO	28.72	100
VOCs	4.74	100
NO_x	4.62	100
PM-10	0.14	100
PM-2.5	0.14	100
SO_2	0.55	100
CO_2E	1,121.41	NA

Source: 40 CFR 51.853 and GSRC model projections.
[1]Note that Pima County is in non-attainment for PM-10 and a maintenance area for carbon monoxide.

Air emissions in Pima County are expected to increase due to the implementation of training activities associated with Alternative 2. The new airfield operations are estimated to increase air emissions of CO up to 28.72 tons per year and PM-10 up to 0.14 ton per year. Overall, the net increases in CO and PM-10 air emissions would be minor and well below the *de minimis* threshold; therefore, the direct and indirect impacts on air quality would be negligible.

4.2.1.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

Alternative 3 would increase sorties from 1,190 to 1,979 per year, an increase of 789 sorties annually. Air emissions associated with the implementation of Alternative 3 would be similar to

those described in Alternative 2 and, therefore, the direct and indirect impacts on air quality would be negligible.

4.3 Socioeconomics and Environmental Justice

4.3.1 Socioeconomics

4.3.1.1 No Action Alternative

The No Action Alternative is based on OSB activities at or below the 2009 levels. With no additional activity, no impacts on population, housing, education, income, or employment would be anticipated.

4.3.1.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

The Proposed Action would increase the total number of OSB sorties to 2,256 per year. There would be a slight increase in the 65-69 dBA DNL contour, adding 17 residences to the impact area, and in the 70-74 dBA DNL contour, adding three residences to the impact area. The Proposed Action also would not cause increased safety risks and would not lead to physical displacement of people, so socioeconomic impacts would be negligible.

The Proposed Action could provide benefits to the region. The Proposed Action would increase the number of people coming to DMAFB for training. These additional trainees would eat at area restaurants, rent automobiles, and in some cases may stay in area hotels. These activities would provide revenues to area businesses over and above what would occur without the added activity.

Concerns about the impacts of an expansion of OSB activity on the tourism industry were expressed by citizens at public meetings and in written comments. Anecdotal information presented cites noise as causing an adverse impact on tourism-industry businesses. However, any adverse impacts on tourism in the region would be the result of all DMAFB-related activity, not just OSB, and they would be difficult to quantify. The Proposed Action makes only minor changes in the number of homes and businesses within the 65 dBA noise contour, and most of the business areas are light industrial. Consequently, the Proposed Action would have negligible adverse impacts on tourism.

There are also some positive tourism-related impacts related to DMAFB and the Air Force in general. The Pima Air and Space Museum, located on the southwest side of DMAFB, is the third largest aviation museum in the world and the largest non-government funded aviation museum. More than 150,000 visitors annually pay to visit the museum to view and learn the history of the more than 300 aircraft and space craft housed there.

4.3.1.3 Alternative 2. Continuation of OSB at 2002 Levels

Under Alternative 2, the noise contours would be similar to those in the Alternative 1. Adverse socioeconomic impacts would be negligible, and the added activity could lead to revenue benefits for area businesses.

4.3.1.4 *Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level*

Under Alternative 3, noise contours would impact the same structures as under the Proposed Action and Alternative 2, and negligible adverse impacts would be expected. As with the Proposed Action and Alternative 2, some area businesses could realize benefits in the form of increased revenues.

4.3.2 Property Values

Property values for single and multifamily residential properties in Pima County and two smaller areas around the DMAFB flight path were analyzed to determine changes over the last 10 years. OSB operated throughout this time period. The data show that property values generally increased from 2000 through 2008, then decreased noticeably in 2010 and 2011, following trends across the nation as a result of the recession (see Tables 3-2 and 3-3).

4.3.2.1 No Action Alternative

Over the last decade, property values in Pima County and the two areas immediately around the DMAFB flight path have followed national trends, increasing through 2008, followed by substantial decreases (see Tables 3-2 and 3-3). Overall, from 2000 through 2011, property values in the two areas around DMAFB increased substantially more than the county as a whole, growing 63.9 and 43.6 percent, compared to property value growth of only 16.4 percent for Pima County. The No Action Alternative would not be expected to impact property values in the region.

4.3.2.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

The Proposed Action would not be expected to impact property values in the region, since the data presented in Section 3.3.2 indicate that neither OSB nor DMAFB activities have had an apparent adverse effect on the property values. The national and regional economy would continue to drive property values in the area around DMAFB and the region.

4.3.2.3 Alternative 2. Continuation of OSB at 2002 Levels

Under Alternative 2, no impacts on property values would be expected.

4.3.2.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

No impact on property values would be expected.

4.3.3 Community Cohesion

4.3.3.1 No Action Alternative

The No Action Alternative is not expected to change the physical structure of the community around DMAFB, so community cohesion would not be impacted.

4.3.3.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

No physical displacement of people or closure of community facilities (e.g., schools, recreation centers, churches) would be expected under the Alternative 1. As a result, the Proposed Action would not be expected to impact community cohesion.

4.3.3.3 Alternative 2. Continuation of OSB at 2002 Levels

As with the Proposed Action, Alternative 2 would not require relocation or closure of community facilities, so no impacts on community cohesion would be expected.

4.3.3.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

Alternative 3, like Alternative 2 and the Proposed Action, would have no impact on the physical structure of the community.

4.3.4 Environmental Justice

The EJ analysis focuses on areas where there could be adverse environmental impacts. The *Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP) (*U.S. Air Force November 1997) outlines specific guidelines with respect to EJ. The following paragraphs detail the data and calculations used for this EJ analysis.

The resource being addressed in this analysis is noise. Noise contours for the proposed OSB training activities were generated from the 2007 Noise Study. The noise contours were placed over aerial photographs to determine the affected residential areas. Census tracts clearly touched by the 65 dB DNL noise contour include census tracts 20, 21, and 35.01 (see Figure 3-3); however, the portion of Census Tract 21 under the 65 dBA impact footprint does not contain residences. A small section of Census Tract 19 appears to be within the 65 dB DNL noise contour, but that small section is part of the Randolph Golf Course and/or the Reid Park Zoo and has no residential structures. Other census tracts that are very close to the noise contour include Census Tracts 7 and 35.03.

To determine if there may be disproportionately high and adverse environmental impacts on minority or low-income populations as a result of the Alternatives, the EJ guidelines specify that data for the impacted area should be compared with data from a COC. The COC is defined as the smallest political unit that encompasses the impact footprint, which, as mentioned previously, is the City of Tucson.

To assess EJ, the percent minority population in the impacted census tracts was compared to the percent minority in the COC. Similarly, the percent low-income population in the impacted census tracts was compared to the percent low-income in the COC. Low-income populations are defined as those living below the poverty level.

The 2010 Census data were used to determine the percent of the population that is minority. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, or Pacific Islander.

The U.S. Census Bureau no longer provides social characteristics of the population (including those living below the poverty level) in the decennial census. The Census Bureau's ACS,

however, provides these estimates for many levels of geography. ACS provides 1-year, 3-year, and 5-year estimates.

The data used in this analysis are the 5-year ACS estimates (2006-2010) for poverty, as they are the most recent estimates available. The U.S. Census Bureau defines the poverty level in 2010 as $22,314 for a family of four (note that this is slightly different from the poverty definition used by the Department of Health and Human Services). ACS provides estimates of the population for whom poverty status is determined by total, number below poverty level, and percent below poverty level.

Demographic analysis showed that the COC has a minority population of 52.8 percent (U.S. Census Bureau 2010) and a low-income population of 21.3 percent (ACS, 5-Year Estimates, 2006-2010). Minority and low-income percentages in the affected census tracts are shown in Table 4-8. Table 4-8 also indicates whether or not each census tract is considered to be disproportionately impacted. To determine if the affected census tracts have disproportionately high minority or low-income populations, the percentage of each of these groups was compared to the corresponding percentage for the COC. If the percentage for the census tract is greater than the percentage for the COC or greater than 50 percent, it is considered to have a disproportionate impact on minority and/or low-income populations.

Table 4-8. Census Tracts in City of Tucson – Environmental Justice Summary Data

Geographic Unit	Percent Minority	Disproportionate	Percent Low-Income	Disproportionate
U.S.	36.3		13.8	
Arizona	42.2		15.3	
Pima County	44.7		16.4	
City of Tucson	**52.8**		**21.3**	
Census Tracts				
7	50.4	Yes	23.9	Yes
19	25.4	No	12.3	No
20	72.5	Yes	23.2	Yes
21	89.2	Yes	28.6	Yes
35.01	67.4	Yes	34.5	Yes
35.03	61.6	Yes	33.2	Yes

Sources: U.S. Census Bureau, 2010 Census and American Community Survey, 5-Year Estimates, 2006-2010

Data presented in Table 4-8 show a disproportionate impact on populations living in all but one of these census tracts.

4.3.4.1 No Action Alternative

Under the No Action Alternative, much of the area would continue to be exposed to noise levels of 65 dBA DNL or greater because current mission support activities, including DMAFB and transient military aircraft operations, would continue whether or not the Proposed Action or other alternatives are implemented. An estimated 811 single-family residences and 134 multifamily complexes are within the existing (No Action) 65-69 dBA noise contour, and 15 single-family residences and four multifamily complexes are within the 70-74 dBA noise contour. Approximately 5,000 notices were mailed directly to residents located northwest of the base to provide notification of the public scoping meetings. Similar notices were sent confirming the availability of the Draft EA, in an attempt to provide meaningful involvement of the low-income and minority populations.

4.3.4.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

Under the Alternative 1, the number of sorties would increase, but the 65-69 and 70-74 dBA noise contours remain essentially the same, impacting only 17 and three additional homes, respectively. There would continue to be an impact on the minority and low-income populations in the residential areas on the northwest side of DMAFB; however, There would be no additional disproportionately high and adverse impacts on minority and low-income populations near DMAFB compared to those impacts associated with No Action alternative. Special efforts were made to notify minority and low-income populations which are already affected by OSB operations and involve them in reviewing this EA. As discussed in Section 4.1, aircraft noise contours were developed for the No Action Alternative, and Alternatives 1, 2 and 3. Aircraft noise-related impacts are associated with areas within the 65 dBA DNL contour. Noise impacts associated with the Proposed Action and Alternatives 2 and 3 would be in the area where the expanded noise contour for the alternative covers a larger area than the contour for the No Action Alternative. Consequently, noise impacts relative to EJ issues would be negligible.

4.3.4.3 Alternative 2. Continuation of OSB at 2002 Levels

The 65-69 and 70-74 dBA DNL contours for Alternative 2 include the same number of residences as the Alternative 1, and any impacts would be negligible.

4.3.4.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

The 65-69 and 70-74 dBA DNL contours for Alternative 3 are the same as for Alternative 2. No additional impacts would be expected.

4.3.5 Public Safety

This section evaluates the various alternatives to determine their potential to affect aircraft operations relative to public safety. Changes in the aircraft inventory under the Proposed Action would alter the number of sorties within DMAFB's airfield environment. As such, the potential effects on risks to military personnel, the public, and property are examined. Fire and ground safety are assessed for OSB operations, as part of the DMAFB standard safety practices, for the potential to increase risk, as well as the Air Force's capability to manage that risk by limiting exposure, responding to emergencies, and fire management and suppression both at the base and at the ranges. Analysis of aircraft flight risks correlates projected Class A mishaps and Bird/Wildlife-Aircraft Strike Hazard (BASH) with current use of the runways and airspace to consider the magnitude of the change in risk associated with the proposed OSB operations. Changes to the use of munitions are also compared to current conditions, where applicable.

As the number of flight hours increases for OSB aircraft operating from DMAFB, so the risk factors for each aircraft type will also increase incrementally. Because OSB flight operations make up only a small portion of the total DMAFB flight operations (7 percent), the increase in sorties analyzed in this EA for any of the action alternatives would have a minimal effect on the overall risk factors for DMAFB aircraft types (USAF 2009).

Health and safety risks due to the potential for aircraft mishaps are reduced at DMAFB through the following safety practices:

1. Airfield departures and arrivals, to the maximum extent possible and consistent with established safety procedures, use the airspace southeast of the base.
2. Traffic patterns are flown to minimize overflights of populated areas.
3. Operational areas for aircraft are over very sparsely populated areas.

OSB operations also implement the following flight safety measures:

1. All aircraft carrying live ordnance utilize the southeast corridor.
2. Aircraft unable to expend live ordnance due to any system malfunction are diverted to an alternate base to preclude recovery over the Tucson metro area.
3. Aircraft experiencing malfunctions recover to DMAFB from the southeast, preventing overflight of densely populated areas.

Participation by foreign nations would involve international aircraft as described earlier, but the small numbers of those aircraft would not appreciably increase the overall risk factor for OSB operations. All foreign units that are allowed to train within the United States are vetted through an intense approval process; approval for their training mission is at the Secretary of the Air Force level (Carpenter 2011). It should also be noted that all U.S. and foreign units that train under the OSB mission are experienced pilots; they are not learning how to fly. Rather, they are training to operate under different warfare scenarios.

4.3.5.1 No Action Alternative

The No Action Alternative would involve OSB training activities at the 2009 sortie level of approximately 1,190 sorties annually. All safety practices identified above are currently in effect, and, as a result, there have been no Class A mishaps in the history of OSB. There would be no increased safety risk for the Tucson area, since OSB sorties would be kept at the current level.

4.3.5.2 Alternative 1. Implementation of the Updated NGB TP 60-1 (Preferred Alternative)

The Proposed Action would increase year-round OSB sorties to include approximately 1,920 training sorties and up to 240 participating aircraft arrival and departure sorties and 96 cargo sorties to support OSB operations. This would slightly increase the potential risk factor for most OSB aircraft due to the increased flight hours involved. The primary aircraft involved in OSB operations (60 percent) are the F-16 and the A-10, and the increased training sorties would involve primarily those aircraft types. The Proposed Action would not appreciably increase the risk factor for current OSB operations. All safety practices identified in Section 4.3.5 above are currently in effect and would not change under Alternative 1. The risk factors for individual OSB aircraft types for 2009 can be found in Table 3-10, presented previously.

4.3.5.3 Alternative 2. Continuation of OSB at 2002 Levels

Implementation of Alternative 2 would result in a decrease in the number of OSB aircraft and sorties flown, and the risk factors for aircraft types would be reduced accordingly. The 12 percent reduction in OSB sorties would result in a very minor risk factor reduction due to the elimination of foreign aircraft types from OSB.

4.3.5.4 Alternative 3. Additional Types of U.S. and Foreign Aircraft at 2002 CSAR Level

This alternative would not result in risk factors substantially different from those of Alternative 2, since the number of sorties would remain the same, but with additional aircraft types participating.

SECTION 5.0
CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

5.0 CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

This section of the EA addresses the potential cumulative impacts associated with the implementation of the alternatives and other projects/programs that are planned for the region. The CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). This section continues, "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

USEPA suggests that analysis of cumulative impacts should focus on specific resources and ecological components that can be affected by the incremental effects of the proposed actions and other actions in the same geographic area. This can be determined by considering:

- Whether the resource is especially vulnerable to incremental effects;
- Whether the proposed action is one of several similar actions in the same geographic area;
- Whether other activities in the area have similar effects on the resource;
- Whether these effects have been historically significant for this resource; and
- Whether other analyses in the area have identified cumulative effects.

Additionally, the analysis should consider whether geographic and time boundaries large enough to include all potentially significant effects on the resources of concern have been identified. Geographic boundaries should be delineated and include natural ecological boundaries and the time period of the project's effects. The adequacy of the cumulative impact analysis depends upon how well the analysis considers impacts that are due to past, present, and reasonably foreseeable actions. This can be best evaluated by considering whether the environment has been degraded (to what extent); whether ongoing activities in the area are causing impacts; and the trend for activities and impacts in the area. The ROI for cumulative impacts analysis includes DMAFB, the restricted airspace surrounding the base, and the City of Tucson. Specific projects that have occurred, those currently taking place, and those projected for the future are identified in subsequent subsections.

As an active military installation, DMAFB experiences changes in mission and training requirements in response to defense policies, current threats, and tactical and technological advances. As a result, the base requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs on an ongoing basis. Although such known construction and upgrades are a part of the analysis contained in this EA, some future requirements cannot be predicted. As those requirements surface, future NEPA analysis will be conducted, as necessary.

5.1 Past and Present Activities at or near Davis-Monthan AFB

5.1.1 Military Projects

Numerous changes have recently occurred or are being planned in around DMAFB. Other recent or ongoing actions at DMAFB proper are summarized below. Other military actions surrounding DMAFB that could contribute to the cumulative impacts are discussed in the subsequent paragraphs.

- Beddown of the F-35A aircraft at Luke AFB in Phoenix and TIA (in addition to Holloman AFB and Boise Air Guard Station) is currently being assessed in an Environmental Impact Statement (EIS). The Final EIS has been released and is currently out for public review. The proposal evaluates replacement of F-16 aircraft with F-35A and providing the required formal training support to support the F-35A aircrew force. The net change in the number of aircraft would be two and 12, if the action were to be located at Luke AFB and TIA, respectively (ACC 2012).
- Several Capital Improvement Projects (CIP) are being considered at DMAFB; these projects include military construction of housing, recreation, and administration facilities. All projects would be constructed within previously disturbed areas.
- The 162 FW plans to construct and demolish facilities to improve current base layout, relocate an entry gate, relocate a munitions storage area, new facilities and renovation, and a holding apron. This project includes acquisition of 22.7-acre, 5.4-acre, and 7.4-acre parcels for redevelopment plans, and will disturb about 7 acres from short- to long-range time frame.
- The United Arab Emirates (UAE) left Tucson AGS in December 2010 with 13 Block 60 F-16 aircraft. UAE had trained with the 162 FW since June 2004. However, the Royal Netherlands Air Force has announced that it will train with the 162 FW at TIA and will bring 12 F-16s. The total program will provide 3,000 flying hours per year. The transition from the UAE to Dutch training programs offset each other.
- The 2002 CSAR included the beddown of three squadrons composed of HH-60 helicopters, HC-130 fixed-wing aircraft, and Combat-Rescue officers, to conduct combat search and rescue training. Training is conducted in Sells Low MOA, Jackal Low MOA, BMGR East, Yuma Tactical Navigation areas, and overwater training areas. The Environmental Assessment included evaluation of OSB.

- The F-16 Block 25 aircraft currently assigned to 162 FW are coming to the end of their operational lifespan. ANG proposes to replace the Block 25 aircraft with Block 32 aircraft in a one-for-one exchange. The F-16 Block 32 aircraft would operate at TIA and in the airspace in the same manner that the F-16 Block 25 aircraft do currently.
- Luke AFB prepared an EIS to address several range projects that add new target area for air-to-ground missiles, mobile vehicle targets, reconfiguration of existing range for helicopter training, new sensor training area, improvements of ground training exercises, infrastructure and road improvements, lowering of operational airspace floor to 500 feet AGL over Cabeza Prieta NWR, and a new taxiway and air traffic control tower at Gila Bend AFAF.
- Angel Thunder is a joint-services exercise conducted at DMAFB. It generally occurs every 18 months and focuses on search and rescue training missions. This exercise has included use of the same airspace that OSB and DMAFB typically use, including the BMGR. The exercise also involves ground ranges at BMGR. A variety of aircraft, including helicopters, may use restricted and military airspace during such an exercise. These areas and activities would overlap with areas identified for OSB training for the Proposed Action at DMAFB. However, the timing would likely not overlap, to avoid conflicts with available airspace.

In addition to these training missions and military construction projects, the 355 FW manages and supports flight operations at DMAFB that include daily training sorties. A-10 pilots are trained in providing close air support, forward air control, and combat search and rescue. Some of these activities require pilots to perform touch and go's and other pattern flying operations at and within the airspace surrounding DMAFB. Other Air Force units, such as the 563 RD Rescue Group and 55th Electronic Combat Group, also use DMAFB runways and airspace on a daily basis. As indicated previously, DMAFB flight operations, exclusive of OSB aircraft, total about 218 on an average busy day.

5.1.2 Other Federal, State, and Local Actions Surrounding DMAFB

Other past, current, and future Federal actions in the area could also contribute to cumulative effects of the Alternatives. Federal agencies with jurisdiction within the ROI include the FAA, Federal Highway Administration (FHWA), and CBP. Potential actions within the area and occurring in the same time frame or in the same general area of DMAFB were identified and considered in preparation of this Draft EA. CBP recently constructed a U.S. Border Patrol (USBP) station and sector headquarters adjacent to DMAFB, at the intersection of Golf Links Road and Swan Road. In addition, CBP recently constructed an evidentiary vault in the northwestern part of the base, near the east side of the runway. CBP and USBP routinely use DMAFB runways and airspace for patrol and evidentiary transport missions. The FHWA, in cooperation with the Arizona Department of Transportation (ADOT) recently completed major

improvements to Interstate 10. The FAA and TIA recently completed improvements to the runways at TIA; 162 FW aircraft operated out of DMAFB during the construction activities.

5.1.3 Non-Federal Actions Near DMAFB

Non-federal actions include State of Arizona, county, and private projects. General ongoing state activities include oil, gas, and grazing leases on state trust lands, land exchanges, road projects, and improvements to state parks and monuments. The primary actions that have recently occurred, or that are being planned, include surface road improvements.

5.2 Cumulative Effects Analysis

Other military actions in the region overlap in space or time with the Proposed Action, particularly within the airspace above the BMGR; however, these overlaps have historically been handled through intense, coordinated scheduling. This scheduling has not resulted in cumulative impacts. There is potential interaction with some ongoing and recent projects, described above, to have the potential to either increase or offset possible environmental consequences. The following sections describe what these potential outcomes may be.

5.2.1 Noise

Several actions have taken place at DMAFB over the last decade that have increased or decreased operations and changed aircraft type, number of operations, and support staff. As a result, noise levels at the airfield and surrounding areas have also varied. DMAFB has historically experienced noise levels much higher than would be expected under the Proposed Action. The addition of 1,066 annual sorties by OSB aircraft under the Proposed Action (i.e., 2,256 annual sorties) would represent a 90 percent increase over the No Action Alternative (i.e., 1,190 annual sorties), but would still represent only 7 percent of the total DMAFB sorties. In addition, as noted in Section 4.1.2, the 65 dBA DNL noise contour would be expanded primarily in the areas southeast of DMAFB where there are no sensitive noise receptors. Slight expansions would occur northwest of the base and would affect up to 17 additional residences.

Cumulative effects on the noise contours surrounding DMAFB and TIA could occur if the F-35A beddown occurs at TIA. Under the scenario of the TIA Beddown alternative, approximately 8,500 people would be exposed to noise levels greater than 65 dBA DNL who are currently not exposed to noise at these levels. This number includes approximately 717 people who would be exposed to noise levels in the 70-74 dBA range. As such, these increases would likely

constitute a major cumulative impact. It should be noted, however, that the TIA is only one of several locations being considered for the F-35 Beddown and it is not the preferred alternative.

Most other actions at or surrounding DMAFB may produce localized noise increases, primarily from ground activities (such as weapons firing ranges, field training exercises, or MILCON projects), so cumulative noise impacts would be localized and primarily on Federally owned land. The cumulative impacts identified for airspace, ranges, noise, or safety would not be significant, but will likely require more coordination between Albuquerque Air Route Traffic Control Center, the FAA Central Service Region, and military airspace managers.

5.2.2 Air Quality

The potential cumulative air quality impacts would result from operations occurring below 3,000 feet AGL during takeoff and landings. Emissions created by aircraft training activities were addressed in Section 4.2 and, as noted, would be well below *de minimis* threshold levels. Pima County is considered in moderate non-attainment for PM-10 and in maintenance for CO. The Proposed Action would not be expected to contribute to cumulative effects of PM-10 since there would be no additional ground disturbances. Other Federal and non-Federal construction projects could contribute to cumulative increases in PM-10; the magnitude of these effects would depend on climatic conditions, size of the areas disturbed, timing and location of the construction in relation to other projects, and implementation of best management practices, such as watering to control fugitive dust, revegetation of disturbed sites, and use of pavement or soil binders on unimproved roads and parking lots. OSB training missions would contribute to increase in CO emissions; however, as noted previously, these emissions would be well below *de minimis* thresholds. Consequently, OSB training activities, in combination with other Federal and non-Federal activities, including the proposed F-35A Beddown, would not be expected to create major increases in CO emissions. No other adverse cumulative impacts on the region's airshed are anticipated as a result of the Proposed Action or other ongoing or proposed actions in the region.

According to the 95th Wing Base (2008), U.S. military aircraft used approximately 0.5 percent of the aviation fuel consumed in 2000. Historically, the aviation sector has been estimated to emit about 2.6 percent of the nation's GHG emissions; thus, U.S. military aircraft contribute a very small portion of these gases (U.S. General Accounting Office [GAO] 2000). Currently, no universal standard has been accepted to determine the significance of cumulative impacts of

GHG emissions. In the absence of any controlling standard, the emissions associated with OSB operations would not be expected to significantly contribute to climate change on a cumulative basis, and would not significantly add to the GHG emissions occurring nationwide or globally.

5.2.3 Socioeconomics and Environmental Justice

The balance of ongoing and anticipated military actions is likely to have a long-term, strong positive effect on regional economy, even though there may be local differences in effects. Since the nation and the region have experienced a recent (2008) downturn in employment and personal income, the Proposed Action and other military projects that are ongoing or planned (e.g., F-35A beddown) would result in beneficial cumulative impacts. Depending upon the timing of construction projects, temporary immigration of laborers may exceed capacity of local and regional accommodations; however, renovation and construction associated with the F-35A beddown, if it occurs at TIA, would be expected to occur over the next 5 years; thus, the cumulative impact of the construction activities should be minimal.

The Proposed Action would cause minor cumulative disproportionate impacts on minorities and low-income populations relative to the COC. However, these effects would occur under the No Action alternative as well. The proposed increase of OSB sorties would expand the 65 dBA DNL contour in areas southeast of the base where there are no residences or other noise-sensitive receptors. The incremental effects of the proposed OSB training missions, in combination with potential impacts associated with the past and reasonably foreseeable future actions described in this section, would not be expected to have any major adverse cumulative effects on minority or low-income populations or on children.

5.2.4 Public Safety

Airspace management and air safety are vulnerable to incremental effects and, if the cumulative actions were to overload the capacity of the airspace or the controller's ability to manage flight activity, then cumulative impacts would be considered significant. Several actions have taken place at DMAFB, TIA, Luke AFB, Yuma Marine Air Corps Station, and BMGR over the last decade that have increased or decreased operations and changed aircraft type, number of operations, and support staff. As a result, airspace demand and resulting safety issues at the airfield and surrounding areas have also varied.

Cumulative effects on regional airspace would occur where the airspace is used and controlled by FAA and DoD. As completion of the F-35A beddown comes to fruition, the level of use of restricted airspace in southern Arizona would increase (if it occurs at Luke AFB or TIA), requiring more coordination between airspace managers and users to satisfy their respective missions. Increases in overflights around the City of Tucson caused by OSB and F-35A training missions would increase the risk of Class A mishaps. As mentioned previously, OSB has not reported one mishap (Class A or otherwise) in its 35+ years of existence. DMAFB and OSB have established very stringent flight rules, especially regarding the altitudes and speeds of aircraft approaching landing over the City of Tucson. The Proposed Action would not contribute to any significant cumulative risk to public safety. Beddown and operation of F-35A aircraft at TIA would contribute to cumulative impacts regarding additional sorties and, thus, more opportunities for mishaps; however, the Draft EIS has reported that there would be no anticipated measurable increase in safety risks associated with aircraft mishaps.

5.3 Other Environmental Considerations

5.3.1 Relationship between Short-Term Uses and Long-Term Productivity

CEQ regulations (Section 1502.16) specify that environmental analysis must address "…the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Special attention should be given to impacts that narrow the range of beneficial uses of the environment in the long-term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits compared to the long-term productivity derived from not pursuing the Proposed Action.

A short-term use of the environment is generally defined as a direct temporary consequence of a project in its immediate vicinity. Short-term effects could include localized disruptions and higher noise levels. Under the Proposed Action, short-term uses of the environment would result in noise from aircraft operations. Noise generated by OSB aircraft sorties would be temporary and sporadic, and would not be expected to result in adverse effects on noise-sensitive receptors, wildlife, or livestock.

The long-term impacts of the OSB training missions would primarily involve additional use of airspace. These changes in airspace use would not impact the long-term productivity of the land and natural resources. As indicated in Table 4-2, the OSB training events would be less than 7 percent of the DMAFB daily activities.

5.3.2 Irreversible and Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses to identify "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented" (40 CFR Section 1502.16). Primary irreversible effects result from permanent use of a nonrenewable resource (e.g., minerals or energy). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., disturbance of a cultural site) or consumption of renewable resources that are not permanently lost (e.g., old growth forests). Secondary impacts could result from environmental accidents, such as explosive fires. Natural resources include minerals, energy, land, water, forestry, and biota. Nonrenewable resources are those resources that cannot be replenished by natural means, including oil, natural gas, and iron ore. Renewable natural resources are those resources that can be replenished by natural means, including water, lumber, and soil.

No irretrievable commitment of natural or cultural resources is expected as a result of the implementation of the Proposed Action. Military training necessarily involves consumption of nonrenewable resources, such as gasoline for vehicles/aircraft and jet fuel for aircraft.

Secondary impacts on natural resources could occur in the unlikely event of an accidental fire, such as one caused by an aircraft mishap. However, while any fire can affect agricultural resources, wildlife, and habitat, the increased risk of fire hazard due to operations under the Proposed Action is extremely low.

SECTION 6.0
REFERENCES

6.0 REFERENCES

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SECTION 7.0
LIST OF PREPARERS

7.0 LIST OF PREPARERS

The following people were primarily responsible for preparing this EA.

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Steve Kolian	Gulf South Research Corporation	Environmental Science	12 years natural resources	Air Quality and Noise
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SECTION 8.0
LIST OF ACRONYMS AND ABBREVIATIONS

8.0 LIST OF ACRONYMS AND ABBREVIATIONS

162 FW	162nd Fighter Wing
355 FW	355th Fighter Wing
$\mu g/m^3$	micrograms per cubic meter
ABD	Average Busy Day
ACC	Air Combat Command
ACS	American Community Survey
ADOT	Arizona Department of Transportation
AEZ	Airport Environs Zone
AFB	Air Force Base
AFI	Air Force Instruction
AGE	aerospace ground equipment
AGL	above ground level
AICUZ	Air-Installation Compatible Use Zone
Air Force	United States Air Force
AMRG	Aerospace Maintenance and Regeneration Group
ANG	Air National Guard
APZ	Accident Potential Zones
ARTCC	Air Route Traffic Control Center
ASA	Air Sovereignty Alert
ATCAA	Air Traffic Control Assigned Airspace
BMGR	Barry M. Goldwater Range
Caltrans	California State Department of Transportation
CBP	U.S. Customs and Border Protection
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIP	Capital Improvement Projects
CO	Carbon Monoxide
CO_2E	CO_2 equivalent
COC	Community of Comparison
CPNWR	Cabeza Prieta National Wildlife Refuge
CSAR	Combat Search and Rescue
dB	decibel
dBA	A-Weighted Decibels
Detachment 1	Det 1
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DMAFB	Davis-Monthan Air Force Base
EA	Environmental Assessment
EDMS	Emission and Dispersion Modeling System
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EJ	environmental justice
EO	Executive Order
ETAC	East Tactical Range
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FL	Flight Level
FONSI	Finding of No Significant Impact

FW	Fighter Wing
GHG	greenhouse gases
IICEP	Interagency/Intergovernmental Coordination for Environmental Planning
JLUS	Joint Land Use Study
LATN	Low Altitude Tactical Navigation
LOLA	Live Ordnance Loading Area
mg/m^3	milligrams per cubic meter
MOA	Military Operations Area
MSL	mean sea level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NOA	Notice of Availability
NO_2	Nitrogen Dioxide
NTAC	North Tactical Range
O_3	Ozone
OSB	Operation Snowbird
PAO	Public Affairs Office
PCPI	Per Capita Personal Income
PDEA	Preliminary Draft Environmental Assessment
PM-2.5	particulate matter less than 2.5 microns
PM-10	particulate matter less than 10 microns
ppb	parts per billion
ppm	parts per million
RA	restricted areas
RMP	Ramp Management Plan
ROI	Region of Influence
SBA	Small Business Administration
SAIPE	Small Area Income and Poverty Estimates
SEL	sound exposure level
SO_2	Sulfur Dioxide
STAC	South Tactical Range
TIA	Tucson International Airport
TP	Training Plan
TREO	Tucson Regional Economic Opportunities
TUSD	Tucson Unified School District
UAE	United Arab Emirates
UA Tech Park	University of Arizona Science and Technology Park
USBP	U.S. Border Patrol
USEPA	United States Environmental Protection Agency

APPENDIX A
PUBLIC NOTICE AND SCOPING MATERIAL

Bu 850102

ARIZONA DAILY STAR

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Debbie Capanear, being first duly sworn deposes and says: that she is the Legal Advertising Representative of **TNI PARTNERS,** a General Partnership organized and existing under the laws of the State of Arizona, and that it prints and publishes the Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached and was printed and

Legal Notice

published correctly in the entire issue of the said Arizona Daily Star on each of the following dates, to-wit:

SEPTEMBER 12, 2011

Debbie Capanear

Subscribed and sworn to before me this 6 day of October, 2011

Lisa Diane Rodriguez
Notary Public

My commission expires 9/27/2013

AD NO. 7586621

Notary Public State of Arizona
Pima County
Lisa Diane Rodriguez
My Commission Expires
09/27/2013

Public Notice of a Public Scoping Meeting Proposed Implementation of National Guard Bureau's Training Plan 60-1 in Support of Operation Snowbird Davis-Monthan Air Force Base, Arizona

The U.S. Air Force announces the plans to conduct two public scoping meetings to facilitate the preparation of an Environmental Assessment (EA) that evaluates the proposed implementation of National Guard Bureau's (NGB) Training Plan 60-1 at Davis-Monthan (DMAFB), Arizona. The TP 60-1 is proposed for implementation in support of Operation Snowbird (OSB), which is a program that is managed by Air National Guard's (ANG) 162nd Fighter Wing (162 FW), Detachment 1. NGB is in the process of updating the TP 60-1, which has triggered the need for analysis, in compliance with the National Environmental Policy Act (NEPA) of 1969. As part of the NEPA process, the U.S. Air Force and NGB will conduct scoping meetings to solicit input from the public regarding the proposed action and alternatives. Other alternatives currently being considered include the No Action Alternative, which entails the continuation of OSB at 2002 levels; addition of other U.S. aircraft at 2002 level of operations; and the addition of U.S. and foreign aircraft at 2002 level of operations.

Two open house scoping meetings will be held on 27 September and 28 September from 5:30 pm until 8:00 pm. The first meeting will be conducted at the Sheraton Four Points, 1900 East Speedway, Tucson, Arizona 85719, and the second meeting will be held at the Empire High School, 101701 East Mary Ann Cleveland Way, Tucson, Arizona 85747. No formal presentations will be provided; however, subject matter experts will be on-site to answer questions. Questions regarding the meeting or the EA can be submitted via e-mail at 355wgpa@dm.af.mil, subject line "OSB EA COMMENT SUBMITTAL." Comments or input regarding the alternatives or potential impacts on sensitive resources can be submitted at either of the meetings or later via U.S. Postal Service at the following address: DMAFB Public Affairs Office to the following address: ATTN: OSB EA COMMENT SUBMITTAL, 355th Fighter Wing Public Affairs, 3180 S. First Street, Davis-Monthan AFB, Arizona 85707. Information must be provided by 28 October 2011. Once the EA is prepared, it will be released for public review and comment for a period of 30 days.

Publish September 12, 2011
Arizona Daily Star

PUBLIC SCOPING MEETING HANDOUT
ENVIRONMENTAL ASSESSMENT
Proposed Implementation of the National Guard Bureau's
Updated Training Plan 60-1,
Davis-Monthan Air Force Base, Arizona

The National Guard Bureau (NGB), Air National Guard (ANG) has recently updated their Training Plan (TP) 60-1. This updated plan addresses the NGB's management of Operation Snowbird (OSB) at Davis-Monthan Air Force Base (DMAFB), Arizona. OSB is a program that is managed by ANG's 162nd Fighter Wing (162 FW), Detachment 1 (Det 1). Separate from OSB, routine ANG activities are conducted by the 162 FW out of the Tucson International Airport (TIA).

OSB has been in existence since 1975 and was originally designed and implemented to allow ANG units from bases located in northern latitudes (or "northern tier") to train in optimal weather conditions and vast airspace over southern Arizona, primarily during the winter months. The OSB program is headquartered out of DMAFB, which is one of the U.S. Air Force's Air Combat Command (ACC) bases. The 162 FW Det 1 OSB is considered a tenant at DMAFB, and the OSB activities discussed in this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 are being addressed by Headquarters (HQ), ACC.

The 355th Fighter Wing (355 FW) completed an EA and a Finding of No Significant Impact (FONSI) was issued in 1978 to address the new activities occurring under OSB at DMAFB. Another NEPA document prepared since that time that included analysis of OSB activities was the 2002 *Final Environmental Assessment for the West Coast Combat Search and Rescue (CSAR) Beddown.* Thus, that 2002 EA will be used as the baseline for the EA to be prepared to assess the potential impacts on the human and natural environment of the proposed implementation of the NGB TP 60-1 at DMAFB.

DMAFB provides all of the facilities and assets essential to the success of NGB's training mission. These include but are not limited to:

Facilities and Administration

- 13,643-foot runway
- Live Ordnance Loading Area Live munitions storage and build-up facilities
- Bulk Fuel Storage/Loading Area
- On-base medical, lodging, and dining facilities
- On-base master mechanics/maintenance for the A-10 and F-16 aircraft

Infrastructure Assets

- Secure communications
- Data link infrastructure
- Dedicated aerospace ground equipment (AGE)
- Access to existing engine analysis laboratory
- Existing, dedicated ramp space

Safety and Operational Assets

- Crash/Fire/Rescue response unit
- Immediate access to hydrazine storage and emergency response for F-16 aircraft
- Existing Anti-terrorism and Force Protection systems
- Close proximity to available military airspace and enhanced electronic tactical ranges

The NGB and ACC, through the U.S. Army Corps of Engineers (USACE), Sacramento District intends to prepare an Environmental Assessment (EA) to address the potential effects of the implementation of the NGB TP 60-1 at DMAFB. The EA will assess the environmental and socioeconomic impacts, adverse and beneficial, of all reasonable alternatives that satisfy the NGB's purpose and need for the training mission. The No Action Alternative, as required by NEPA, will also be considered in the EA. The No Action Alternative would maintain the level and types of aircraft that were analyzed in the 2002 EA. The EA will provide information on all reasonable alternatives with regards to existing conditions and present use, and potential cumulative effects to socioeconomic and environmental concerns.

The public scoping meeting is being conducted to provide a forum that allows the public to make comments and provide input relevant to the proposed action, alternatives and proposed areas of analysis. In addition, the meeting provides a forum for the Air Force to discuss the NEPA process and the alternatives currently being considered.

The public is invited to attend the informal meeting and ask questions or provide comments regarding the proposed alternatives. It is requested that all comments be provided comments either be provided on the attached comment sheet, or sent via e-mail to DMAFB at 355wgpa@dm.af.mil. All comments will be considered during the preparation of the EA. Please refer questions to officials attending the public meeting. Written comments following the public meeting will be accepted through 26 October 2011 and can be sent to the DMAFB Public Affairs Office at the following address:

ATTN: OSB EA COMMENT SUBMITTAL, 355th Fighter Wing Public Affairs, 3180 S. First Street, Davis-Monthan AFB, AZ 85707

APPENDIX B
AIR QUALITY CALCULATIONS

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18068 Federal Register/Vol. 63, No. 70/Monday, April 13, 1998/Notices

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[Docket No. 29194]

RIN 2120-AC22

Emissions and Dispersion Modeling System Policy for Airport Air Quality Analysis; Interim Guidance to FAA Orders 1050.1D and 5050.4A

AGENCY: Federal Aviation Administration, DOT.

ACTION: Policy Statement.

SUMMARY: This document provides a statement of Federal Aviation Administration (FAA) policy concerning the required use of the FAA Emissions and Dispersion Modeling System (EDMS) to assess the air quality impacts of proposed airport development projects. To date, the EDMS has been considered an FAA preferred model for airport air quality analysis. The policy statement is intended to ensure consistency and quality of analysis performed to assess the air quality impacts of airport emission sources for purposes of complying with the National Environmental Policy Act of 1969, as amended, 42 USC §§4321 et seq (NEPA) and the Clean Air Act as amended, 42 USC 7401, 7506(c) general conformity (general conformity) requirements.

EFFECTIVE DATE: April 13, 1998.

FOR FURTHER INFORMATION CONTACT: Ms. Julie Ann Draper, Analysis and Engineering Branch (AEE-120), Technology Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-3494.

SUPPLEMENTARY INFORMATION: The EDMS was developed by the FAA in cooperation with the U.S. Air Force (USAF) in the mid-1980's as a complex source microcomputer model to assess the air quality impacts of proposed airport development projects. It has since been the FAA preferred model for airport air quality analysis. On July 20, 1993, the Environmental

Protection Agency (EPA) accepted the EDMS as a formal EPA "Preferred Guideline" model for use in civil airports and military bases. In response to the growing needs of the air quality analysis community and changes in regulations, the FAA in cooperation with the USAF re-engineered and enhanced EDMS in 1997 to create EDMS Version 3.0. EDMS Version 3.0 was built under the guidance of a government and industry advisory board composed of experts from the scientific, environmental policy, and analysis fields.

The FAA provides guidance on the use of EDMS in FAA Report No. AEE-AEE-97-03, "Air Quality Procedures for Civilian Airports and Air Force Bases," which updates and replaces the original version of the handbook, FAA Report No. FAA-82-21.

The FAA is taking this opportunity to identify EDMS as the *required* model to perform the air quality analyses for aviation emission sources from airport projects instead of the *preferred* model, as stated in the FAA's "Air Quality Procedures for Civilian Airports and Air Force Bases." This policy statement will serve as the interim written document until the revised FAA Orders 1050, Policies and Procedures for Considering Environmental Impacts, and 5050, Airport Environmental Handbook, are published.

Policy Statement

EDMS is designed to assess the air quality impacts of airport emission sources, particularly *aviation* sources, which consist of aircraft, auxiliary power units, and ground support equipment. EDMS also offers the capability to model other airport emission sources that are not aviation-specific, such as power plants, fuel storage tanks, and ground access vehicles.

Except for air toxics or where advance written approval has been granted to use an equivalent methodology and computer model by the FAA Office of Environment and Energy (AEE-120), the air quality analyses for aviation emission sources from airport projects conducted to satisfy NEPA and general conformity requirements under the Clean Air Act must be prepared using the most recent EDMS model available at the start of the environmental analysis process. In the event that EDMS is updated after the environmental analysis process is underway, the updated version of EDMS may be used to provide additional disclosure concerning air quality but use is not required. A complete description of all inputs, particularly the specification of non-default data, should be included in the documentation of the air quality analysis for purposes of complying with NEPA and general conformity requirements. Users also must provide one copy of EDMS input files used in the analysis and the corresponding output files to the FAA responsible official on magnetic media specified by the FAA responsible official.

As stated above, EDMS currently is not designed to perform air toxic analyses for aviation sources, and may be supplemented with other air toxic methodology and models in consultation with the appropriate FAA regional program office. Use of supplemental methodology and models for more refined analysis of *non-aviation* sources also is permitted in

consultation with the appropriate FAA regional program office.

This policy is being issued in order to ensure consistency and quality of analysis performed to assess the air quality impacts of airport emission sources for purposes of complying with NEPA and general conformity requirements.

Issued in Washington, DC, on April 6, 1998.

Paul R. Dykeman,

Deputy Director of Environment and Energy.

[FR Doc. 98-9641 Filed 4-10-98; 8:45am]

EDMS 5.1 Model Inputs for SnowBird_Alternative 1 Study

Study Created:	Tue Aug 09 08:22:29 2011
Report Date:	Tue Apr 17 16:28:12 2012
Study Pathname:	C:\EDMS 5.1\SnowBird\SnowBird.edm

Study Setup

Unit System:	English
Dispersion Modeling:	Dispersion is not enabled for this study
Speciated Hydrocarbon Modeling:	Speciated Hydrocarbon Modeling is not enabled for this study
Analysis Years:	2012

Scenarios

Scenario Name:	Description:	Add a description.
Alternative 1	Aircraft Times in Mode Basis:	Performance-Based
	Taxi Time Modeling:	User-specified Taxi Times
	FOA3 Sulfur-to-Sulfate Conversion Rate:	2.400000 %

Airports

Airport Name:	Davis Monthan Afb
IATA Code:	DMA
ICAO Code:	KDMA
FAA Code:	
Country:	US
State:	Arizona
City:	Tucson
Airport Description:	Davis Monthan Afb
Latitude:	32.166°
Longitude:	-110.883°
Northing:	3558893.53
Easting:	511017.69
UTM Zone:	12
Elevation:	2704.00 feet
PM Modeling Methodology:	FOA3a (Sulfur-to-Sulfate Conversion Rate = 5.0%, Fuel Sulfur Content = 0.068%)
Airport Name:	Tucson Intl
IATA Code:	TUS
ICAO Code:	KTUS
FAA Code:	
Country:	US
State:	Arizona
City:	Tucson
Airport Description:	Tucson Intl
Latitude:	32.116°
Longitude:	-110.941°
Northing:	3553304.26
Easting:	505563.19
UTM Zone:	12
Elevation:	2643.00 feet
PM Modeling Methodology:	FOA3a (Sulfur-to-Sulfate Conversion Rate = 5.0%, Fuel Sulfur Content = 0.068%)

Scenario-Airport: Alternative 1, Davis Monthan Afb

Weather

Alternative 1, Davis Monthan Afb

Mixing Height:	3000.00 feet
Temperature:	68.00 °F
Daily High Temperature:	78.35 °F
Daily Low Temperature:	57.65 °F
Pressure:	29.92 inches of Hg
Sea Level Pressure:	29.89 inches of Hg
Relative Humidity:	33.22
Wind Speed:	6.81 knots
Wind Direction:	0.00 °
Ceiling:	99999.99 feet
Visibility:	50.00 miles

The user has used annual averages.

Base Elevation: 2704.00 feet

Date Range: Thursday, January 01, 2004 to Friday, December 31, 2004

Source Data File Location:

Upper Air Data File Location:

Quarter-Hourly Operational Profiles

Alternative 1, Davis Monthan Afb

Name: DEFAULT

Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight
12:00am to 12:14 am	1.000000	6:00am to 6:14am	1.000000	12:00pm to 12:14 pm	1.000000	6:00pm to 6:14pm	1.000000
12:15am to 12:29 am	1.000000	6:15am to 6:29am	1.000000	12:15pm to 12:29 pm	1.000000	6:15pm to 6:29pm	1.000000
12:30am to 12:44 am	1.000000	6:30am to 6:44am	1.000000	12:30pm to 12:44 pm	1.000000	6:30pm to 6:44pm	1.000000
12:45am to 12:59 am	1.000000	6:45am to 6:59am	1.000000	12:45pm to 12:59 pm	1.000000	6:45pm to 6:59pm	1.000000
1:00am to 1:14am	1.000000	7:00am to 7:14am	1.000000	1:00pm to 1:14pm	1.000000	7:00pm to 7:14pm	1.000000
1:15am to 1:29am	1.000000	7:15am to 7:29am	1.000000	1:15pm to 1:29pm	1.000000	7:15pm to 7:29pm	1.000000
1:30am to 1:44am	1.000000	7:30am to 7:44am	1.000000	1:30pm to 1:44pm	1.000000	7:30pm to 7:44pm	1.000000
1:45am to 1:59am	1.000000	7:45am to 7:59am	1.000000	1:45pm to 1:59pm	1.000000	7:45pm to 7:59pm	1.000000
2:00am to 2:14am	1.000000	8:00am to 8:14am	1.000000	2:00pm to 2:14pm	1.000000	8:00pm to 8:14pm	1.000000
2:15am to 2:29am	1.000000	8:15am to 8:29am	1.000000	2:15pm to 2:29pm	1.000000	8:15pm to 8:29pm	1.000000
2:30am to 2:44am	1.000000	8:30am to 8:44am	1.000000	2:30pm to 2:44pm	1.000000	8:30pm to 8:44pm	1.000000
2:45am to 2:59am	1.000000	8:45am to 8:59am	1.000000	2:45pm to 2:59pm	1.000000	8:45pm to 8:59pm	1.000000
3:00am to 3:14am	1.000000	9:00am to 9:14am	1.000000	3:00pm to 3:14pm	1.000000	9:00pm to 9:14pm	1.000000
3:15am to 3:29am	1.000000	9:15am to 9:29am	1.000000	3:15pm to 3:29pm	1.000000	9:15pm to 9:29pm	1.000000
3:30am to 3:44am	1.000000	9:30am to 9:44am	1.000000	3:30pm to 3:44pm	1.000000	9:30pm to 9:44pm	1.000000
3:45am to 3:59am	1.000000	9:45am to 9:59am	1.000000	3:45pm to 3:59pm	1.000000	9:45pm to 9:59pm	1.000000
4:00am to 4:14am	1.000000	10:00am to 10:14am	1.000000	4:00pm to 4:14pm	1.000000	10:00pm to 10:14pm	1.000000
4:15am to 4:29am	1.000000	10:15am to 10:29am	1.000000	4:15pm to 4:29pm	1.000000	10:15pm to 10:29pm	1.000000
4:30am to 4:44am	1.000000	10:30am to 10:44am	1.000000	4:30pm to 4:44pm	1.000000	10:30pm to 10:44pm	1.000000
4:45am to 4:59am	1.000000	10:45am to 10:59am	1.000000	4:45pm to 4:59pm	1.000000	10:45pm to 10:59pm	1.000000
5:00am to 5:14am	1.000000	11:00am to 11:14am	1.000000	5:00pm to 5:14pm	1.000000	11:00pm to 11:14pm	1.000000
5:15am to 5:29am	1.000000	11:15am to 11:29am	1.000000	5:15pm to 5:29pm	1.000000	11:15pm to 11:29pm	1.000000
5:30am to 5:44am	1.000000	11:30am to 11:44am	1.000000	5:30pm to 5:44pm	1.000000	11:30pm to 11:44pm	1.000000
5:45am to 5:59am	1.000000	11:45am to 11:59am	1.000000	5:45pm to 5:59pm	1.000000	11:45pm to 11:59pm	1.000000

Daily Operational Profiles

Alternative 1, Davis Monthan Afb

Name: DEFAULT

Day	Weight	Day	Weight
Monday	1.000000	Friday	1.000000
Tuesday	1.000000	Saturday	1.000000
Wednesday	1.000000	Sunday	1.000000
Thursday	1.000000		

Monthly Operational Profiles

Alternative 1, Davis Monthan Afb

Name: DEFAULT

Month	Weight	Month	Weight
January	1.000000	July	1.000000
February	1.000000	August	1.000000

March	1.000000	September	1.000000
April	1.000000	October	1.000000
May	1.000000	November	1.000000
June	1.000000	December	1.000000

Aircraft

Alternative 1, Davis Monthan Afb

Default Taxi Out Time:	19.000000 min	
Default Taxi In Time:	7.000000 min	
Year:	Uses Schedule?	Schedule Filename:
2012	No	(None)

Aircraft Name:
Lockheed Martin F-16 Fighting Falcon
Engine Type:
F100-PW-200 (w/AB)
Identification:
#1
Category:
SMJA

Take Off weight:	11340.00 Kgs
Approach Weight:	9525.00 Kgs
Glide Slope:	3.00°
APU Assignment:	APU GTC85-72 (200HP)
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year
Air Conditioner (ACE 802)	Electric	0.00	0.00	300.00	75.00	
Air Start (ACE 180)	Gasoline	0.00	0.00	425.00	90.00	
Aircraft Tractor (Douglas TBL-400)	Gasoline	0.00	0.00	617.00	80.00	
Belt Loader (Stewart & Stevenson TUG 660)	Gasoline	0.00	0.00	71.00	50.00	
Cargo Loader (FMC Commander 15)	Gasoline	0.00	0.00	80.00	50.00	
Cart (Taylor Dunn)	Gasoline	0.00	0.00	25.00	50.00	
Cart (Taylor Dunn)	Diesel	5.00	5.00	25.00	50.00	
Catering Truck (Hi-Way / TUG 660 chasis)	Gasoline	0.00	0.00	71.00	53.00	
Fork Lift (Toyota 5,000 lb)	Gasoline	0.00	0.00	55.00	30.00	
Fuel Truck (Dukes Transportation Services / DART 8000 to 10,000 gallon)	Gasoline	0.00	0.00	300.00	25.00	
Generator (Generic)	Gasoline	0.00	0.00	158.00	0.00	
Generator (Generic)	Diesel	0.00	120.00	158.00	82.00	
Ground Power Unit (TLD)	Gasoline	0.00	0.00	0.00	75.00	
Hydrant Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	70.00	
Lavatory Truck (Wollard TLS-770 / F350)	Gasoline	0.00	0.00	235.00	25.00	
Lift (Generic)	Diesel	5.00	5.00	115.00	50.00	
Other (Generic)	Gasoline	0.00	0.00	140.00	50.00	
Other (Generic)	Diesel	0.00	0.00	140.00	50.00	
Water Service (Gate Service)	Gasoline	0.00	0.00	0.00	20.00	

Year:
2012

Annual Departures:	895
Annual Arrivals:	895
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT

Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

Aircraft Name:
Sikorsky CH-53E Super Stallion
Engine Type:
T64-GE-100
Identification:
#1
Category:
LMTH

Take Off weight:	16783.00 Kgs
Approach Weight:	16783.00 Kgs
Glide Slope:	3.00°
APU Assignment:	APU GTCP100-544 (400 HP)
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year
Air Conditioner (ACE 802)	Diesel	0.00	0.00	300.00	75.00	
Air Start (ACE 180)	Diesel	0.00	0.00	425.00	90.00	
Aircraft Tractor (Stewart & Stevenson TUG MC)	Diesel	0.00	0.00	86.00	80.00	
Fork Lift (Toyota 5,000 lb)	Electric	0.00	0.00	55.00	30.00	
Fuel Truck (Dukes Transportation Services / DART 8000 to 10,000 gallon)	Gasoline	0.00	0.00	300.00	25.00	

Year:
2012

Annual Departures:	171
Annual Arrivals:	171
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

GSE Population

Alternative 1, Davis Monthan Afb

Type:	Fuel:	Ref. Model:	Identification:
Air Conditioner	Electric		#1

Rated Power:	75.00 hp
Load Factor:	75.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year: 2012

Population:	2 units
Yealry Operating Time:	1000.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Aircraft Tractor	Gasoline	Douglas TBL-400	#1

Rated Power:	617.00 hp
Load Factor:	80.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year: 2012

Population:	1 units
Yealry Operating Time:	300.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Fuel Truck	Gasoline	Dukes Transportation Services / DART 8000 to 10,000 gallon	#1

Rated Power:	300.00 hp
Load Factor:	25.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year: 2012

Population:	6 units
Yealry Operating Time:	150.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Ground Power Unit	Gasoline	TLD	#1

Rated Power:	75.00 hp
Load Factor:	75.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year:
2012

Population:	3 units
Yealry Operating Time:	1000.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Parking Facilities

Alternative 1, Davis Monthan Afb

None.

Roadways

Alternative 1, Davis Monthan Afb

Roadway Name:
Alternative 1Roadway

Vehicle Type:	Default Fleet Mix (all types, fuels & ages)
Fuel:	Gasoline
Manufactured Year:	2012
Average Speed:	45 mph
Roadway Length:	20.00 miles
Release Height:	

Width:	65.62 feet		
Point:	X (feet)	Y (feet)	Elevation (feet)
1	0.00	0.00	0
2	328.08	0.00	0

Year:
2012

Traffic Volume:	3000
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has NOT edited the following emission factors:

CO (g/veh):	7.324
THC (g/veh):	-1
NMHC (g/veh):	0.527
VOC (g/veh):	0.534
NOX (g/veh):	0.975
SOX (g/veh):	0.0088
PM-10 (g/veh):	0.037
PM-25 (g/veh):	0.0215
TOG (g/veh):	
BENZENE (g/veh):	0.01652
MTBE (g/veh):	0
1,3-BUTA (g/veh):	0.002243
FORMALDEHYDE (g/veh):	0.005899
ACETALDEHYDE (g/veh):	0.004269
ACROLEIN (g/veh):	0.000256

Stationary Source Name:
Stationary Sourc (2)

Stationary Category:	Fuel Tank
Stationary Type:	Horizontal: Jet Naphtha (JP-4)

This stationary source is modeled as a point

Elevation:	2704.00 feet	
Release Height:	65.62 feet	
Gas Velocity:	15.00 m/s	
Temperature:	400.00 °F	
Shell Length :	0.000000meters	
Shell Diameter :	0.000000meters	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Kiloliters Used	450
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has edited the emission factors.

Stationary Source Name:
Stationary Sourc (3)

Stationary Category:	Boiler/Space Heater
Stationary Type:	Bituminous Coal: Pulverized, Dry Bottom, Wall Fired, Pre-NSPS

This stationary source is modeled as a point

Elevation:	2704.00 feet	
Release Height:	65.62 feet	
Gas Velocity:	15.00 m/s	
Temperature:	400.00 °F	
CO EI :	0.2500Kg/Metric Ton	
TNMOC EI :	0.0300Kg/Metric Ton	
NOx EI :	11.0000Kg/Metric Ton	
SOx EI :	19.0000Kg/Metric Ton -	
PM-10 EI :	1.1500Kg/Metric Ton - 0X1.9D9301P-865sh	
Fuel Sulfur Content :	2.16 %	
Fuel Ash Content :	11.12 %	
CO Pollution Control Factor :	0.00 %	
TNMOC Pollution Control Factor:	0.00 %	
NOx Pollution Control Factor :	0.00 %	
SOx Pollution Control Factor :	0.00 %	
PM-10 Pollution Control Factor:	0.00 %	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Metric Tons Used	2
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has NOT edited the emission factors.

Stationary Source Name:
Stationary Source

Stationary Category:	Aircraft Engine Testing
Stationary Type:	Engine of My Aircraft

This stationary source is modeled as a point

Elevation:	2704.00 feet	
Release Height:	65.62 feet	
Gas Velocity:	15.00 m/s	
Temperature:	400.00 °F	
Time at 30Power :	0.00minutes/cycle	
Time at 85Power :	0.00minutes/cycle	
Time at 100Power :	0.00minutes/cycle	
Time at 7Power :	0.00minutes/cycle	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Test Cycles	12
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has edited the emission factors.

Training Fires

Alternative 1, Davis Monthan Afb

None.

Gates

Alternative 1, Davis Monthan Afb

None.

Taxiways

Alternative 1, Davis Monthan Afb

None.

Runways

Alternative 1, Davis Monthan Afb

Runway Name:	Name:	X (feet)	Y (feet)	Elevation (feet)	Glide Slope (°)
1	1	13643.00	300.00	2704.00	3.00

Runway Name:	Name:	X (feet)	Y (feet)	Elevation (feet)	Glide Slope (°)
19	19	8000.00	300.00	2704.00	3.00

Taxipaths

Alternative 1, Davis Monthan Afb

None.

Configurations

Alternative 1, Davis Monthan Afb

Configuration Name: Configuration Time Used:		From	To
0 %	Wind Direction:	no bound (°)	no bound (°)
	Wind Speed:	no bound (knots)	no bound (knots)
	Hour of Day:	no bound (hh:mm)	no bound (hh:mm)
	Ceiling:	no bound (feet)	no bound (feet)
	Visibility:	no bound (statute miles)	no bound (statute miles)
	Temperature:	no bound (°F)	no bound (°F)

Point:	Arrivals Per Hour	Departures per Hour
1	100	200
2	200	100

Aicraft Size:	Runway	Arrivals (%)	Departures (%)	Touch & Gos (%)

Buildings

Alternative 1, Davis Monthan Afb

None.

Discrete Cartesian Receptors

Alternative 1, Davis Monthan Afb

None.

Discrete Polar Receptors

Alternative 1, Davis Monthan Afb

None.

Cartesian Receptor Networks

Alternative 1, Davis Monthan Afb

None.

Polar Receptor Networks

Alternative 1, Davis Monthan Afb

None.

User-Created Aircraft

Alternative 1, Davis Monthan Afb

None.

User-Created GSE

Alternative 1, Davis Monthan Afb

None.

User-Created APU

Alternative 1, Davis Monthan Afb

None.

Scenario-Airport: Alternative 1, Tucson Intl

Weather

Alternative 1, Tucson Intl

Mixing Height:	3000.00 feet
Temperature:	68.00 °F
Daily High Temperature:	78.35 °F
Daily Low Temperature:	57.65 °F
Pressure:	27.31 inches of Hg
Sea Level Pressure:	29.90 inches of Hg
Relative Humidity:	34.69
Wind Speed:	6.67 knots
Wind Direction:	0.00 °
Ceiling:	99999.99 feet
Visibility:	50.00 miles
The user has used annual averages.	
Base Elevation:	2643.01 feet
Date Range:	Thursday, January 01, 2004 to Friday, December 31, 2004
Source Data File Location:	
Upper Air Data File Location:	

Quarter-Hourly Operational Profiles

Alternative 1, Tucson Intl

Name: DEFAULT

Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight
12:00am to 12:14 am	1.000000	6:00am to 6:14am	1.000000	12:00pm to 12:14 pm	1.000000	6:00pm to 6:14pm	1.000000
12:15am to 12:29 am	1.000000	6:15am to 6:29am	1.000000	12:15pm to 12:29 pm	1.000000	6:15pm to 6:29pm	1.000000
12:30am to 12:44 am	1.000000	6:30am to 6:44am	1.000000	12:30pm to 12:44 pm	1.000000	6:30pm to 6:44pm	1.000000
12:45am to 12:59 am	1.000000	6:45am to 6:59am	1.000000	12:45pm to 12:59 pm	1.000000	6:45pm to 6:59pm	1.000000
1:00am to 1:14am	1.000000	7:00am to 7:14am	1.000000	1:00pm to 1:14pm	1.000000	7:00pm to 7:14pm	1.000000
1:15am to 1:29am	1.000000	7:15am to 7:29am	1.000000	1:15pm to 1:29pm	1.000000	7:15pm to 7:29pm	1.000000
1:30am to 1:44am	1.000000	7:30am to 7:44am	1.000000	1:30pm to 1:44pm	1.000000	7:30pm to 7:44pm	1.000000

1:45am to 1:59am	1.000000	7:45am to 7:59am	1.000000	1:45pm to 1:59pm	1.000000	7:45pm to 7:59pm	1.000000
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2:45am to 2:59am	1.000000	8:45am to 8:59am	1.000000	2:45pm to 2:59pm	1.000000	8:45pm to 8:59pm	1.000000
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3:15am to 3:29am	1.000000	9:15am to 9:29am	1.000000	3:15pm to 3:29pm	1.000000	9:15pm to 9:29pm	1.000000
3:30am to 3:44am	1.000000	9:30am to 9:44am	1.000000	3:30pm to 3:44pm	1.000000	9:30pm to 9:44pm	1.000000
3:45am to 3:59am	1.000000	9:45am to 9:59am	1.000000	3:45pm to 3:59pm	1.000000	9:45pm to 9:59pm	1.000000
4:00am to 4:14am	1.000000	10:00am to 10:14am	1.000000	4:00pm to 4:14pm	1.000000	10:00pm to 10:14pm	1.000000
4:15am to 4:29am	1.000000	10:15am to 10:29am	1.000000	4:15pm to 4:29pm	1.000000	10:15pm to 10:29pm	1.000000
4:30am to 4:44am	1.000000	10:30am to 10:44am	1.000000	4:30pm to 4:44pm	1.000000	10:30pm to 10:44pm	1.000000
4:45am to 4:59am	1.000000	10:45am to 10:59am	1.000000	4:45pm to 4:59pm	1.000000	10:45pm to 10:59pm	1.000000
5:00am to 5:14am	1.000000	11:00am to 11:14am	1.000000	5:00pm to 5:14pm	1.000000	11:00pm to 11:14pm	1.000000
5:15am to 5:29am	1.000000	11:15am to 11:29am	1.000000	5:15pm to 5:29pm	1.000000	11:15pm to 11:29pm	1.000000
5:30am to 5:44am	1.000000	11:30am to 11:44am	1.000000	5:30pm to 5:44pm	1.000000	11:30pm to 11:44pm	1.000000
5:45am to 5:59am	1.000000	11:45am to 11:59am	1.000000	5:45pm to 5:59pm	1.000000	11:45pm to 11:59pm	1.000000

Daily Operational Profiles

Alternative 1, Tucson Intl

Name: DEFAULT

Day	Weight	Day	Weight
Monday	1.000000	Friday	1.000000
Tuesday	1.000000	Saturday	1.000000
Wednesday	1.000000	Sunday	1.000000
Thursday	1.000000		

Monthly Operational Profiles

Alternative 1, Tucson Intl

Name: DEFAULT

Month	Weight	Month	Weight
January	1.000000	July	1.000000
February	1.000000	August	1.000000
March	1.000000	September	1.000000
April	1.000000	October	1.000000
May	1.000000	November	1.000000
June	1.000000	December	1.000000

Aircraft

Alternative 1, Tucson Intl

Default Taxi Out Time:	19.000000 min	
Default Taxi In Time:	7.000000 min	
Year:	Uses Schedule?	Schedule Filename:
2012	No	(None)

Aircraft Name:
Lockheed Martin F-16 Fighting Falcon
Engine Type:
F100-PW-220 (w/AB)
Identification:
#1
Category:
SMJA

Take Off weight:	11340.00 Kgs
Approach Weight:	9525.00 Kgs
Glide Slope:	3.00°
APU Assignment:	None
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year
Air Conditioner (ACE 802)	Electric	0.00	0.00	300.00	75.00	
Air Start (ACE 180)	Gasoline	0.00	0.00	425.00	90.00	
Aircraft Tractor (Douglas TBL-400)	Gasoline	0.00	0.00	617.00	80.00	
Cart (Taylor Dunn)	Gasoline	0.00	0.00	25.00	50.00	
Cart (Taylor Dunn)	Diesel	5.00	5.00	25.00	50.00	
Catering Truck (Hi-Way / TUG 660 chasis)	Gasoline	0.00	0.00	71.00	53.00	
Fork Lift (Toyota 5,000 lb)	Gasoline	0.00	0.00	55.00	30.00	
Fuel Truck (F350)	Gasoline	0.00	0.00	235.00	25.00	
Generator (Generic)	Diesel	0.00	120.00	158.00	82.00	
Ground Power Unit (TLD)	Gasoline	0.00	0.00	0.00	75.00	
Hydrant Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	70.00	
Lavatory Truck (Wollard TLS-770 / F350)	Gasoline	0.00	0.00	235.00	25.00	
Lift (Generic)	Gasoline	0.00	0.00	115.00	50.00	
Lift (Generic)	Diesel	5.00	5.00	115.00	50.00	
Other (Generic)	Diesel	0.00	0.00	140.00	50.00	
Service Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	20.00	
Water Service (Gate Service)	Gasoline	0.00	0.00	0.00	20.00	

Year:
2012

Annual Departures:	0
Annual Arrivals:	0
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

Aircraft Name:
Sikorsky CH-53E Super Stallion
Engine Type:
T64-GE-100
Identification:
#1
Category:
LMTH

Take Off weight:	16783.00 Kgs
Approach Weight:	16783.00 Kgs
Glide Slope:	3.00°
APU Assignment:	None
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year

Year:
2012

Annual Departures:	0
Annual Arrivals:	0
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

GSE Population

Alternative 1, Tucson Intl

None.

Parking Facilities

Alternative 1, Tucson Intl

None.

Roadways

Alternative 1, Tucson Intl

None.

Stationary Sources

Alternative 1, Tucson Intl

None.

Training Fires

Alternative 1, Tucson Intl

None.

Gates

Alternative 1, Tucson Intl

None.

Taxiways

Alternative 1, Tucson Intl

Taxiway Name:	Width:	65.62 (feet)			
Taxiway	Point:	X (feet)	Y (feet)	Elevation (feet)	Speed (mph)
	1	0.00	0.00	2643.01	17.26
	2	0.00	0.00	2643.01	

Runways

Alternative 1, Tucson Intl

None.

Taxipaths

Alternative 1, Tucson Intl

None.

Configurations

Alternative 1, Tucson Intl

None.

Buildings

Alternative 1, Tucson Intl

None.

Discrete Cartesian Receptors

Alternative 1, Tucson Intl

None.

Discrete Polar Receptors

Alternative 1, Tucson Intl

None.

Cartesian Receptor Networks

Alternative 1, Tucson Intl

None.

Polar Receptor Networks

Alternative 1, Tucson Intl

None.

User-Created Aircraft

Alternative 1, Tucson Intl

None.

User-Created GSE

Alternative 1, Tucson Intl

None.

User-Created APU

Alternative 1, Tucson Intl

None.

Emissions Inventory Summary

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Aircraft	1,514.799	11.435	4.721	5.459	5.431	5.459	3.021	0.620	N/A	N/A
GSE	N/A	28.387	N/A	0.955	0.993	1.100	3.091	0.068	0.102	0.097
APUs	N/A	0.694	0.008	0.009	0.009	0.009	0.249	0.056	0.092	0.092
Parking Facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roadways	N/A	0.484	N/A	0.035	0.035	0.037	0.064	0.001	0.002	0.001
Stationary Sources	0.000	0.001	0.000	0.029	0.029	0.029	0.024	0.090	0.003	0.001
Training Fires	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grand Total	1,514.799	41.001	4.729	6.487	6.497	6.635	6.449	0.836	0.199	0.191

Aircraft Emissions Summary

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Type	Engine	ID	Euro. ...		CO2	CO	THC	NM...	VOC	TOG	NOx	SOx	PM-...	PM-...	Fuel Cons...
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	Total	1,331.384	7.322	3.215	3.717	3.697	3.717	2.873	0.545	N/A	N/A	421.992
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	APU(s)	N/A	0.604	0.005	0.006	0.006	0.006	0.158	0.041	0.066	0.066	N/A
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	GSE	N/A	0.325	N/A	0.093	0.099	0.101	1.240	0.003	0.074	0.071	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Total	183.415	4.113	1.507	1.742	1.733	1.742	0.148	0.075	N/A	N/A	58.135
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	APU(s)	N/A	0.090	0.002	0.003	0.003	0.003	0.091	0.015	0.025	0.025	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	GSE	N/A	0.000	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A

Aircraft Emissions by Mode

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Type	Engine	ID	Euro. ...	Mode	CO2	CO	THC	NM...	VOC	TOG	NOx	SOx	PM...	PM-...	Fuel Cons...
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Taxi Out	423.608	4.186	1.299	1.502	1.495	1.502	0.631	0.173	N/A	N/A	134.265
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Takeoff	564.834	1.047	0.556	0.643	0.640	0.643	1.186	0.231	N/A	N/A	179.028
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Climb Out	38.946	0.074	0.039	0.046	0.045	0.046	0.321	0.016	N/A	N/A	12.344
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Approach	106.798	0.056	0.712	0.823	0.818	0.823	0.441	0.044	N/A	N/A	33.850
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Taxi In	197.199	1.958	0.608	0.703	0.699	0.703	0.294	0.081	N/A	N/A	62.504
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Taxi Out	67.720	1.898	0.703	0.813	0.809	0.813	0.033	0.028	N/A	N/A	21.464
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Takeoff	18.528	0.017	0.001	0.001	0.001	0.001	0.044	0.008	N/A	N/A	5.873
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Climb Out	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Approach	20.769	0.039	0.002	0.002	0.002	0.002	0.034	0.009	N/A	N/A	6.583
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Taxi In	76.397	2.160	0.801	0.926	0.921	0.926	0.037	0.031	N/A	N/A	24.215

GSE Population Emissions Inventory

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Type	Fuel	Ref. Model	ID	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Air Conditioner	Electric		#1	0.000	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aircraft Tractor	Gasoline	Douglas TBL-400	#1	15.447	N/A	0.434	0.450	0.503	0.808	0.026	0.011	0.010
Fuel Truck	Gasoline	Dukes Transportation Services / DART 8000 to 10,000 ...	#1	0.534	N/A	0.055	0.057	0.064	0.161	0.011	0.004	0.004
Ground Power Unit	Gasoline	TLD	#1	12.081	N/A	0.372	0.386	0.432	0.882	0.029	0.013	0.012

Vehicular Source Emissions Inventory

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Name	Type	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Alternative 1 Roadway	Roadway	0.484	N/A	0.035	0.035	0.037	0.064	0.001	0.002	0.001

Stationary Source Emissions Inventory

(Short Tons per Year)

Alternative 1 - Davis-Monthan AFB 2012

Name	Type	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Stationary Source (2)	Stationary Source	N/A	N/A	0.029	0.029	0.029	N/A	N/A	N/A	N/A
Stationary Source (3)	Stationary Source	0.001	N/A	0.000	0.000	0.000	0.024	0.090	0.003	0.001
Stationary Source	Stationary Source	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A	N/A

EDMS 5.1 Model Inputs for SnowBird_Alternative 2 Study

Study Created:	Tue Aug 09 08:22:29 2011
Report Date:	Tue Apr 17 17:16:16 2012
Study Pathname:	C:\EDMS 5.1\SnowBird\SnowBird_Alternative 2\SnowBird_Alternative 2.edm

Study Setup

Unit System:	English
Dispersion Modeling:	Dispersion is not enabled for this study
Speciated Hydrocarbon Modeling:	Speciated Hydrocarbon Modeling is not enabled for this study
Analysis Years:	2012

Scenarios

Scenario Name:	Description:	Add a description.
Alternative 2	Aircraft Times in Mode Basis:	Performance-Based
	Taxi Time Modeling:	User-specified Taxi Times
	FOA3 Sulfur-to-Sulfate Conversion Rate:	2.400000 %

Airports

Airport Name:	Davis Monthan Afb
IATA Code:	DMA
ICAO Code:	KDMA
FAA Code:	
Country:	US
State:	Arizona
City:	Tucson
Airport Description:	Davis Monthan Afb
Latitude:	32.166°
Longitude:	-110.883°
Northing:	3558893.53
Easting:	511017.69
UTM Zone:	12
Elevation:	2704.00 feet
PM Modeling Methodology:	FOA3a (Sulfur-to-Sulfate Conversion Rate = 5.0%, Fuel Sulfur Content = 0.068%)
Airport Name:	Tucson Intl
IATA Code:	TUS
ICAO Code:	KTUS
FAA Code:	
Country:	US
State:	Arizona
City:	Tucson
Airport Description:	Tucson Intl
Latitude:	32.116°
Longitude:	-110.941°
Northing:	3553304.26
Easting:	505563.19
UTM Zone:	12
Elevation:	2643.00 feet
PM Modeling Methodology:	FOA3a (Sulfur-to-Sulfate Conversion Rate = 5.0%, Fuel Sulfur Content = 0.068%)

Scenario-Airport: Alternative 2, Davis Monthan Afb

Weather

Alternative 2, Davis Monthan Afb

Mixing Height:	3000.00 feet
Temperature:	68.00 °F
Daily High Temperature:	78.35 °F
Daily Low Temperature:	57.65 °F
Pressure:	29.92 inches of Hg
Sea Level Pressure:	29.89 inches of Hg
Relative Humidity:	33.22
Wind Speed:	6.81 knots
Wind Direction:	0.00 °
Ceiling:	99999.99 feet
Visibility:	50.00 miles

The user has used annual averages.

Base Elevation: 2704.00 feet

Date Range: Thursday, January 01, 2004 to Friday, December 31, 2004

Source Data File Location:

Upper Air Data File Location:

Quarter-Hourly Operational Profiles

Alternative 2, Davis Monthan Afb

Name: DEFAULT

Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight
12:00am to 12:14 am	1.000000	6:00am to 6:14am	1.000000	12:00pm to 12:14 pm	1.000000	6:00pm to 6:14pm	1.000000
12:15am to 12:29 am	1.000000	6:15am to 6:29am	1.000000	12:15pm to 12:29 pm	1.000000	6:15pm to 6:29pm	1.000000
12:30am to 12:44 am	1.000000	6:30am to 6:44am	1.000000	12:30pm to 12:44 pm	1.000000	6:30pm to 6:44pm	1.000000
12:45am to 12:59 am	1.000000	6:45am to 6:59am	1.000000	12:45pm to 12:59 pm	1.000000	6:45pm to 6:59pm	1.000000
1:00am to 1:14am	1.000000	7:00am to 7:14am	1.000000	1:00pm to 1:14pm	1.000000	7:00pm to 7:14pm	1.000000
1:15am to 1:29am	1.000000	7:15am to 7:29am	1.000000	1:15pm to 1:29pm	1.000000	7:15pm to 7:29pm	1.000000
1:30am to 1:44am	1.000000	7:30am to 7:44am	1.000000	1:30pm to 1:44pm	1.000000	7:30pm to 7:44pm	1.000000
1:45am to 1:59am	1.000000	7:45am to 7:59am	1.000000	1:45pm to 1:59pm	1.000000	7:45pm to 7:59pm	1.000000
2:00am to 2:14am	1.000000	8:00am to 8:14am	1.000000	2:00pm to 2:14pm	1.000000	8:00pm to 8:14pm	1.000000
2:15am to 2:29am	1.000000	8:15am to 8:29am	1.000000	2:15pm to 2:29pm	1.000000	8:15pm to 8:29pm	1.000000
2:30am to 2:44am	1.000000	8:30am to 8:44am	1.000000	2:30pm to 2:44pm	1.000000	8:30pm to 8:44pm	1.000000
2:45am to 2:59am	1.000000	8:45am to 8:59am	1.000000	2:45pm to 2:59pm	1.000000	8:45pm to 8:59pm	1.000000
3:00am to 3:14am	1.000000	9:00am to 9:14am	1.000000	3:00pm to 3:14pm	1.000000	9:00pm to 9:14pm	1.000000
3:15am to 3:29am	1.000000	9:15am to 9:29am	1.000000	3:15pm to 3:29pm	1.000000	9:15pm to 9:29pm	1.000000
3:30am to 3:44am	1.000000	9:30am to 9:44am	1.000000	3:30pm to 3:44pm	1.000000	9:30pm to 9:44pm	1.000000
3:45am to 3:59am	1.000000	9:45am to 9:59am	1.000000	3:45pm to 3:59pm	1.000000	9:45pm to 9:59pm	1.000000
4:00am to 4:14am	1.000000	10:00am to 10:14am	1.000000	4:00pm to 4:14pm	1.000000	10:00pm to 10:14pm	1.000000
4:15am to 4:29am	1.000000	10:15am to 10:29am	1.000000	4:15pm to 4:29pm	1.000000	10:15pm to 10:29pm	1.000000
4:30am to 4:44am	1.000000	10:30am to 10:44am	1.000000	4:30pm to 4:44pm	1.000000	10:30pm to 10:44pm	1.000000
4:45am to 4:59am	1.000000	10:45am to 10:59am	1.000000	4:45pm to 4:59pm	1.000000	10:45pm to 10:59pm	1.000000
5:00am to 5:14am	1.000000	11:00am to 11:14am	1.000000	5:00pm to 5:14pm	1.000000	11:00pm to 11:14pm	1.000000
5:15am to 5:29am	1.000000	11:15am to 11:29am	1.000000	5:15pm to 5:29pm	1.000000	11:15pm to 11:29pm	1.000000
5:30am to 5:44am	1.000000	11:30am to 11:44am	1.000000	5:30pm to 5:44pm	1.000000	11:30pm to 11:44pm	1.000000
5:45am to 5:59am	1.000000	11:45am to 11:59am	1.000000	5:45pm to 5:59pm	1.000000	11:45pm to 11:59pm	1.000000

Daily Operational Profiles

Alternative 2, Davis Monthan Afb

Name: DEFAULT

Day	Weight	Day	Weight
Monday	1.000000	Friday	1.000000
Tuesday	1.000000	Saturday	1.000000
Wednesday	1.000000	Sunday	1.000000
Thursday	1.000000		

Monthly Operational Profiles

Alternative 2, Davis Monthan Afb

Name: DEFAULT

Month	Weight	Month	Weight
January	1.000000	July	1.000000
February	1.000000	August	1.000000

March	1.000000	September	1.000000
April	1.000000	October	1.000000
May	1.000000	November	1.000000
June	1.000000	December	1.000000

Aircraft

Alternative 2, Davis Monthan Afb

Default Taxi Out Time:	19.000000 min	
Default Taxi In Time:	7.000000 min	
Year:	Uses Schedule?	Schedule Filename:
2012	No	(None)

Aircraft Name:
Lockheed Martin F-16 Fighting Falcon
Engine Type:
F100-PW-200 (w/AB)
Identification:
#1
Category:
SMJA

Take Off weight:	11340.00 Kgs
Approach Weight:	9525.00 Kgs
Glide Slope:	3.00°
APU Assignment:	APU GTC85-72 (200HP)
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year
Air Conditioner (ACE 802)	Electric	0.00	0.00	300.00	75.00	
Air Start (ACE 180)	Gasoline	0.00	0.00	425.00	90.00	
Aircraft Tractor (Douglas TBL-400)	Gasoline	0.00	0.00	617.00	80.00	
Belt Loader (Stewart & Stevenson TUG 660)	Gasoline	0.00	0.00	71.00	50.00	
Cargo Loader (FMC Commander 15)	Gasoline	0.00	0.00	80.00	50.00	
Cart (Taylor Dunn)	Gasoline	0.00	0.00	25.00	50.00	
Cart (Taylor Dunn)	Diesel	5.00	5.00	25.00	50.00	
Catering Truck (Hi-Way / TUG 660 chasis)	Gasoline	0.00	0.00	71.00	53.00	
Fork Lift (Toyota 5,000 lb)	Gasoline	0.00	0.00	55.00	30.00	
Fuel Truck (Dukes Transportation Services / DART 8000 to 10,000 gallon)	Gasoline	0.00	0.00	300.00	25.00	
Generator (Generic)	Gasoline	0.00	0.00	158.00	0.00	
Generator (Generic)	Diesel	0.00	120.00	158.00	82.00	
Ground Power Unit (TLD)	Gasoline	0.00	0.00	0.00	75.00	
Hydrant Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	70.00	
Lavatory Truck (Wollard TLS-770 / F350)	Gasoline	0.00	0.00	235.00	25.00	
Lift (Generic)	Diesel	5.00	5.00	115.00	50.00	
Other (Generic)	Gasoline	0.00	0.00	140.00	50.00	
Other (Generic)	Diesel	0.00	0.00	140.00	50.00	
Water Service (Gate Service)	Gasoline	0.00	0.00	0.00	20.00	

Year:
2012

Annual Departures:	663
Annual Arrivals:	663
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT

Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

Aircraft Name:
Sikorsky CH-53E Super Stallion
Engine Type:
T64-GE-100
Identification:
#1
Category:
LMTH

Take Off weight:	16783.00 Kgs
Approach Weight:	16783.00 Kgs
Glide Slope:	3.00°
APU Assignment:	APU GTCP100-544 (400 HP)
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year

Year:
2012

Annual Departures:	126
Annual Arrivals:	126
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

GSE Population

Alternative 2, Davis Monthan Afb

Type:	Fuel:	Ref. Model:	Identification:
Air Conditioner	Electric		#1

Rated Power:	75.00 hp
Load Factor:	75.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year:
2012

Population:	1 units
Yealry Operating Time:	1000.00 hours
Quarter-Hourly Operational profile:	DEFAULT

Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Aircraft Tractor	Gasoline	Douglas TBL-400	#1

Rated Power:	617.00 hp
Load Factor:	80.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year: 2012

Population:	1 units
Yealry Operating Time:	200.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Fuel Truck	Gasoline	Dukes Transportation Services / DART 8000 to 10,000 gallon	#1

Rated Power:	300.00 hp
Load Factor:	25.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

Gate:	Percent

Year: 2012

Population:	6 units
Yealry Operating Time:	100.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Type:	Fuel:	Ref. Model:	Identification:
Ground Power Unit	Gasoline	TLD	#1

Rated Power:	75.00 hp
Load Factor:	75.00%

The user has selected to use the default age distribution, and has not chosen a specific age.

Analysis Year:	2012
Year of Manufacture:	N/A
Age:	N/A

	Gate:	Percent

Year:
2012

Population:	2 units
Yealry Operating Time:	1000.00 hours
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

Parking Facilities

Alternative 2, Davis Monthan Afb

None.

Roadways

Alternative 2, Davis Monthan Afb

Roadway Name:
Alternative 2Roadway

Vehicle Type:	Default Fleet Mix (all types, fuels & ages)
Fuel:	Gasoline
Manufactured Year:	2012
Average Speed:	45 mph
Roadway Length:	20.00 miles
Release Height:	

Width:	65.62 feet		
Point:	X (feet)	Y (feet)	Elevation (feet)
1	0.00	0.00	0
2	328.08	0.00	0

Year:
2012

Traffic Volume:	2200
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has NOT edited the following emission factors:

CO (g/veh):	7.324
THC (g/veh):	-1
NMHC (g/veh):	0.527
VOC (g/veh):	0.534
NOX (g/veh):	0.975
SOX (g/veh):	0.0088
PM-10 (g/veh):	0.037
PM-25 (g/veh):	0.0215
TOG (g/veh):	
BENZENE (g/veh):	0.01652
MTBE (g/veh):	0
1,3-BUTA (g/veh):	0.002243
FORMALDEHYDE (g/veh):	0.005899
ACETALDEHYDE (g/veh):	0.004269
ACROLEIN (g/veh):	0.000256

Stationary Sources

Alternative 2, Davis Monthan Afb

Stationary Source Name:
Stationary Sourc (2)

Stationary Category:	Fuel Tank
Stationary Type:	Horizontal: Jet Naphtha (JP-4)

This stationary source is modeled as a point

Elevation:	2704.00 feet
Release Height:	65.62 feet

Gas Velocity:	15.00 m/s	
Temperature:	400.00 °F	
Shell Length :	0.000000meters	
Shell Diameter :	0.000000meters	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Kiloliters Used	334
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has edited the emission factors.

Stationary Source Name:
Stationary Sourc (3)

Stationary Category:	Boiler/Space Heater
Stationary Type:	Bituminous Coal: Pulverized, Dry Bottom, Wall Fired, Pre-NSPS

This stationary source is modeled as a point

Elevation:	2704.00 feet	
Release Height:	65.62 feet	
Gas Velocity:	15.00 m/s	
Temperature:	400.00 °F	
CO EI :	0.2500Kg/Metric Ton	
TNMOC EI :	0.0300Kg/Metric Ton	
NOx EI :	11.0000Kg/Metric Ton	
SOx EI :	19.0000Kg/Metric Ton -	
PM-10 EI :	1.1500Kg/Metric Ton - 0X1.7D9301P-858sh	
Fuel Sulfur Content :	2.16 %	
Fuel Ash Content :	11.12 %	
CO Pollution Control Factor :	0.00 %	
TNMOC Pollution Control Factor:	0.00 %	
NOx Pollution Control Factor :	0.00 %	
SOx Pollution Control Factor :	0.00 %	
PM-10 Pollution Control Factor:	0.00 %	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Metric Tons Used	0
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has NOT edited the emission factors.

Stationary Source Name:
Stationary Source

Stationary Category:	Aircraft Engine Testing
Stationary Type:	Engine of My Aircraft

This stationary source is modeled as a point

Elevation:	2704.00 feet
Release Height:	65.62 feet
Gas Velocity:	15.00 m/s
Temperature:	400.00 °F
Time at 30Power :	0.00minutes/cycle

Time at 85Power :	0.00minutes/cycle	
Time at 100Power :	0.00minutes/cycle	
Time at 7Power :	0.00minutes/cycle	
Point:	X (feet)	Y (feet)
1	0.00	0.00

Year:
2012

Test Cycles	12
Quarter-Hourly Operational profile:	DEFAULT
Daily Operational profile:	DEFAULT
Monthly Operational Profile:	DEFAULT

The user has edited the emission factors.

Training Fires

Alternative 2, Davis Monthan Afb

None.

Gates

Alternative 2, Davis Monthan Afb

None.

Taxiways

Alternative 2, Davis Monthan Afb

None.

Runways

Alternative 2, Davis Monthan Afb

Runway Name:	Name:	X (feet)	Y (feet)	Elevation (feet)	Glide Slope (°)
1	1	13643.00	300.00	2704.00	3.00

Runway Name:	Name:	X (feet)	Y (feet)	Elevation (feet)	Glide Slope (°)
19	19	8000.00	300.00	2704.00	3.00

Taxipaths

Alternative 2, Davis Monthan Afb

None.

Configurations

Alternative 2, Davis Monthan Afb

Configuration Name: Configuration Time Used:		From	To
0 %	Wind Direction:	no bound (°)	no bound (°)
	Wind Speed:	no bound (knots)	no bound (knots)
	Hour of Day:	no bound (hh:mm)	no bound (hh:mm)
	Ceiling:	no bound (feet)	no bound (feet)
	Visibility:	no bound (statute miles)	no bound (statute miles)
	Temperature:	no bound (°F)	no bound (°F)

Point:	Arrivals Per Hour	Departures per Hour
1	100	200
2	200	100

Aicraft Size:	Runway	Arrivals (%)	Departures (%)	Touch & Gos (%)

Buildings

Alternative 2, Davis Monthan Afb

None.

Discrete Cartesian Receptors

Alternative 2, Davis Monthan Afb

None.

Discrete Polar Receptors

Alternative 2, Davis Monthan Afb

None.

Cartesian Receptor Networks

Alternative 2, Davis Monthan Afb

None.

Polar Receptor Networks

Alternative 2, Davis Monthan Afb

None.

User-Created Aircraft

Alternative 2, Davis Monthan Afb

None.

User-Created GSE

Alternative 2, Davis Monthan Afb

None.

User-Created APU

Alternative 2, Davis Monthan Afb

None.

Scenario-Airport: Alternative 2, Tucson Intl

Weather

Alternative 2, Tucson Intl

Mixing Height:	3000.00 feet
Temperature:	68.00 °F
Daily High Temperature:	78.35 °F
Daily Low Temperature:	57.65 °F
Pressure:	27.31 inches of Hg
Sea Level Pressure:	29.90 inches of Hg
Relative Humidity:	34.69
Wind Speed:	6.67 knots
Wind Direction:	0.00 °
Ceiling:	99999.99 feet
Visibility:	50.00 miles
The user has used annual averages.	
Base Elevation:	2643.01 feet
Date Range:	Thursday, January 01, 2004 to Friday, December 31, 2004
Source Data File Location:	
Upper Air Data File Location:	

Quarter-Hourly Operational Profiles

Alternative 2, Tucson Intl

Name: DEFAULT

Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight	Quarter-Hour	Weight
12:00am to 12:14 am	1.000000	6:00am to 6:14am	1.000000	12:00pm to 12:14 pm	1.000000	6:00pm to 6:14pm	1.000000
12:15am to 12:29 am	1.000000	6:15am to 6:29am	1.000000	12:15pm to 12:29 pm	1.000000	6:15pm to 6:29pm	1.000000
12:30am to 12:44 am	1.000000	6:30am to 6:44am	1.000000	12:30pm to 12:44 pm	1.000000	6:30pm to 6:44pm	1.000000
12:45am to 12:59 am	1.000000	6:45am to 6:59am	1.000000	12:45pm to 12:59 pm	1.000000	6:45pm to 6:59pm	1.000000
1:00am to 1:14am	1.000000	7:00am to 7:14am	1.000000	1:00pm to 1:14pm	1.000000	7:00pm to 7:14pm	1.000000
1:15am to 1:29am	1.000000	7:15am to 7:29am	1.000000	1:15pm to 1:29pm	1.000000	7:15pm to 7:29pm	1.000000
1:30am to 1:44am	1.000000	7:30am to 7:44am	1.000000	1:30pm to 1:44pm	1.000000	7:30pm to 7:44pm	1.000000
1:45am to 1:59am	1.000000	7:45am to 7:59am	1.000000	1:45pm to 1:59pm	1.000000	7:45pm to 7:59pm	1.000000
2:00am to 2:14am	1.000000	8:00am to 8:14am	1.000000	2:00pm to 2:14pm	1.000000	8:00pm to 8:14pm	1.000000
2:15am to 2:29am	1.000000	8:15am to 8:29am	1.000000	2:15pm to 2:29pm	1.000000	8:15pm to 8:29pm	1.000000
2:30am to 2:44am	1.000000	8:30am to 8:44am	1.000000	2:30pm to 2:44pm	1.000000	8:30pm to 8:44pm	1.000000
2:45am to 2:59am	1.000000	8:45am to 8:59am	1.000000	2:45pm to 2:59pm	1.000000	8:45pm to 8:59pm	1.000000
3:00am to 3:14am	1.000000	9:00am to 9:14am	1.000000	3:00pm to 3:14pm	1.000000	9:00pm to 9:14pm	1.000000
3:15am to 3:29am	1.000000	9:15am to 9:29am	1.000000	3:15pm to 3:29pm	1.000000	9:15pm to 9:29pm	1.000000
3:30am to 3:44am	1.000000	9:30am to 9:44am	1.000000	3:30pm to 3:44pm	1.000000	9:30pm to 9:44pm	1.000000

3:45am to 3:59am	1.000000	9:45am to 9:59am	1.000000	3:45pm to 3:59pm	1.000000	9:45pm to 9:59pm	1.000000
4:00am to 4:14am	1.000000	10:00am to 10:14am	1.000000	4:00pm to 4:14pm	1.000000	10:00pm to 10:14pm	1.000000
4:15am to 4:29am	1.000000	10:15am to 10:29am	1.000000	4:15pm to 4:29pm	1.000000	10:15pm to 10:29pm	1.000000
4:30am to 4:44am	1.000000	10:30am to 10:44am	1.000000	4:30pm to 4:44pm	1.000000	10:30pm to 10:44pm	1.000000
4:45am to 4:59am	1.000000	10:45am to 10:59am	1.000000	4:45pm to 4:59pm	1.000000	10:45pm to 10:59pm	1.000000
5:00am to 5:14am	1.000000	11:00am to 11:14am	1.000000	5:00pm to 5:14pm	1.000000	11:00pm to 11:14pm	1.000000
5:15am to 5:29am	1.000000	11:15am to 11:29am	1.000000	5:15pm to 5:29pm	1.000000	11:15pm to 11:29pm	1.000000
5:30am to 5:44am	1.000000	11:30am to 11:44am	1.000000	5:30pm to 5:44pm	1.000000	11:30pm to 11:44pm	1.000000
5:45am to 5:59am	1.000000	11:45am to 11:59am	1.000000	5:45pm to 5:59pm	1.000000	11:45pm to 11:59pm	1.000000

Daily Operational Profiles

Alternative 2, Tucson Intl

Name: DEFAULT

Day	Weight	Day	Weight
Monday	1.000000	Friday	1.000000
Tuesday	1.000000	Saturday	1.000000
Wednesday	1.000000	Sunday	1.000000
Thursday	1.000000		

Monthly Operational Profiles

Alternative 2, Tucson Intl

Name: DEFAULT

Month	Weight	Month	Weight
January	1.000000	July	1.000000
February	1.000000	August	1.000000
March	1.000000	September	1.000000
April	1.000000	October	1.000000
May	1.000000	November	1.000000
June	1.000000	December	1.000000

Aircraft

Alternative 2, Tucson Intl

Default Taxi Out Time:	19.000000 min	
Default Taxi In Time:	7.000000 min	
Year:	Uses Schedule?	Schedule Filename:
2012	No	(None)

Aircraft Name:
Lockheed Martin F-16 Fighting Falcon
Engine Type:
F100-PW-220 (w/AB)
Identification:
#1
Category:
SMJA

Take Off weight:	11340.00 Kgs
Approach Weight:	9525.00 Kgs
Glide Slope:	3.00°
APU Assignment:	None
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year
Air Conditioner (ACE 802)	Electric	0.00	0.00	300.00	75.00	
Air Start (ACE 180)	Gasoline	0.00	0.00	425.00	90.00	
Aircraft Tractor (Douglas TBL-400)	Gasoline	0.00	0.00	617.00	80.00	
Cart (Taylor Dunn)	Gasoline	0.00	0.00	25.00	50.00	
Cart (Taylor Dunn)	Diesel	5.00	5.00	25.00	50.00	

Catering Truck (Hi-Way / TUG 660 chasis)	Gasoline	0.00	0.00	71.00	53.00
Fork Lift (Toyota 5,000 lb)	Gasoline	0.00	0.00	55.00	30.00
Fuel Truck (F350)	Gasoline	0.00	0.00	235.00	25.00
Generator (Generic)	Diesel	0.00	120.00	158.00	82.00
Ground Power Unit (TLD)	Gasoline	0.00	0.00	0.00	75.00
Hydrant Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	70.00
Lavatory Truck (Wollard TLS-770 / F350)	Gasoline	0.00	0.00	235.00	25.00
Lift (Generic)	Gasoline	0.00	0.00	115.00	50.00
Lift (Generic)	Diesel	5.00	5.00	115.00	50.00
Other (Generic)	Diesel	0.00	0.00	140.00	50.00
Service Truck (F250 / F350)	Gasoline	0.00	0.00	235.00	20.00
Water Service (Gate Service)	Gasoline	0.00	0.00	0.00	20.00

Year:
2012

Annual Departures:	0
Annual Arrivals:	0
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT
Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

Aircraft Name:
Sikorsky CH-53E Super Stallion
Engine Type:
T64-GE-100
Identification:
#1
Category:
LMTH

Take Off weight:	16783.00 Kgs
Approach Weight:	16783.00 Kgs
Glide Slope:	3.00°
APU Assignment:	None
APU Departure OP Time:	13.00 min
APU Arrival OP Time:	13.00 min
Gate Assignment:	None

Assigned GSE/AGE:	FUEL	Arrival Op Time (mins)	Departure Op Time (mins)	Horsepower (hp)	Load Factor (%)	Manufactured Year

Year:
2012

Annual Departures:	0
Annual Arrivals:	0
Annual TGOs:	0
Taxi Out Time:	Determined by Sequencing model
Taxi In Time:	Determined by Sequencing model

Departure Quarter-Hourly Operational profile:	DEFAULT
Departure Daily Operational Profile:	DEFAULT
Departure Monthly Operational Profile:	DEFAULT
Arrival Quarter-Hourly Operational profile:	DEFAULT
Arrival Daily Operational Profile:	DEFAULT

Arrival Monthly Operational Profile:	DEFAULT
Touch & Go Quarter-Hourly Operational profile:	DEFAULT
Touch & Go Daily Operational Profile:	DEFAULT
Touch & Go Monthly Operational Profile:	DEFAULT

GSE Population

Alternative 2, Tucson Intl

None.

Parking Facilities

Alternative 2, Tucson Intl

None.

Roadways

Alternative 2, Tucson Intl

None.

Stationary Sources

Alternative 2, Tucson Intl

None.

Training Fires

Alternative 2, Tucson Intl

None.

Gates

Alternative 2, Tucson Intl

None.

Taxiways

Alternative 2, Tucson Intl

Taxiway Name:	Width:	65.62 (feet)			
Taxiway	Point:	X (feet)	Y (feet)	Elevation (feet)	Speed (mph)
	1	0.00	0.00	2643.01	17.26
	2	0.00	0.00	2643.01	

Runways

Alternative 2, Tucson Intl

None.

Taxipaths

Alternative 2, Tucson Intl

None.

Configurations

Alternative 2, Tucson Intl

None.

Buildings

Alternative 2, Tucson Intl

None.

Discrete Cartesian Receptors

Alternative 2, Tucson Intl

None.

Discrete Polar Receptors

Alternative 2, Tucson Intl

None.

Cartesian Receptor Networks

Alternative 2, Tucson Intl

None.

Polar Receptor Networks

Alternative 2, Tucson Intl

None.

User-Created Aircraft

Alternative 2, Tucson Intl

None.

User-Created GSE

Alternative 2, Tucson Intl

None.

User-Created APU

Alternative 2, Tucson Intl

None.

Emissions Inventory Summary

(Short Tons per Year)

Alternative 2 - Davis- Monthan AFB 2012

Category	CO2	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Aircraft	1,121.413	8.454	3.492	4.037	4.016	4.037	2.237	0.459	N/A	N/A
GSE	N/A	18.949	N/A	0.643	0.669	0.741	2.152	0.046	0.073	0.070
APUs	N/A	0.514	0.006	0.007	0.007	0.007	0.184	0.041	0.068	0.068
Parking Facilities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roadways	N/A	0.355	N/A	0.026	0.026	0.027	0.047	0.000	0.002	0.001
Stationary Sources	0.000	0.000	0.000	0.022	0.022	0.022	0.000	0.000	0.000	0.000
Training Fires	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grand Total	1,121.413	28.272	3.497	4.735	4.740	4.834	4.621	0.547	0.143	0.139

Aircraft Emissions Summary

(Short Tons per Year)

Alternative 2 - Davis-Monthan AFB 2012

Type	Engine	ID	Euro. ...		CO2	CO	THC	NM...	VOC	TOG	NOx	SOx	PM-...	PM-...	Fuel Cons...
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	Total	986.265	5.424	2.381	2.753	2.739	2.753	2.128	0.404	N/A	N/A	312.604
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	APU(s)	N/A	0.447	0.004	0.005	0.005	0.005	0.117	0.030	0.049	0.049	N/A
Lockheed Martin F-16 Fighting ...	F100-PW-200 (w/...	#1	SS	GSE	N/A	0.241	N/A	0.069	0.073	0.075	0.918	0.002	0.055	0.053	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Total	135.148	3.031	1.110	1.284	1.277	1.284	0.109	0.055	N/A	N/A	42.836
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	APU(s)	N/A	0.066	0.002	0.002	0.002	0.002	0.067	0.011	0.019	0.019	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	GSE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Aircraft Emissions by Mode

(Short Tons per Year)

Alternative 2 - Davis-Monthan AFB 2012

Type	Engine	ID	Euro. ...	Mode	CO2	CO	THC	NM...	VOC	TOG	NOx	SOx	PM...	PM-...	Fuel Cons...
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Taxi Out	313.801	3.101	0.963	1.113	1.107	1.113	0.468	0.129	N/A	N/A	99.461
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Takeoff	418.419	0.776	0.412	0.477	0.474	0.477	0.878	0.171	N/A	N/A	132.621
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Climb Out	28.850	0.055	0.029	0.034	0.034	0.034	0.238	0.012	N/A	N/A	9.144
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Approach	79.114	0.041	0.527	0.609	0.606	0.609	0.327	0.032	N/A	N/A	25.076
Lockheed Martin F-16 Fighting...	F100-PW-200 (w/...	#1	SS	Taxi In	146.081	1.451	0.450	0.521	0.518	0.521	0.218	0.060	N/A	N/A	46.302
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Startup	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Taxi Out	49.899	1.398	0.518	0.599	0.596	0.599	0.024	0.020	N/A	N/A	15.816
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Takeoff	13.652	0.012	0.001	0.001	0.001	0.001	0.033	0.006	N/A	N/A	4.327
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Climb Out	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Approach	15.303	0.028	0.001	0.001	0.001	0.001	0.025	0.006	N/A	N/A	4.851
Sikorsky CH-53E Super Stallion	T64-GE-100	#1	H2	Taxi In	56.293	1.592	0.590	0.682	0.679	0.682	0.027	0.023	N/A	N/A	17.842

GSE Population Emissions Inventory

(Short Tons per Year)

Alternative 2 - Davis-Monthan AFB 2012

Type	Fuel	Ref. Model	ID	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Air Conditioner	Electric		#1	0.000	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aircraft Tractor	Gasoline	Douglas TBL-400	#1	10.298	N/A	0.290	0.300	0.336	0.539	0.017	0.007	0.007
Fuel Truck	Gasoline	Dukes Transportation Services / DART 8000 to 10,000 ...	#1	0.356	N/A	0.037	0.038	0.043	0.107	0.007	0.003	0.003
Ground Power Unit	Gasoline	TLD	#1	8.054	N/A	0.248	0.257	0.288	0.588	0.019	0.008	0.008

Vehicular Source Emissions Inventory

(Short Tons per Year)

Alternative 2 - Davis-Monthan AFB 2012

Name	Type	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Alternative 2 Roadway	Roadway	0.355	N/A	0.026	0.026	0.027	0.047	0.000	0.002	0.001

Stationary Source Emissions Inventory

(Short Tons per Year)

Alternative 2 - Davis-Monthan AFB 2012

Name	Type	CO	THC	NMHC	VOC	TOG	NOx	SOx	PM-10	PM-2.5
Stationary Source (2)	Stationary Source	N/A	N/A	0.022	0.022	0.022	N/A	N/A	N/A	N/A
Stationary Source (3)	Stationary Source	0.000	N/A	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Stationary Source	Stationary Source	0.000	0.000	0.000	0.000	0.000	0.000	0.000	N/A	N/A