Mountain Home Air Force Base

# *Air Installations Compatible Use Zones Study*


AUDENTES FORTUNA JUVAT

391ST FTR SQ

BOLD TIGERS

389TH FIGHTER SQ

**March 2018**

100% Draft Submittal - Not For Public Release

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# Mountain Home Air Force Base, Idaho
# Air Installations Compatible Use Zones (AICUZ) Study

## 100% Draft Submittal

**March 2018**

*Prepared for:*

Air Force Civil Engineer Center
2261 Hughes Ave, Suite 155
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MEMORANDUM FOR: Area Governments

FROM: 366th Fighter Wing
1030 Liberator Street
Mountain Home AFB, ID 83648

SUBJECT: Air Installations Compatible Use Zones (AICUZ) Study

1. This AICUZ Study for Mountain Home Air Force Base (AFB) is an update of the AICUZ Study dated 1998. This update was initiated because of mission and flight procedure changes at the base as well as improved noise modeling technology and Air Force policies. It is a reevaluation of aircraft noise and accident potential related to Air Force flying operations. This update provides an aid in the development of local planning mechanisms, which will protect the public safety and health as well as preserve the operational capabilities of Mountain Home AFB.

2. The AICUZ Study contains a summary of the affected area around the base. It outlines the location of runway Clear Zones (CZs), aircraft Accident Potential Zones (APZs), and noise contours and provides recommendations for development compatible with military flight operations. It is our recommendation that local governments incorporate these recommendations into community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

3. This update provides noise contours based on the day-night average sound level (DNL) metric and utilizes a planning noise contour. Long-range planning by local land use authorities involves strategies to influence present and future uses of land. Due to the long-range nature of planning, the Air Force provides planning contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description of the long-term (5 – 10 year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by state, tribal, regional, and local planning bodies.

4. We greatly value the positive relationship that Mountain Home AFB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through such actions as minimizing night flying, avoiding flights over heavily populated areas to the extent practicable, and installing jet engine noise suppressers for maintenance activities. We solicit your cooperation in implementing the recommendations and guidelines presented in this AICUZ Study update.

**JOSEPH D. KUNKEL, Colonel, USAF**
**Commander, 366th Fighter Wing**

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| **347 TFW** | 347th Tactical Fighter Wing |
| **366 FW** | 366th Fighter Wing |
| **366 MSG** | 366th Mission Support Group |
| **366 MXG** | 366th Maintenance Group |
| **366 OG** | 366th Operations Group |
| **366 OSS** | 366th Operational Support Squadron |
| **366 TFW** | 366th Tactical Fighter Wing |
| **390 ECS** | 390th Electronic Combat Squadron |
| **428 FS** | 428th Fighter Squadron |
| **726 ACS** | 726th Air Control Squadron |
| **AFB** | Air Force Base |
| **AFI** | Air Force Instruction |
| **AICUZ** | Air Installations Compatible Use Zones |
| **ANG** | Air National Guard |
| **APZ** | Accident Potential Zone |
| **ATC** | Air Traffic Control |
| **BASH** | bird/wildlife-aircraft strike hazard |
| **CFR** | Code of Federal Regulations |
| **CRC** | Control and Reporting Center |
| **CZ** | Clear Zone |
| **dB** | decibels |
| **dBA** | A-weighted decibel |
| **DNL** | day-night average sound level |
| **DoD** | Department of Defense |
| **EMI** | electromagnetic interference |
| **FAA** | Federal Aviation Administration |
| **GCA** | Ground Control Approach |
| **GCI** | ground control intercept |
| **GPS** | Global Positioning System |
| **HAFZ** | Hazards to Aircraft Flight Zone |
| **Hz** | hertz |
| **IDAPA** | Idaho Administrative Procedures Act |
| **JLUS** | Joint Land Use Study |
| **LED** | light-emitting diode |
| **NAF** | nonappropriated funds |
| **NCA** | National Conservation Area |
| **NVGs** | night vision goggles |
| **O&M** | operations and maintenance |
| **RSAF** | Republic of Singapore Air Force |

# 1.0 Introduction

This study is an update of the Mountain Home Air Force Base (AFB) Air Installations Compatible Use Zones (AICUZ) Study. This update presents and documents the changes to the AICUZ since the release of the last study in 1998. It reaffirms the U.S. Air Force (Air Force) policy of promoting public health, safety, and general welfare in areas surrounding the base while seeking development compatible with the defense flying mission. This update details changes in flight operations since the last study and provides planning noise contours and recommendations for achieving development compatible with the defense flying mission.

## 1.1 AICUZ Program

Military airfields attract development—people who work on base want to live nearby while others want to provide services to base employees and residents. When incompatible development occurs near an installation or training area, affected parties within the community may seek relief through political channels that could restrict, degrade, or eliminate capabilities necessary to perform the defense mission. In the early 1970s, the Department of Defense (DoD) established the AICUZ Program to protect the health, safety, and welfare of those living and working near air installations while sustaining the Air Force's operational mission. The Air Force accomplishes this goal by promoting proactive, collaborative planning for compatible development to sustain mission and community objectives.

The AICUZ Program recommends that noise levels, Clear Zones (CZs), Accident Potential Zones (APZs), and flight clearance requirements associated with military airfield operations be incorporated into local community planning programs in order to maintain the airfield's operational requirements while minimizing the impact to residents in the surrounding community. Cooperation between military airfield planners and community-based counterparts serves to increase public awareness of the importance of air installations and the need to address mission requirements and associated noise and risk factors in the public planning process. As the communities that surround airfields grow and develop, the U.S. Department of the Air Force has the responsibility to communicate and collaborate with local government on land use planning, zoning, and similar matters that could affect the installation's operations or missions. Likewise, the Air Force has a responsibility to understand and communicate potential impacts that new and changing missions may have on the local community.

## 1.2 Scope and Authority

### *1.2.1 Scope*

This AICUZ Study uses projected aircraft operations reflecting a potential long-term (5 – 10 year) aircraft noise environment to best support long-term land use planning. Noise zones, CZs, APZs, and other planning factors associated with the Mountain Home AFB runways are provided to the local communities along with recommendations for

compatible land use near the base for incorporation into comprehensive plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

### *1.2.2 Authority*

Authority for the Air Force AICUZ Program is provided in two documents:

- Air Force Instruction (AFI) 32-7063, *Air Installations Compatible Use Zones Program*, implements DoD Instruction 4165.57, *Air Installations Compatible Use Zones*, and applies to all Air Force installations with active runways located in the United States and its territories. This instruction provides guidance to installation AICUZ Program Managers with a framework that complies with Air Force Policy Directive 32-70, *Environmental Quality*.
- Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*, provides installation AICUZ Program Managers with specific guidance concerning the organizational tasks and procedures necessary to implement the AICUZ Program. It is written in a "how to" format and aligns with Air Force Policy Directive 32-70, *Environmental Quality*.

## 1.3 Previous AICUZ Efforts and Related Studies

Previous studies relevant to this update include:

- 1998 AICUZ Study
- 2013 F-35A Operational Basing Environmental Impact Statement

## 1.4 Changes that Require an AICUZ Study Update

This 2018 AICUZ Study updates the 1998 AICUZ Study for Mountain Home AFB and provides flight track, APZ, and noise zone information that reflects the most accurate picture of the installation's aircraft activities once expected minor increases in the number of F-15 aircraft assigned have occurred. As such, the AICUZ Program allows surrounding communities to consider potential future Air Force operations within a 5 – 10 year planning window when making land use decisions.

As the DoD aircraft fleet mix and training requirements change over time, the resulting flight operations change as well, affecting the noise contours. Additionally, non-operational changes may also require the need for an AICUZ study update. The primary changes since the previous AICUZ study are as follows:

- Changes in the number of F-15 aircraft assigned
- Changes in operational procedures and tempo
- Changes in noise modeling software
- Changes in AICUZ Air Force policies
- Changes in off-base land use

# 2.0 Mountain Home AFB, Idaho

## 2.1 Location

Mountain Home AFB is located in Elmore County, Idaho, about 40 miles southeast of Boise (Figure 2-1) and 12 miles south of the city of Mountain Home. The base is located in the Snake River Plain, with the Sawtooth Range located approximately 25 miles to the northeast and the Owyhee Mountains approximately the same distance to the south. The Snake River runs roughly east to west approximately 3 miles south of the installation. U.S. Highway 26 extends southeast from Boise, passing within about 10 miles of the base.

## 2.2 History

Construction of Mountain Home Army Air Field began in 1942, and it officially opened on August 7, 1943. Shortly thereafter, airmen at the field began training U.S. Army Air Force crews for the use of the B-24 Liberator in World War II. The base also received fighter aircraft to add realism to its training. In June 1945, Mountain Home also briefly served as a training base for the new B-29 Superfortress, but the Japanese surrender in August brought a swift end to the new mission and, for a time, to the base at Mountain Home. The base was placed in inactive status in October 1945.

The base remained inactive until December 1948, when the newly independent Air Force assigned the 5th Reconnaissance Group and the 5th Strategic Reconnaissance Wing and their RB-17s to Idaho and the newly renamed Mountain Home AFB. This activity was short-lived, however, lasting only until April 1950, when the base once again closed.

Less than a year later, the base was reactivated, hosting the 580th, 581st, and 582nd Air Resupply and Communications Wings over the next three years. They flew C-119, B-29, and SA-16 aircraft and trained to support covert and special operations.

When the last of these wings departed for overseas duty in 1953, the base was transferred to Strategic Air Command, which assigned its 9th Bombardment Wing to Mountain Home. The wing relocated to Mountain Home AFB in May 1953 and began flying B-29 bombers and KB-29H refueling aircraft. The 9th Bombardment Wing began converting to the new B-47 Stratojet bomber and the KC-97 tanker in September 1954, keeping alert bombers ready for war at a moment's notice and continuing its mission as a deterrent force throughout the Cold War years of the 1950s and early 1960s.

In January 1966, control of the base passed from Strategic Air Command to Tactical Air Command, which moved the 67th Tactical Reconnaissance Wing to Mountain Home. The wing flew RF-4C aircraft and conducted photographic, visual, radar, and thermal reconnaissance operations. Two years later, the wing also conducted tactical fighter operations with the addition of a squadron of F-4D Phantoms. This fighter mission lasted until late 1970 when the F-4Ds were reassigned.

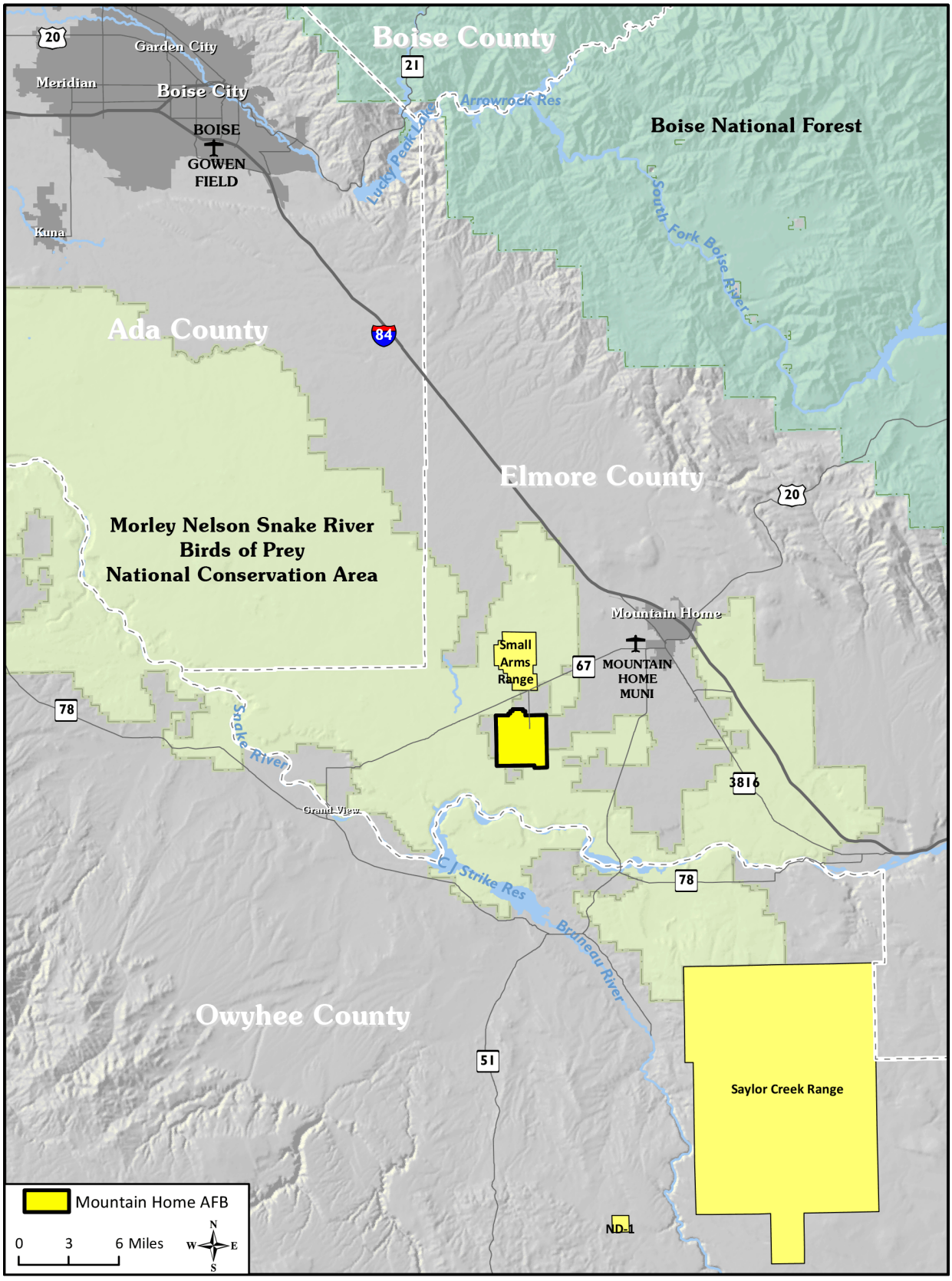


**Figure 2-1. Regional Setting**

The 347th Tactical Fighter Wing (347 TFW), equipped with F-111F Aardvarks, replaced the 67th Tactical Reconnaissance Wing as host unit of the base in May 1971. The 347 TFW had a short stay at Mountain Home, conducting F-111F training until October 1972, when the 366th Tactical Fighter Wing (366 TFW) moved from Vietnam to Mountain Home. Upon its arrival, the 366 TFW absorbed all the people and equipment of the 347 TFW.

Operations throughout the early 1980s remained stable, with the 366 TFW training F-111A and EF-111A aircrews while maintaining combat readiness for both aircraft. With the aging F-111A fleet retiring, the Air Force announced that the 366 TFW would become the Air Force's premier "air intervention" composite wing. The wing would grow from a single squadron of EF-111As to a dynamic, five-squadron wing with the ability to deploy rapidly and deliver integrated combat airpower. The air intervention composite wing's rapid transition began in October 1991, when the Air Force re-designated the wing as the 366th Wing. The wing's newly reactivated "fighter squadrons" became part of the composite wing in March 1992. The 389th Fighter Squadron began flying the dual-role F-16C Fighting Falcon, while the 391st Fighter Squadron was equipped with the new F-15E Strike Eagle.

In 1992, as part of Air Force restructuring, Strategic Air Command and Tactical Air Command merged to form Air Combat Command, and the 366th Wing gained the 34th Bomb Squadron, which flew the B-52G Stratofortress armed with the deadly, long-range HAVE NAP missile. Also in 1992, the Air Force re-designated the 390th Electronic Combat Squadron (390 ECS) as the 390th Fighter Squadron, which began flying the Air Force's premier air superiority aircraft, the F-15C Eagle, and the composite wing gained its final flying squadron when the 22nd Air Refueling Squadron was activated and equipped with the KC-135R Stratotanker. (The 390th Fighter Squadron was later designated again as 390 ECS in 2010.)

In another change, on April 1, 1994, the 34th Bomb Squadron transferred its flag to Ellsworth AFB, South Dakota. At the same time the squadron's B-52Gs were retired, making way for the squadron to be equipped with the technologically advanced B-1B Lancer. Next, a gradual transfer of the B-1s from Ellsworth to Mountain Home began in August 1996. The squadron completed a move to Mountain Home on April 1, 1997, when its flag was officially transferred to the Gunfighter home base.

Also in 1996, the wing gained yet another operational squadron. On June 21, 1996, the 726th Air Control Squadron (726 ACS) was reassigned from Shaw AFB, South Carolina, to Mountain Home. The new squadron brought mobile radar surveillance, and command and control capabilities to the composite wing

In 2002, the Air Force began consolidating its B-1B and KC-135 forces and reallocated the wing's bombers and tankers. Following the departure of these assets, the Air Force re-designated the 366th Wing as a fighter wing. With these changes, the wing's 10-year mission as the Air Force's only standing air expeditionary wing came to an end.

In May 2005, the Defense Base Closure and Realignment Commission decreed that the 389th Fighter Squadron's F-16CJs would be replaced with F-15Es and that the 390th

Fighter Squadron would lose its F-15Cs. By 2010, the last of the 390th Fighter Squadron's F-15Cs left Mountain Home.

Further, on May 9, 2006, Air Combat Command announced that a Republic of Singapore Air Force (RSAF) squadron of F-15SGs would be stationed at Mountain Home. The F-15SG was a new Foreign Military Sales Strike Eagle variant very similar to the F-15E. On May 18, 2009, the Air Force activated the 428th Fighter Squadron (428 FS) as the new RSAF unit at Mountain Home.

## 2.3 Mission

Mountain Home AFB is the home of the 366th Fighter Wing (366 FW), which is a part of Air Combat Command. The mission of the 366 FW is to prepare mission-ready Gunfighters to fight and win today's war and the next.

## 2.4 Host and Tenants Organizations

### *2.4.1 366th Fighter Wing*

The 366 FW's primary mission is to prepare airmen and their families, professionally and personally, for expeditionary operations and foster an environment that promotes integration of all facets of wing operations. The wing includes four groups:

- 366th Operations Group (366 OG) is responsible for training and equipping five assigned squadrons, including three fighter squadrons based at Mountain Home AFB while supporting two tenant units. It ensures combat readiness for short-notice worldwide Air Expeditionary Force deployments and contingency operations. It also manages and maintains the 9,026-square nautical mile Mountain Home Range Complex, supporting more than 10,575 flying hours and 6,933 local sorties in Fiscal Year 2017. About 800 personnel are assigned to the 366 OG. The 366 OG is composed of seven squadrons: the 389th, 391st, and 428th Fighter Squadrons; 366th Operations Support Squadron (366 OSS); 726 ACS; 266th Range Squadron (266 RANS); and 390 ECS.

- 366th Mission Support Group (366 MSG) provides all personnel, communications, base security, civil engineering, logistics, contracting, and morale programs to the wing's three fighter squadrons and more than 4,800 personnel. The group maintains seven combat-ready squadrons with an annual operating budget of $37 million. The 366 MSG deploys all elements worldwide to bare-base environments, establishes base infrastructure, and supports air operations. About 1,400 airmen are assigned to the 366 MSG, and the group is divided into six squadrons: the 366th Civil Engineer Squadron, 366th Communications Squadron, 366th Contracting Squadron, 366th Logistics Readiness Squadron, 366th Security Forces Squadron, and 366th Force Support Squadron.

- 366th Maintenance Group (366 MXG) is responsible for maintenance of more than 61 assigned F-15E/SG and two trainer aircraft, associated aircraft systems, support equipment, and munitions. The group develops flying and maintenance schedules to execute an annual flying hour program. It also executes deliberate and contingency war plans, ensures weapons standardization and quality assurance, and conducts training for maintenance personnel. More than 1,800 personnel are assigned to the 366 MXG, making it the largest group in the wing. It is composed of four squadrons: the 366th Aircraft Maintenance Squadron, the 366th Equipment Maintenance Squadron, the 366th Component Maintenance Squadron, and the 366th Maintenance Operations Squadron.
- 366th Medical Group provides medical services to support the combat capability of the 366 FW at deployed locations as well as the Mountain Home AFB community. The group also maintains a 24-hour urgent care center.

### *2.4.2 389th Fighter Squadron*


The 389th Fighter Squadron "Thunderbolts" include approximately 70 airmen and more than 20 F-15E aircraft. The squadron is responsible for sustaining combat readiness to conduct a variety of short-notice contingency operations worldwide. The aircrew trains to maintain world-class proficiency to accomplish a vast array of combat missions, including close air support, interdiction, defensive counter-air, strategic attack, and suppression of enemy air defenses. The "T-Bolts" are capable of employing a full arsenal of weaponry, including air-to-air missiles, 20-millimeter guns, laser or Global Positioning System (GPS) guided bombs, general purpose munitions, and stand-off weapons.

### *2.4.3 391st Fighter Squadron*


The 391st Fighter Squadron "Bold Tigers" is the largest fighter squadron in the Air Force, composed of more than 80 airmen and more than 20 F-15E aircraft. The squadron is mission ready to plan and execute all-weather/night missions, including self-escort interdiction, close air support, defensive counter-air, and suppression of enemy air defenses. The "Tigers" are capable of employing the full array of Air Force weaponry including air-to-air missiles, 20-millimeter guns, laser-guided munitions, GPS guided munitions, general purpose munitions, and stand-off weapons.

### *2.4.4 428th Fighter Squadron*


The 428 FS "Buccaneers" is the U.S. flagged flying squadron of the Peace Carvin V program, a long-term partnership with the Republic of Singapore. The squadron is dedicated to the training of Singaporean aircrew in the F-15SG, the country's newest fighter platform. The combined efforts of this program help ensure a strong U.S. relationship with Singapore, a critical partner in the region, while helping Singapore project airpower into the next generation.

### 2.4.5 366th Operation Support Squadron


The 366th Operations Support Squadron (366 OSS) "Pegasus" is responsible for all airfield activities and direct support to the 366 FW's flying missions. The 366 OSS is a diverse squadron, consisting of more than 200 personnel in six unique flights: Aircrew Flight Equipment; Airfield Operations, consisting of Air Traffic Control (tower), Radar Approach Control, and Airfield Management; Intelligence; Current Operations, consisting of range and airspace, scheduling, flight management; Weapons and Tactics; and Weather.

### 2.4.6 266th Range Squadron


The 266 RANS is an Idaho Air National Guard squadron responsible for providing quality electronic simulations of ground-based air defense threats on the Mountain Home Range Complex. Cowboy Control, which is a division of the 266 RANS, exercises positive control of Mountain Home Range Complex and Saddle Airspace and also provides ground control intercept (GCI) training support. Cowboy Control also provides GCI instruction for Republic of Singapore students.

### 2.4.7 390th Electronic Combat Squadron


The 390 ECS "Wild Boars" are tasked with manning, training, and equipping Air Force aircrew to employ expeditionary U.S. Navy EA-18G Growlers in support of Unified Commanders' plans. This unique electronic attack capability is designed to degrade or destroy enemy air defense systems by suppression of enemy radars and communications with complex, directional jamming and High-Speed Anti-Radiation Missiles. The 390 ECS is assigned to the 366 OG and is stationed at Naval Air Station Whidbey Island, Washington.

### 2.4.8 726th Air Control Squadron


The 726 ACS, or "Hardrock," is a tenant unit of the 366 OG. It reports to the 552d Air Control Group, 552d Air Control Wing, Tinker AFB, Oklahoma. As a Control and Reporting Center (CRC), they are responsible for mobile, decentralized command and control of joint operations by conducting threat warning, battle management, theater missile defense, weapons control, combat identification, and strategic communications. The 726 ACS is one of three Air Force active-duty CRCs stationed in the United States. In recent years, "Hardrockers" have deployed on a sustained one-to-one dwell ratio in support of Operations Iraqi Freedom, Enduring Freedom, and Noble Eagle and air defense of the Arabian Gulf.

## 2.5 Airfield Environment

As shown in Figure 2-2 and Figure 2-3, the installation's active runway is 13,510 feet long and is oriented generally northwest-southeast. Flight operations toward the south (magnetic heading 122°) are described as operating on Runway 12, while operations toward the north (magnetic heading 302°) are described as operating on Runway 30. The runway is immediately surrounded by a network of taxiways and parking aprons. Mountain Home AFB facilities that directly support flying operations include, but are not limited to, aircraft hangars for maintenance and storage, aircraft parking ramps and taxiways, the hard surface runway, assorted office buildings and support facilities such as hush houses for engine run maintenance, and munitions storage areas.

A runway is typically used in both directions and counted as two separate runways, depending on the direction of the departure. Each direction is labeled as a separate runway and numbered based on its magnetic heading, divided by 10, and rounded to a whole number.

The runway in use is determined by the direction of the prevailing winds and a variety of other factors discussed in Section 3.5. For example, if the prevailing winds are blowing (coming) "from" the north, then aircraft will take off and land toward the north on Runway 30, and if the prevailing winds are blowing (coming) "from" the south, then aircraft will take off and land toward the south on Runway 12. In other words, fixed-wing aircraft will almost always take off and land "into" the wind.

## 2.6 Local Economic Impacts

The military provides direct, indirect, and induced economic benefit to local communities through jobs and wages. Benefits include employment opportunities and increases in local business revenue, property sales, and tax revenue. According to the Idaho Department of Commerce, in 2014, Idaho's national security sector directly and indirectly supported over 10,000 jobs and generated $1.02 billion in economic activity in the state.

The economic impact of a military installation is based on annual payroll (jobs and salaries), annual expenditures, and the estimated annual dollar value of jobs created. The military further contributes to the economic development of communities through increased demand for local goods and services and increased household spending by military and civilian employees.

Based on the 2016 Economic Impact Report, Mountain Home AFB directly employs approximately 4,686 military and civilian personnel, with military dependents accounting for an additional 4,507 personnel. Mountain Home AFB's spending generated $41.92 million in local expenditures, including construction, services, and procurement methods, and created an additional 2,431 jobs in the local communities with an estimated value of $113 million annually. In total, Mountain Home AFB has an estimated total economic impact of nearly $356 million on the local economy. The majority of this economic impact was due to the annual payroll and the estimated value of jobs created.

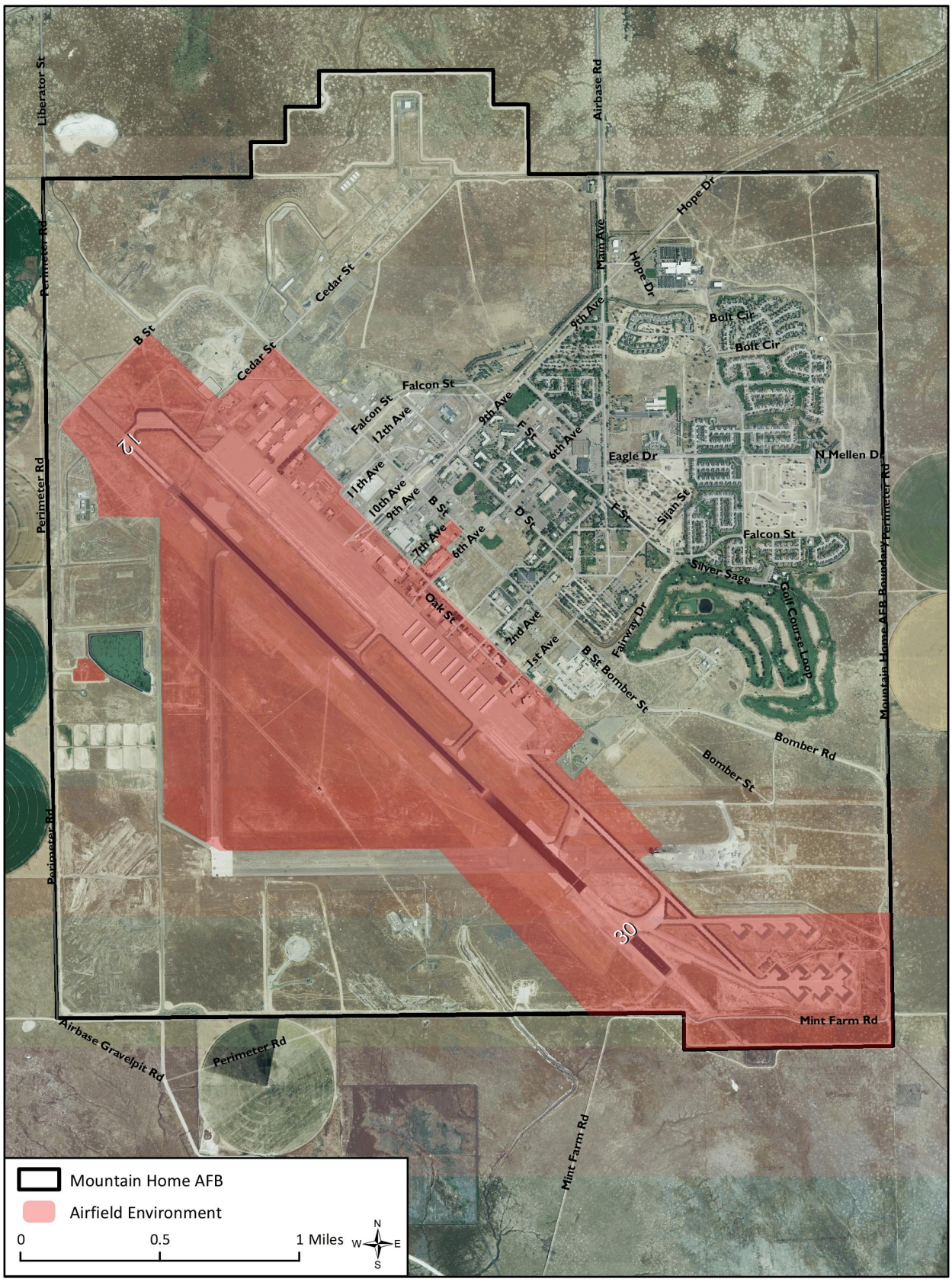


**Figure 2-2. Mountain Home AFB Airfield Environment**

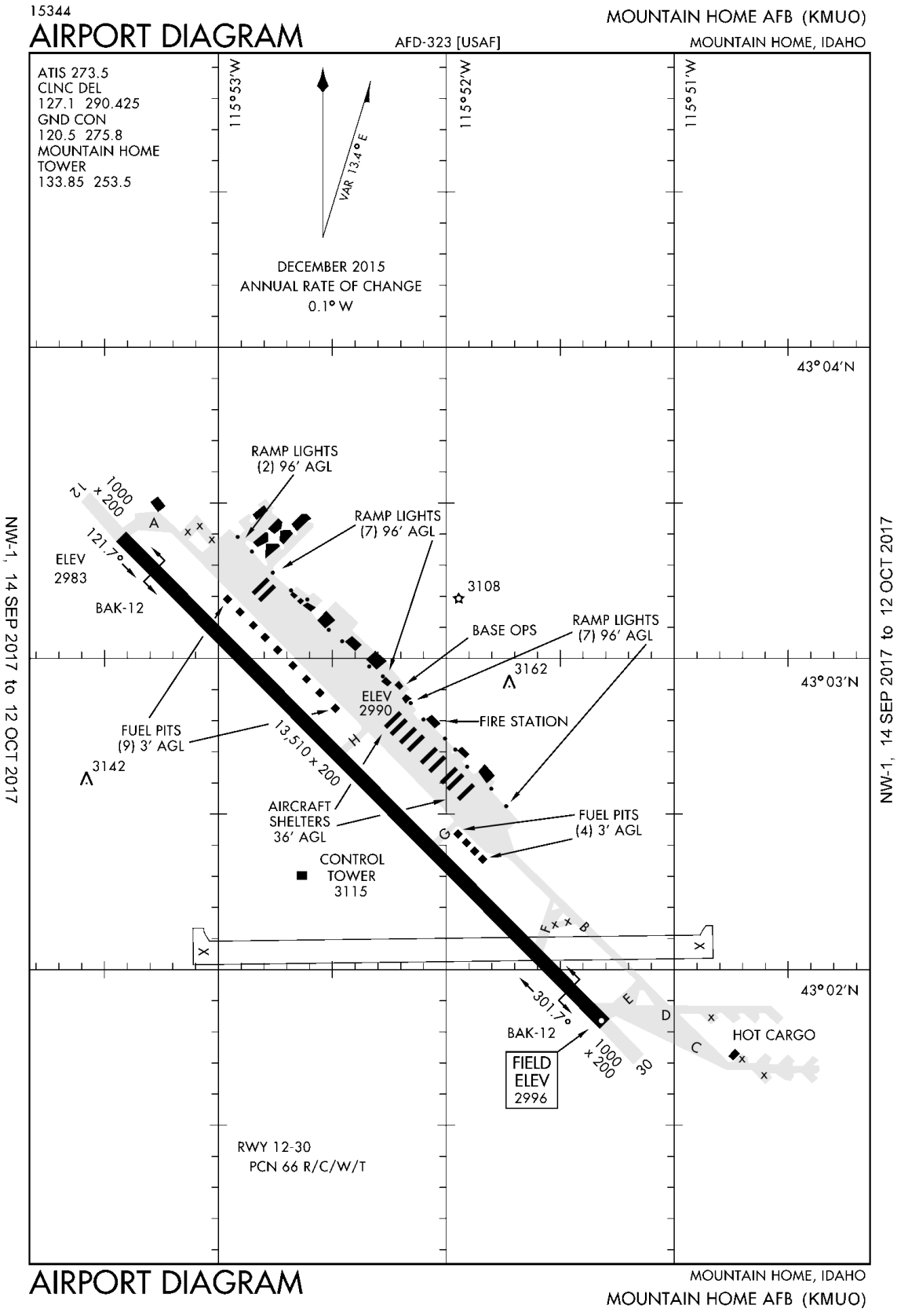


**Figure 2-3. Mountain Home AFB Airfield Diagram**

Table 2-1 through Table 2-5 provide summaries of personnel and the economic impact of the base.

**Table 2-1. Total Military and Dependent Personnel by Classification (Total Persons)**

| Classification | Total |
|---|---|
| Active duty | 3,452 |
| Nonextended Active Duty Reserve/ANG | 160 |
| Dependents | 4,507 |
| **Total** | **8,119** |

Source: Air Force, 2017
ANG = Air National Guard

**Table 2-2. Total Civilian Personnel by Appropriated and Nonappropriated Funds (Total Persons)**

| Appropriated Fund Civilians | Total |
|---|---|
| General schedule | 464 |
| Subtotal | 464 |
| **Nonappropriated Funds Air Force Civilians** | **Total** |
| Civilian nonappropriated funds | 183 |
| Civilian Base Exchange | 113 |
| Contract civilians | 299 |
| Private business | 15 |
| Subtotal | 610 |
| **Total** | **1,074** |

**Table 2-3. Annual Military Payroll by Category (Millions of Dollars)**

| Classification | Total |
|---|---|
| Active duty | $175.81 |
| Air Force Reserves/Air National Guard | $8.29 |
| Republic of Singapore | $6.64 |
| **Total** | **$190.74** |

**Table 2-4. Annual Civilian Payroll by Appropriated and Nonappropriated Funds (Millions of Dollars)**

| Appropriated Funds Civilians | Total |
|---|---|
| General schedule | $31.68 |
| Subtotal | $31.68 |
| **Nonappropriated Funds Air Force Civilians** | **Total** |
| Civilian nonappropriated funds | $2.74 |
| Civilian Base Exchange | $1.55 |
| Private business | $0.45 |
| Subtotal | $4.74 |
| **Total** | **$36.42** |

**Table 2-5. Summary of Construction, Contracts, and Expenditures for Materials, Equipment, and Supplies (Millions of Dollars)**

| Expense Category | Amount |
|---|---|
| Commissary (inventory) | $1.5 |
| Army & Air Force Exchange Service (inventory) | $0.37 |
| Health (TRICARE) | $18.39 |
| Education (tuition assistance) | $2.48 |
| Temporary duty | $2.81 |
| Other materials, equipment, supplies | $0.81 |
| O&M service contracts | $1.5 |
| Service contracts (medical+ NAF) | $4.0 |
| Construction (O&M +NAF) | $10.0 |
| **Total** | **$41.92** |

Source: Air Force, 2017

O&M = operations and maintenance; NAF = nonappropriated funds

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# 3.0 Aircraft Operations

Aircraft operations are the primary source of noise associated with a military airbase. The level of noise exposure relates to a number of variables, including the aircraft type, engine power setting, altitude flown, direction of the aircraft, flight track, temperature, relative humidity, frequency, and time of operation (day or night). This chapter discusses aircraft based at or transient to Mountain Home AFB, the types and number of operations conducted at the airfields, and the runways and flight tracks used to conduct the operations.

## 3.1 Aircraft Types

Mountain Home AFB supports the operations of flying units whose aircraft are permanently assigned and transient aircraft. Transient aircraft may be aircraft stopping over during a long cross-country trip or aircraft that come to Mountain Home AFB from their home base to practice approaches to an unfamiliar airfield. A brief description of base assigned and the most common transient aircraft is provided below.

### *3.1.1 Base Assigned Aircraft*

The F-15 Eagle is a fourth-generation, two-engine, all-weather fighter that has been in service since 1972. Air Force F-15E aircraft are designed primarily for air-to-ground missions, while F-15C/D aircraft are air-to-air variants. The F-15SG is a variant that is operated by the RSAF.

F-15

### *3.1.2 Transient Aircraft*

Some of the most common transient aircraft at Mountain Home AFB are described below.

The F-35 Lightning II is a family of single-seat, single engine, all-weather, stealth, multi-role, fifth-generation fighters. The F-35A is the conventional takeoff variant used by the Air Force. The F-35 is intended to provide the bulk of the manned tactical airpower of the Air Force, Navy, and Marine Corps over the coming decades.

F-35

The F/A-18 Hornet is a twin-engine supersonic, carrier-capable, all-weather, multi-role, fourth-generation fighter and attack aircraft. The F/A-18A is a single-seat variant and the F/A-18C is a two-seat variant. Following a set of upgrades, these two variants are re-designated F/A-18C and F/A-18D, respectively. The single-seat F/A-18E and two-seat F/A-18F, both officially named Super Hornet, carry over the name and design concept of the original F/A-18 but have been extensively redesigned.

**F/A-18**

The F-16 Fighting Falcon is a fourth-generation, single-engine, multirole, all-weather fighter aircraft that has been in service since 1979. Single- and two-seat F-16A and B aircraft that have undergone a program of upgrades are re-designated as F-16C and F-16D, respectively.

**F-16**

## 3.2 Maintenance Operations

Maintenance is an integral part of any flying operation and requires a dedicated team of professionals to ensure that units can meet their flying requirements. Two key tasks in maintaining aircraft are low- and high-powered engine maintenance runs.

Engine runs may be conducted at any power setting between idle and maximum power. Low- to mid-range powered engine runs are typically conducted on aircraft parking ramps or just outside of maintenance hangars. High-powered engine runs are typically conducted in test cells and in acoustical enclosures commonly referred to as hush houses (buildings specifically designed to muffle engine noise).

In order to facilitate on-schedule missions, maintenance engine runs sometimes occur during nighttime hours. Engine runs between 10:00 PM and 7:00 AM are infrequent, making up only 6 percent of total engine run events. The noise associated with pre-flight and engine maintenance engine runs were included in the noise analysis and modeling associated with the Mountain Home AFB noise contours.

## 3.3 Flight Operations

Flight activities, including where aircraft fly, how high they fly, how many times they fly over a given area, and the time of day they operate, must be fully evaluated to understand the relationship of flight operations and land use. This chapter discusses typical flight operations for aircraft based at Mountain Home AFB.

Each time an aircraft crosses over a runway threshold (the beginning or ending of a runway's useable surface) with the intent to take off, practice an approach, or land, it is

counted as a single flight operation. For example, a departure counts as a single operation as does an arrival. When an aircraft conducts a pattern (a departure followed by an immediate return), it counts as two operations. This is because the aircraft crosses both the approach and departure ends of the runway during the pattern.

Operations are conducted throughout the year at Mountain Home AFB, and the tempo of operations temporarily increases during large-scale simulated combat exercises. The following paragraphs and figures describe aircraft operations conducted as part of day-to-day testing and training as well as large force exercises.

The following paragraphs and figures highlight typical flight tracks that are followed during normal or increased operations. Each track is designed to maximize flight operations and, when possible, minimize the effects of noise.

- **Takeoff.** When an aircraft is positioned on the runway, the engine power is set to facilitate movement and eventual flight.
- **Departure.** For the purpose of air traffic sequencing, separation, noise abatement, compliance with avoidance areas, and overall safety of flight, aircraft follow specific ground tracks and altitude restrictions as they depart the airfield's immediate airspace.
- **Straight-in arrival.** An aircraft is aligned with the runway extended centerline and begins a gradual descent for landing. This type of approach enables an aircraft to maintain a smooth, stable, and steady approach and requires no additional maneuvering.
- **Overhead break arrival.** An expeditious arrival using visual flight rules. The aircraft arrives over the airfield on the runway centerline at a specified point and altitude and then performs a 180-degree "break turn" away from the runway to enter the landing pattern. Once established, the landing gear and flaps are lowered and the pilot performs a second 180-degree descending turn toward runway centerline to land.
- **Pattern work.** Pattern work refers to traffic pattern training where the pilot performs takeoffs and landings in quick succession by taking off, flying the pattern, and then landing. Traffic pattern training is demanding and utilizes all the basic flying maneuvers a pilot learns: takeoffs, climbs, turns, climbing turns, descents, descending turns, and straight and level landings.
- **Low approach.** A low approach is an approach to a runway that does not result in a landing but rather a descent toward the runway (usually below 500 feet above ground level) followed by a climb-out away from the airfield. Low approaches are accomplished for a number of reasons. One such reason is to practice avoiding potential ground obstructions (vehicles, debris, stray animals, etc.).
- **Touch and go.** A touch-and-go landing pattern is a training maneuver that involves landing on a runway and taking off again without coming to a full stop.

- **Box pattern.** Ground Control Approach (GCA) is a radar or "talk down" approach directed from the ground by an air traffic controller (ATC). ATC personnel provide pilots with verbal course and glide slope information, allowing them to make an instrument approach during bad weather. The GCA generally utilizes a "box-shaped" flight pattern with four 90-degree turns done at a set altitude and is used to practice a variety of approach procedures at an airfield.

- **Radar approach.** An instrument approach is provided with active assistance from ATC during poor weather conditions. ATC personnel direct the aircraft toward the runway centerline. Once established on the centerline, pilots use aircraft instruments to maintain runway alignment and adherence to altitude restrictions until the pilot is able to acquire visual sight with the runway environment. Pilots often practice this type of approach to maintain proficiency.

## 3.4 Annual Aircraft Operations

Table 3-1 lists the numbers of departure, arrival, and closed pattern operations flown by assigned Air Force, assigned RSAF, and transient aircraft during the "planning year." The "planning year" reflects the addition of F-15SG aircraft to the RSAF squadron, bringing the total number of primary aircraft assigned to the unit to 20.

**Table 3-1. Annual Flight Operations in the Planning Year**

| Aircraft | Departures | | | Arrivals | | | Closed Pattern Operations | | | Totals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day* | Night* | Total | Day* | Night* | Total | Day* | Night* | Total | Day* | Night* | Total |
| F-15E (USAF) | 6,248 | 329 | 6,577 | 6,248 | 329 | 6,577 | 22,689 | 0 | 22,689 | 35,185 | 658 | 35,843 |
| F-15SJ (RSAF) | 4,087 | 215 | 4,302 | 3,872 | 430 | 4,302 | 17,991 | 2,925 | 20,916 | 25,950 | 3,570 | 29,520 |
| Transient | 1,957 | 29 | 1,986 | 1,882 | 104 | 1,986 | 0 | 0 | 0 | 3,839 | 133 | 3,972 |
| **Grand total** | **12,292** | **573** | **12,865** | **12,002** | **863** | **12,865** | **40,680** | **2,925** | **43,605** | **64,974** | **4,361** | **69,335** |

USAF = U.S. Air Force; RSAF = Republic of Singapore Air Force

*Day = 7 AM to 10 PM; Night = 10 PM to 7 AM

## 3.5 Runway Utilization and Flight Tracks

### *3.5.1 Runway Utilization*

The frequency with which aircraft utilize a runway involves a variety of factors, including, but not limited to, the following:

- Airfield environment (layout, lights, runway length, etc.)
- Direction of prevailing winds
- Location of natural terrain features (rivers, lakes, mountains, and other features)
- Wildlife activity
- Number of aircraft in the pattern
- Preference of a runway for the purpose of safety and noise abatement

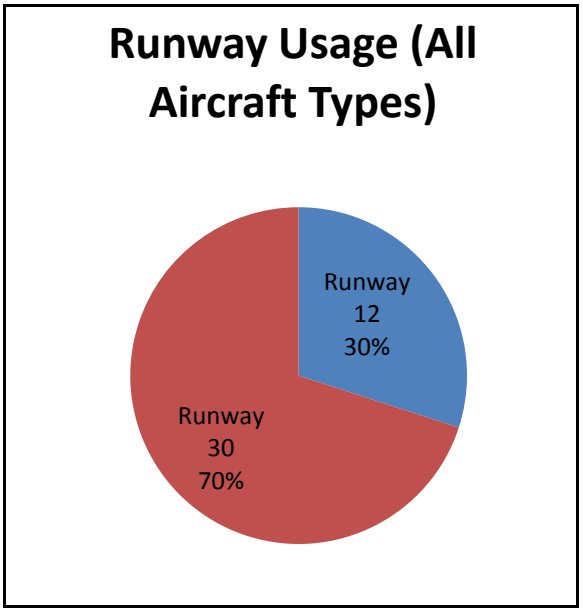


**Figure 3-1. Runway Usage**

Base Operations, control tower personnel, and the Supervisor of Flying establish the runway in use. Pattern procedures are adjusted accordingly to maximize air traffic flow efficiency. Figure 3-1 displays the relative frequency at which each runway at Mountain Home AFB is used.

### *3.5.2 Flight Tracks*

Each runway has designated flight tracks that provide for the safety, consistency, and control of an airfield. Flight tracks depict where aircraft fly in relation to an airfield. They are designed for departures, arrivals, and pattern work procedures and are designated for each runway to facilitate operational safety, noise abatement, aircrew consistency, and the efficient flow of air traffic within the tower's controlled airspace. Aircraft flight tracks are not set highways in the sky. While we show flight tracks as a line on the map, they are actually bands. Aircraft de-confliction, configuration, pilot technique, takeoff weight, and wind all affect the actual path taken on any given flight. Figure 3-2 through Figure 3-4 present the flight tracks for Mountain Home AFB.

At Mountain Home AFB, there are relatively few constraints on where aircraft can fly in the immediate vicinity of the airfield. Restricted Areas R-3203 and R-3202 are located about 9 miles to the northwest and 12 miles to the southeast of the base, respectively. When these restricted area airspace units are activated for use, non-participating aircraft are restricted from entering. The Jarbidge and Owyhee Military Operations Areas are located about 19 miles south of the base. Civilian pilots often avoid routing through Military Operations Areas while the areas are in use, although they are not forbidden from doing so.

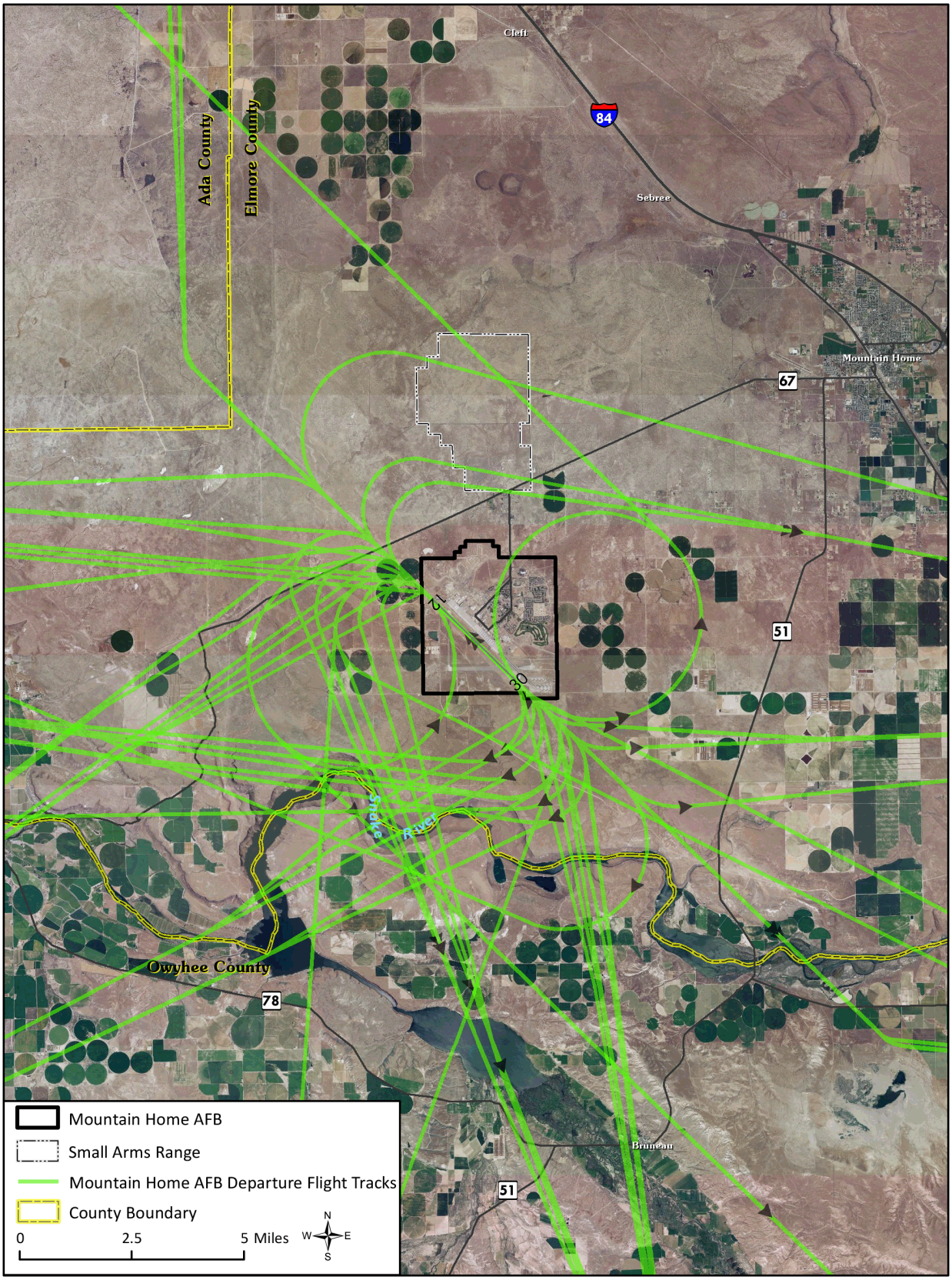


**Figure 3-2. Departure Flight Tracks**

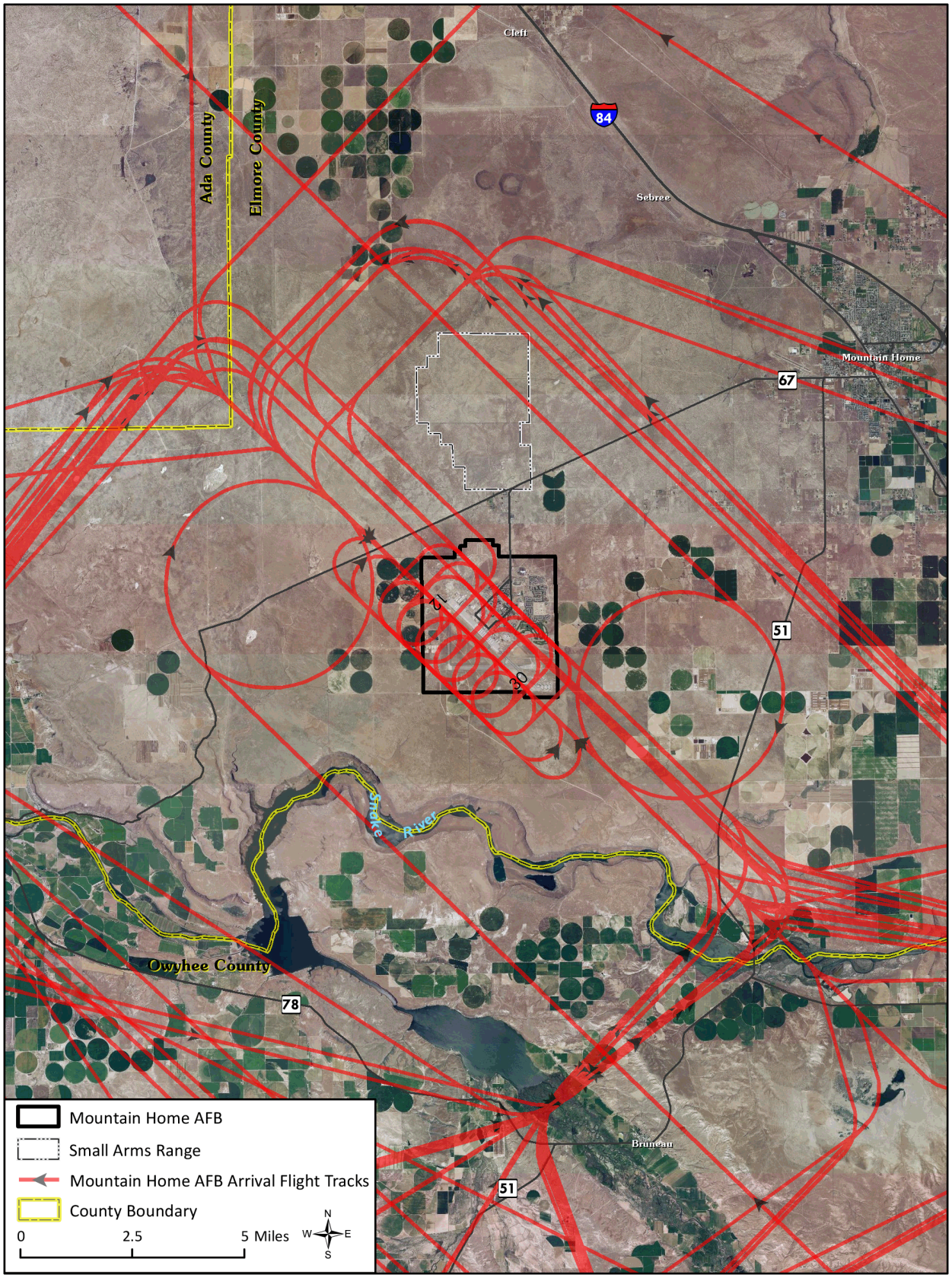


**Figure 3-3. Arrival Flight Tracks**

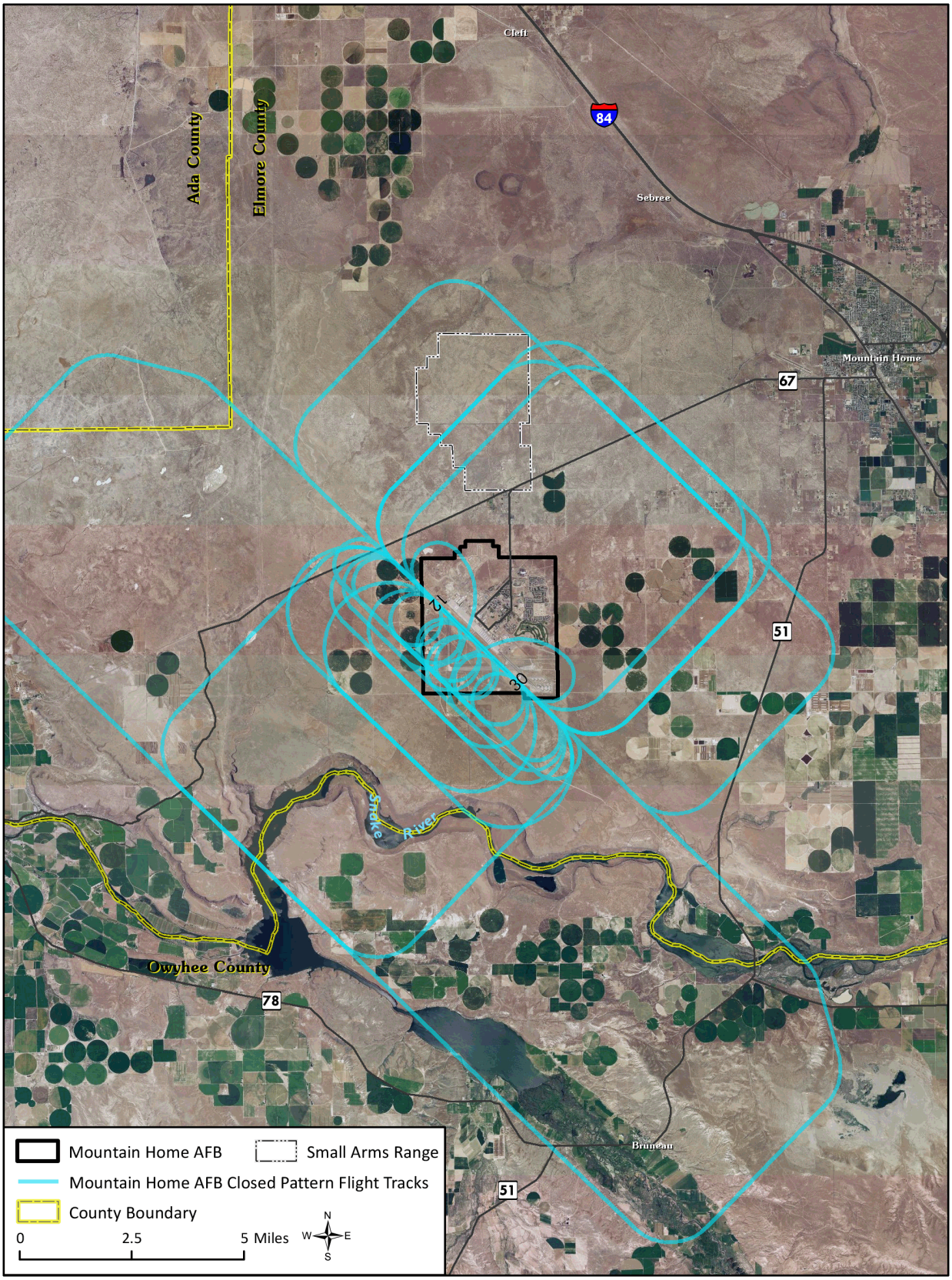


**Figure 3-4. Closed Pattern Flight Tracks**

The presence of these special use airspace units sometimes affects the routing of Mountain Home AFB-based aircraft. However, Mountain Home AFB-based aircraft are typically the aircraft for which the Mountain Home Range Complex special use airspace (e.g., R-3202, Owyhee and Jarbidge Military Operations Areas) are reserved, and so the location of the airspace units near the base is a benefit more often than it is a hindrance. The relatively uncongested airspace surrounding Mountain Home AFB means that aircrews can take the most direct route to and from their destinations, allowing them to accomplish training objectives efficiently.

## 3.6 Noise Abatement

The Air Force recognizes that noise from military operations may cause concern for people living near military installations.

For this reason, the Air Force has established a noise program aimed at reducing and controlling the emission of noise and vibrations associated with the use of military aircraft, weapon systems, and munitions while maintaining operational requirements. The result is the implementation of various strategies, techniques, and procedures that are aimed at protecting persons and structures from the harmful effects of noise and vibrations:

- Restrict late-night flying to the extent practicable while still maintaining night mission proficiency. Training for night missions is essential for aircrew success in modern combat. However, flying between 10:00 PM and 7:00 AM is minimized and makes up only approximately 6 percent of the 69,335 total flying operations conducted at Mountain Home AFB annually.
- Employ hush houses for maintenance engine runs requiring high engine power settings.

Base leadership periodically reviews flight operations and their potential impact on surrounding communities. This requirement facilitates the planning, designation, and establishment of flight tracks over sparsely populated areas as often as practicable as possible to balance operational safety and reduce noise exposure levels in surrounding communities.

## 3.7 Noise Complaints

At times, military operations may draw noise complaints. The Air Force evaluates all noise complaints to ensure future operations, where practicable, do not generate noise that is unacceptable. Concerned citizens are encouraged to contact the 366 FW (i.e., the Mountain Home AFB host unit) Public Affairs Office at (208) 828-6800 with any noise complaints. The base publishes public notices of upcoming exercises, which include increased operational tempo and noise, and events on its official website at http://www.mountainhome.af.mil.

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# 4.0 Aircraft Noise

**Terrain features, weather phenomena, man-made structures and daily life activity contribute to noise exposure.**

How an installation manages aircraft noise can play a key role in shaping an installation's relationship with the adjacent communities. Ideally, aircraft noise management is a key factor in local land use planning.

While the level of noise produced by aircraft may have a direct effect on communities in close proximity to military air installations, other factors also influence the noise impact. An airfield's layout (its buildings, parking ramps, and runways, etc.), type of aircraft, natural terrain features, weather phenomena, and daily activities all influence the levels of noise that the community experiences.

Because noise from aircraft may affect areas around the installation, the Air Force has defined noise zones using the guidance provided in the AICUZ instruction (AFI 32-7063).

## 4.1 What Is Sound/Noise?

Sound consists of vibrations in the air. A multitude of sources can generate these vibrations, including roadway traffic, barking dogs, radios, and aircraft operations.

**Sound becomes noise when it interferes with normal activities.**

We call these vibrations compression waves. Just like a pebble dropped into a pond creates ripples, the compression waves—formed of air molecules pressed together—radiate out, decreasing with distance. If these vibrations reach your eardrum, at a certain rate and intensity, you perceive it as sound. When the sound is unwanted, we refer to it as noise. Generally, sound becomes noise to a listener when it interferes with normal activities. Sound has three components: intensity, frequency, and duration.

Intensity or loudness is related to sound pressure change. As the vibrations oscillate back and forth, they create a change in pressure on the eardrum. The greater the sound pressure change, the louder it seems.

Frequency determines how we perceive the pitch of the sound. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches. Sound frequency is measured in terms of cycles per second or hertz (Hz). While the range of human hearing goes from 20 to 20,000 Hz, we hear best in the range of 1,000 to 4,000 Hz. For environmental noise we use A-weighting, which focuses on this range, to best represent human hearing. While A-weighted decibels may be written as "dBA," if it is the only weighting being discussed, the "A" is generally dropped.

*Duration* is the length of time the sound can be detected.

## 4.2 How Sound Is Perceived

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because such large numbers become awkward to use, noise is measured in decibels (dB), which uses a logarithmic scale that doubles the noise energy every 3 dB.

Figure 4-1 shows A-weighted sound levels from common sources. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB can cause discomfort inside the ear, while sound levels between 130 and 140 dB are felt as pain.

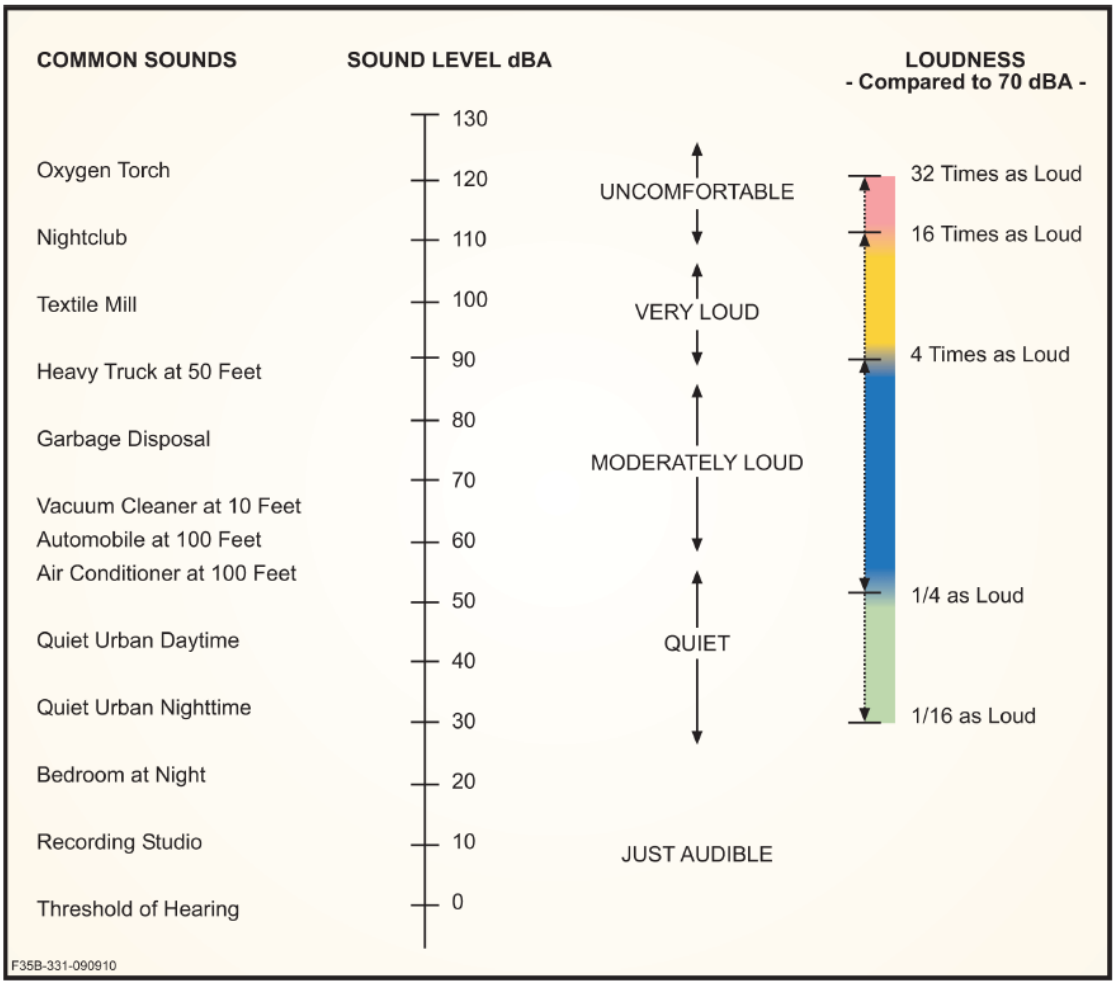


**Figure 4-1. Typical A-Weighted Levels of Common Sounds**

Table 4-1 shows the subjective responses with change in (single-event) sound level. While noise energy doubles or halves with every 3-dB change, humans do not perceive all that noise energy. It takes a 10-dB increase or decrease for the ear to perceive a doubling or halving of loudness.

**Table 4-1. Subjective Response to Changes in Sound Level**

| Change in Sound Level | Change in Loudness |
|---|---|
| 20 dB | Striking four-fold change |
| 10 dB | Dramatic two-fold or half as loud |
| 5 dB | Quite noticeable |
| 3 dB | Barely perceptible |
| 1 dB | Requires close attention to notice |

dB = decibels

## 4.3 Day-Night Average Sound Level

When we hear an aircraft fly over, the question may be asked, "How loud was that?" While we may often find ourselves concerned over the loudness of a sound, there are other dimensions to the sound event that draw our interest. For instance, does one overflight draw the same interest as two separate overflights—or as 20? Also, does the 30-second run-up of engines prior to takeoff roll draw the same interest as a 30-minute maintenance run? Additionally, is an overflight more noticeable at 2:00 in the afternoon or 2:00 in the morning, when the ambient noise is low and you are trying to sleep?

The length and number of events—the total noise energy—and the time of day play key roles in our perception of noise. To reflect these concerns, the Air Force uses a metric called the day-night average sound level (DNL). DNL was created by the U.S. Environmental Protection Agency and is used throughout the United States.

DNL, when used as a metric for aircraft noise, represents the accumulation of noise energy from all aircraft noise events in a 24-hour period. Additionally, for all operations between 10:00 PM and 7:00 AM, a penalty of 10 dB is added for each event to account for the intrusiveness of nighttime operations. As is implied in its name, the DNL represents the noise energy present in a daily period. However, because aircraft operations at military airfields fluctuate from day to day, the Air Force typically bases DNL on a year's worth of operations and represents annual average daily aircraft events.

DNL is not a level heard at any given time but represents long-term exposure. Scientific studies have found good correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL.

## 4.4 Noise Contours

The Air Force prepares noise contours, as needed, to assess the compatibility of aircraft operations. Noise contours connect points of equal value, just as contours on topographic maps connect points of equal elevation. This AICUZ Study presents the historical and future-year planning noise contours. The Air Force utilizes NOISEMAP, the DoD standard model for assessing noise exposure from military aircraft operations at air

installations. Noise contours, when overlaid on local land use maps, can help to identify areas of incompatible land uses and assist communities in planning for future development around an air installation.

### 4.4.1 Planning Contours

This AICUZ Study provides a future-year planning noise contour. Long-range planning by local land use authorities involves strategies that influence present and future uses of land. Due to the long-range nature of this planning, the Air Force provides planning contours—noise contours based on reasonable projections of future missions and operations. AICUZ studies, using planning contours, provide a description of the long-term (5 – 10 year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by state, tribal, regional, and local planning bodies.

The Air Force bases planning contours on the best available, realistic long-range projections of unclassified estimates of future mission requirements. This includes reasonable projections of future operations based on trends in operational tempo, retirement of legacy aircraft, new aircraft entering the inventory, and other factors.

These long-range projections are not commitments of future operations. Inclusion of planning contours in the AICUZ Study does not eliminate the need to conduct appropriate environmental analysis if an assumption used in the development of the planning contours becomes a proposed Air Force action.

Assumptions included in the Mountain Home AFB planning contour include

- An increase in the number of RSAF F-15SG aircraft assigned to the 428 FS from 16 to 20.

Projected operations for the Mountain Home AFB planning contour, including the increase in the number of aircraft assigned to 428 FS, are listed in Table 3-1.

### 4.4.2 Mountain Home AFB Noise Contours

The 2018 Mountain Home AFB AICUZ noise contours, which are based on the planning scenario described above, are shown in Figure 4-2. The 65-dB DNL contour extends along the extended runway centerline for approximately 3 miles to the northwest of the base boundary and about the same distance to the southeast of the base boundary. Closed pattern maneuvers are typically conducted to the south of the runway, and the 65-dB DNL contour reflects frequently used closed pattern flight tracks with bulges toward the south.

Figure 4-3 shows a comparison of the 2018 and the 1998 AICUZ noise contours. In the 20 years since publication of the 1998 AICUZ Study, there have been multiple mission changes, improvements in computer noise modeling technology, and changes in Air Force land use planning policy. Changes are summarized below:

- **Changes in based aircraft.** The 1998 AICUZ noise contours reflect the operations of a “composite wing” that included three types of fighter aircraft (F-15C, F-15E,

and F-16) as well as a bomber (B-1) and a tanker (KC-135R). The installation currently supports Air Force F-15E and RSAF F-15SG fighter aircraft.

- **Changes in operational practices.** Flight paths used at Mountain Home AFB are determined primarily by the most expeditious path to and from training locations. However, flight paths have been adjusted in the 20 years since the 1998 AICUZ reflecting new or revised local flight guidance (e.g., new aircraft waypoints). Multi-aircraft formations returning to Mountain Home AFB now sometimes follow a procedure in which aircraft approach the runway side-by-side at high speed with the wingman offset from the runway centerline by about 1 nautical mile. This procedure, which minimizes the time during which aircraft are exposed to ground-based threats, has become increasingly common as aircrews prepare for operations in environments where ground-based threats are a possibility anywhere outside of the installation perimeter.
- **Changes in noise modeling software.** The noise modeling software NOISEMAP now accounts for the effects of topography on sound transmission, but this technology was not available in 1998. The terrain near Mountain Home AFB consists mostly of gently rolling hills. As there are no steep mountain slopes or deep valleys in the immediate vicinity of Mountain Home AFB, the effects of terrain on noise propagation are relatively minor.
- **Changes in AICUZ Air Force policies.** Since 1998, DoD and Air Force have shifted to use of an average annual day rather than an average busy day in representing noise for land use planning. The average annual day matches more closely with the noise levels on which DNL-annoyance social survey results are based. Use of the average annual day also allows greater standardization of noise results across installations.

Table 4-2 lists the off-base land acreage and estimated population within the planning contours. The off-base area exposed to a minimum of 65 dB DNL includes approximately 10,190 acres. Approximately 52 percent of the off-base area exposed to greater than 65 dB DNL is within 65–69 dB DNL, 31 percent is within 70–74 dB DNL, 15 percent is within 75–79 dB, 3 percent is within 80–84 dB DNL, and less than 1 percent is within 85–89 dB DNL. Land use classification and aerial photography indicate there are no residences (or residents) within the off-base area affected by noise levels above 65 dB DNL.

**Table 4-2. Off-Base Land Area and Estimated Population Within Noise Zones for the 2018 AICUZ Noise Contours**

| Noise Zone (dB DNL) | Acres | Population |
|---|---|---|
| 65–69 | 5,309.3 | 0 |
| 70–74 | 3,109.2 | 0 |
| 75–79 | 1,493.3 | 0 |
| 80–84 | 276.0 | 0 |
| 85+ | 2.2 | 0 |
| **Total (65+)** | **10,190.0** | **0** |

dB = decibels; DNL = day-night average sound level

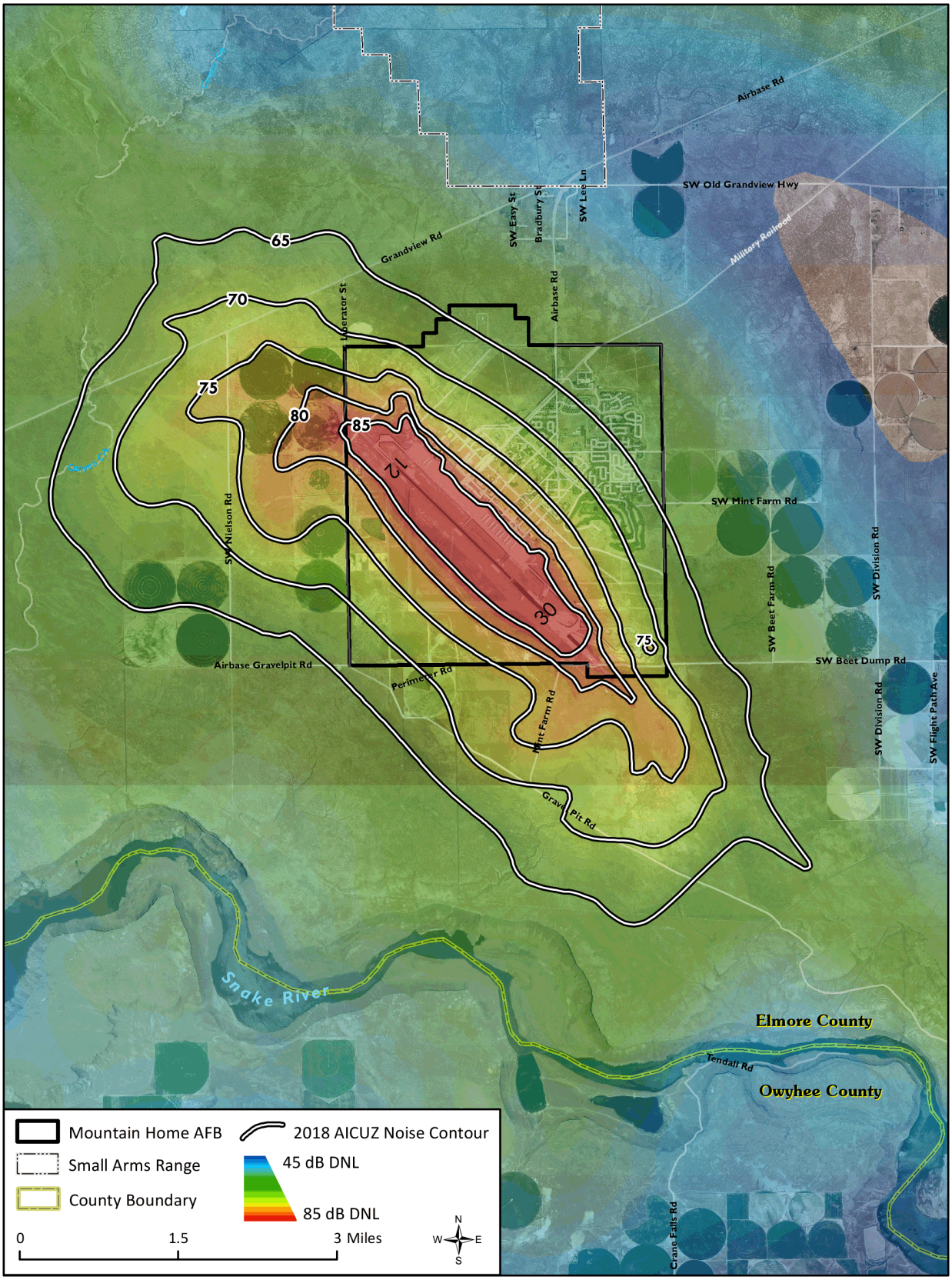


**Figure 4-2. 2018 AICUZ Noise Contours with Gradient Shading**

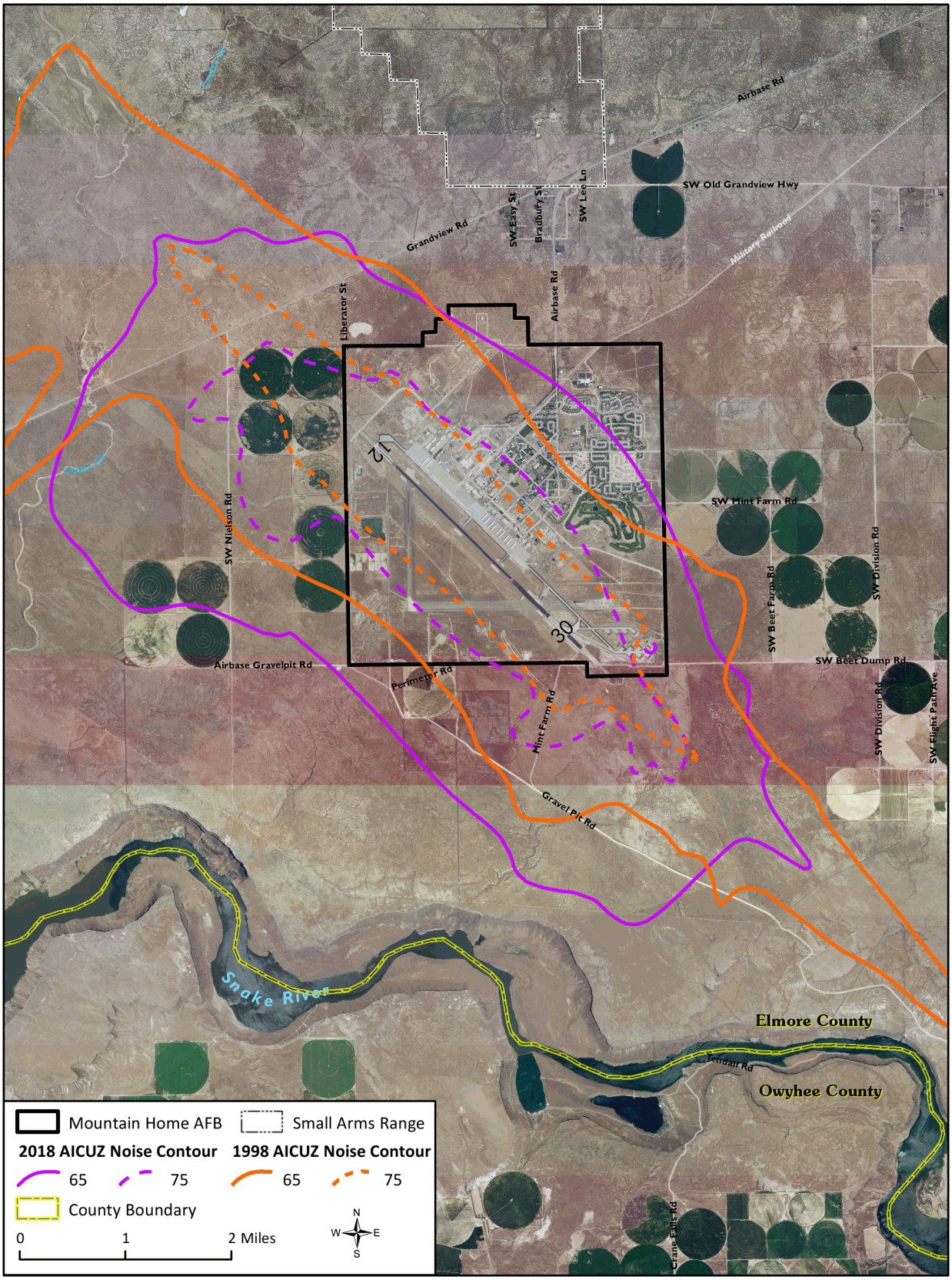


**Figure 4-3. Comparison of 2018 and 1998 AICUZ Noise Contours**

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# 5.0 Community and Aircraft Safety

Safety is paramount to both the Air Force and the community, with each playing a vital role in its success. Cooperation between the Air Force and the community results in strategic and effective land use planning and development. As such, the Air Force has established a flight safety program and has designated areas of accident potential around its air installations to assist in preserving the health, safety, and welfare of residents living near the airfield. This AICUZ Study provides the information needed, in part, to reach this shared safety goal.

Identifying safety issues assists the community in developing land uses compatible with airfield operations. As part of the AICUZ Program, the Air Force defines areas of accident potential, imaginary surfaces, and hazards to flight.

Section 5.1 discusses CZs and APZs. Section 5.2 presents the imaginary surfaces and Section 5.3 discusses the zones associated with hazards to aircraft flight.

## 5.1 Clear Zones and Accident Potential Zones

In the 1970s and 1980s, the military conducted studies of historical accident and operations data throughout the military. The studies showed that most aircraft mishaps occur on or near the runway, diminishing in likelihood with distance from the runway. Based on these studies, the DoD identified CZs and APZs as areas where an aircraft accident is most likely to occur if an accident were to take place—these zones are not predictors of accidents. The studies identified three areas that, because of accident potential, should be considered for density and land use restrictions: the CZ, APZ I, and APZ II. The CZs and APZs are described in the bullets below and are shown on Figure 5-1.

- **Clear Zone.** At the end of all active Air Force runways is an area known as the "Clear Zone." The CZ is a square area beyond the end of the runway and centered on the runway centerline, extending outward for 3,000 feet. A CZ is required for all active runways and should remain undeveloped.

- **APZ I.** Beyond the CZ is APZ I. APZ I is 3,000 feet wide and 5,000 feet long along the extended runway centerline.

- **APZ II.** APZ II is the rectangular area beyond APZ I. APZ II is 3,000 feet wide by 7,000 feet long along the extended runway centerline.

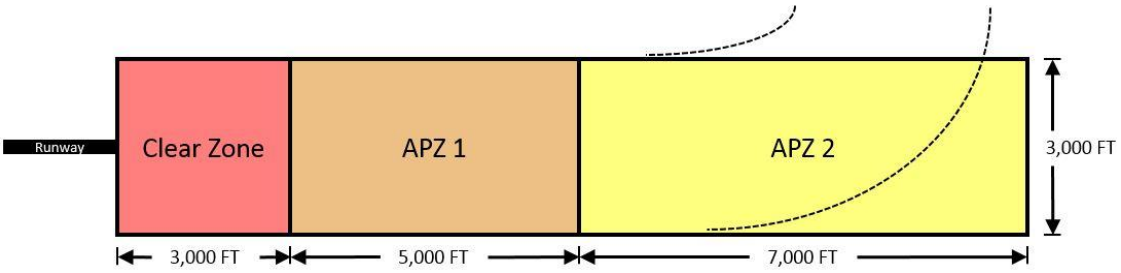



**Figure 5-1. Runway Clear Zones and Accident Potential Zones**

While the APZs extend outward from the ends of the runway along the extended runway centerline, the base may add a curved APZ where over 80 percent of the operations follow a curved departure.

Within the CZ, most uses are incompatible with military aircraft operations. For this reason, it is the Air Force's policy, where possible, to acquire real property interests in land within the CZ to ensure incompatible development does not occur. Within APZ I and APZ II, a variety of land uses are compatible; however, higher-density uses (e.g., schools, apartments, churches) should be restricted because of the greater safety risk in these areas. Chapter 6 discusses land use and recommendations for addressing incompatibility issues within APZs for each airfield. Figure 5-2 depicts the CZs and APZs for Runways 12 and 30 at Mountain Home AFB.

Table 5-1 tabulates the off-base land acreage and estimated population within the CZs and APZs. The Air Force does not own the 115.8 acres of CZs. However, there are no residences within this area. Off-base areas within APZ I include 659.8 acres, and off-base areas within APZ II affect 964.2 acres. However, no residences are located in these areas, and there is no affected population.

**Table 5-1. Off-Base Land Area and Estimated Population Within the Clear Zones and Accident Potential Zones**

| Zone | Acres | Population |
|---|---|---|
| CZ | 115.8 | 0 |
| APZ I | 659.8 | 0 |
| APZ II | 964.2 | 0 |
| **Total** | **1,739.8** | **0** |

APZ = Accident Potential Zone; CZ = Clear Zone

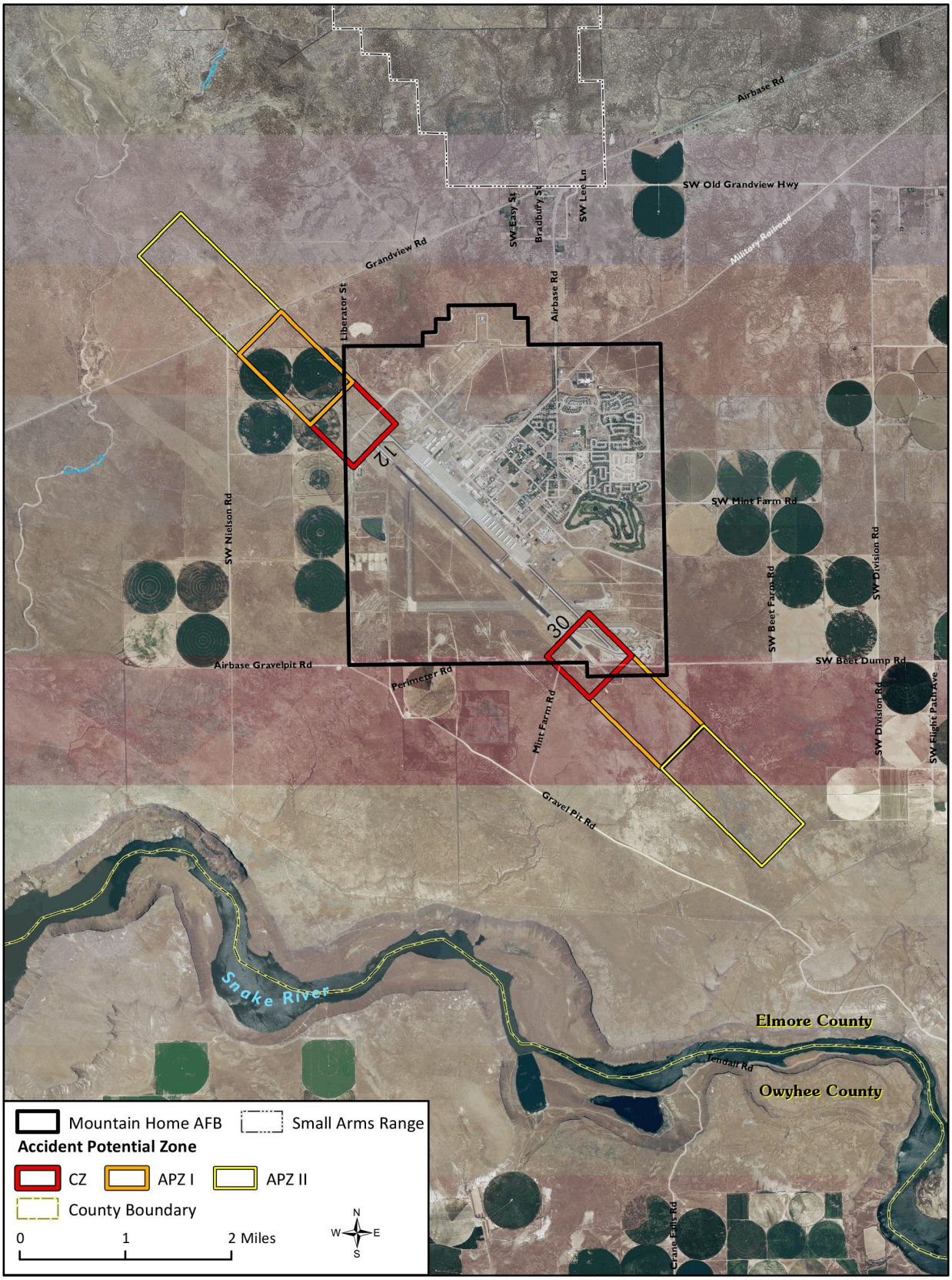
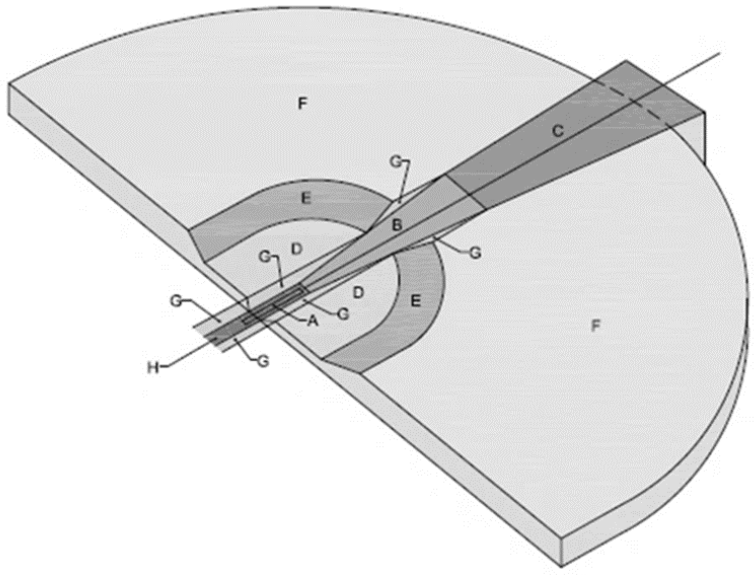



**Figure 5-2. 2018 AICUZ Clear Zones and Accident Potential Zones for Mountain Home AFB**

## 5.2 Imaginary Surfaces

DoD and the Federal Aviation Administration (FAA) identify a complex series of imaginary planes and transition surfaces that define the airspace needed to remain free of obstructions around a military airfield. Obstruction-free imaginary surfaces ensure safe flight approaches, departures, and pattern operations. Obstructions include natural terrain and man-made features, such as buildings, towers, poles, wind turbines, cell towers, and other vertical obstructions to airspace navigation.

Brief descriptions of the imaginary surfaces for fixed-wing runways are provided on Figure 5-3 and in Table 5-2. Figure 5-4 depicts the runway airspace imaginary surfaces specific to Mountain Home AFB. In general, the Air Force does not permit above-ground structures in the primary surface, and height restrictions apply to transitional surfaces and approach and departure surfaces. Height restrictions are more stringent the closer an aircraft is to the runway and flight paths.




LEGEND

A Runway
B Approach-Departure Clearance Surface (50:1 Slope Ratio)
C Approach-Departure Clearance Surface (Horizontal)
D Inner Horizontal Surface (45.72m [150'] Elevation)
E Conical Surface (20:1 Slope Ratio)
F Outer Horizontal Surface (152.40m [500'] Elevation
G Transitional Surface (7:1 Slope Ratio)
H Primary Surface

**Figure 5-3. Runway Imaginary Surfaces and Transition Planes**

**Table 5-2. Description of Imaginary Surfaces for Military Airfields**

| | |
|---|---|
| **Primary Surface** | An imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements in the vicinity of the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline. |
| **Approach-Departure Clearance Surface** | This imaginary surface is symmetrically centered on the extended runway centerline, beginning as an inclined plane (glide angle) at the end of the primary surface (200 feet beyond each end of the runway) and extending for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the starting point. The width of this surface at the runway end is 2,000 feet, flaring uniformly to a width of 16,000 feet at the end point. |
| **Inner Horizontal Surface** | This imaginary surface is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents. |
| **Conical Surface** | This is an inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces. |
| **Outer Horizontal Surface** | This imaginary surface is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet. |
| **Transitional Surface** | This surface extends outward and upward at right angles to the runway centerline and extended runway centerline at a slope of 7:1. The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, conical, and outer horizontal surfaces. |

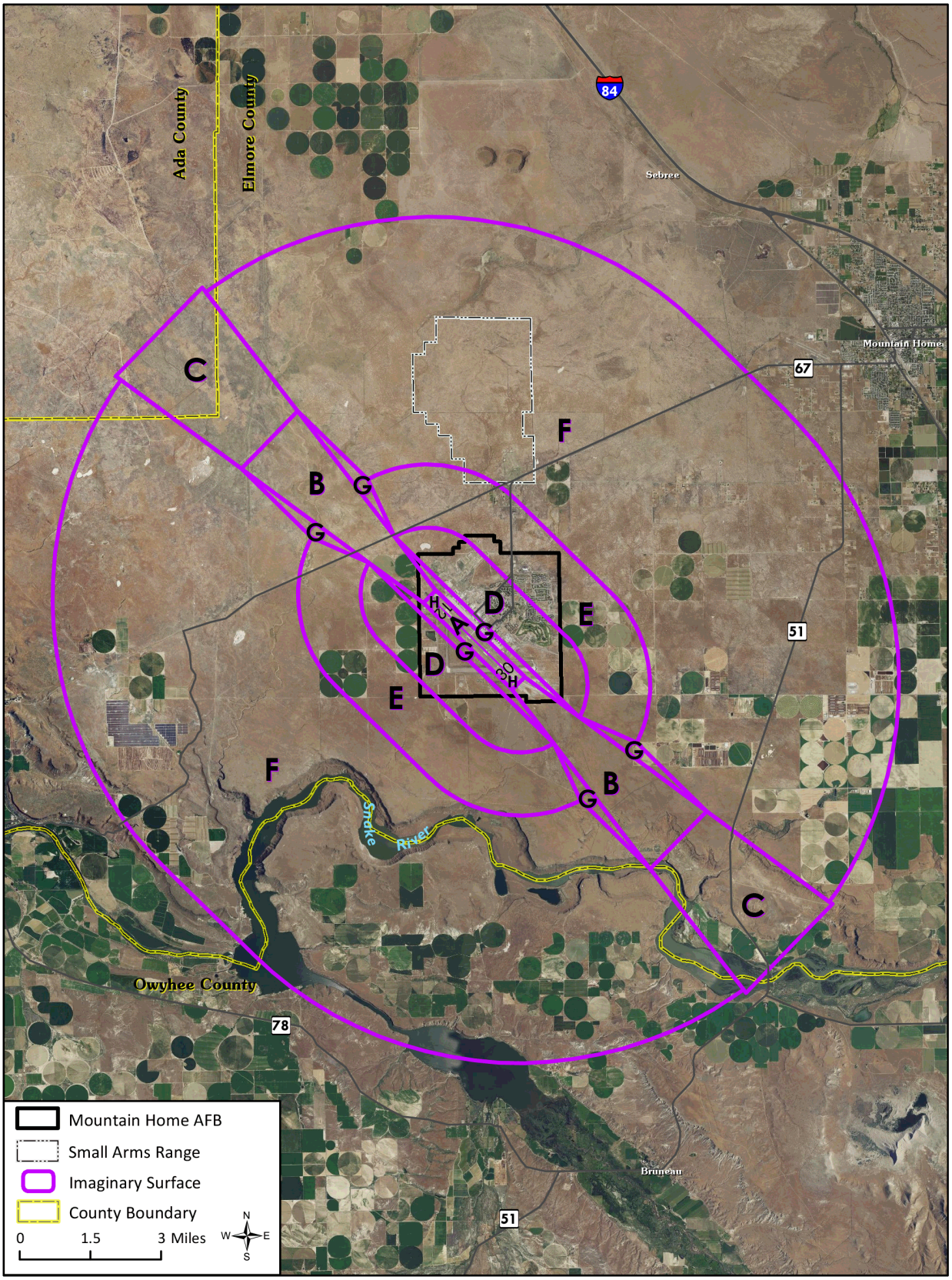



**Figure 5-4. Runway Airspace Imaginary Surfaces and Transition Planes for Mountain Home AFB**

## 5.3 Hazards to Aircraft Flight Zone

Certain land uses and activities can pose potential hazards to flight. To ensure land uses and activities are examined for compatibility, the Air Force has identified a Hazards to Aircraft Flight Zone (HAFZ). The HAFZ is defined as the area within the "imaginary surfaces" shown in Figure 5-4. Unlike noise and safety zones, there are no recommended land use compatibility tables for the HAFZ. Land in the HAFZ should be evaluated for compatibility, and it is recommended that project applicants and local planning bodies consult with the Air Force to ensure the project is compatible with Air Force operations. The following should be considered:

- **Height:** Tall objects can pose significant hazards to flight operations or interfere with navigational equipment (including radar). City/county agencies involved with approvals of permits for construction should require developers to submit calculations that show projects meet the height restriction criteria of Title 14 Code of Federal Regulations (CFR) Part 77.17 for the specific airfield described in an AICUZ study. City and county agencies may also consider requiring a "Determination of No Hazard" issued by the FAA for any tall objects within this zone.
- **Visual interference:** Industrial or agricultural sources of smoke, dust, and steam in the airfield vicinity can obstruct the pilot's vision during takeoff, landing, or other periods of low-altitude flight. Close coordination between the base and the landowner can often mitigate these concerns. For example, irrigating before plowing can greatly reduce dust.
- **Light emissions:** Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot or "halo" to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous for pilots at night, when the flash can diminish the eye's adaptation to darkness. The eyes partially recover from this adaptation in a matter of minutes, but full adaptation typically requires 40 to 45 minutes. Specific examples of light emissions that can interfere with the safety of nearby aviation operations include:
    - Lasers that emit in the visible spectrum can be potentially harmful to a pilot's vision during both day and night.
    - The increasing use of energy-efficient light-emitting diode (LED) lights also poses potential conflicts in areas where pilots use night vision goggles (NVGs). NVGs can exaggerate the brightness of these lights, interfering with pilot vision.
    - The use of red LED lights to mark obstructions can produce an unintended safety consequence because red LED lights are not visible on most NVG models, rendering them invisible to NVG users in the area.

- **Bird/wildlife-aircraft strike hazard:** Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to different habitat types found in the airfield environment, including hedges, grass, brush, forest, water, and even the warm pavement of the runways. Although most bird and animal strikes do not result in crashes, they cause structural and mechanical damage to aircraft as well as loss of flight time. Most collisions occur when the aircraft is at an elevation of less than 1,000 feet. Due to the speed of the aircraft, collisions with wildlife can happen with considerable force.

  To reduce the potential of a bird/wildlife-aircraft strike hazard (BASH), the Air Force recommends that land uses that attract birds not be located near installations with an active air operations mission. These land uses include the following:

  - Waste disposal operations
  - Wastewater treatment facilities
  - Transfer stations
  - Landfills
  - Golf courses
  - Wetlands
  - Stormwater ponds
  - Dredge disposal sites

  Birds and raptors in search of food or rodents will flock to landfills, increasing the probability of BASH occurrences in the vicinity of these facilities. Design modifications also can be used to reduce the attractiveness of these types of land uses to birds and other wildlife.

  Due to the base and surrounding area habitat, location of the Birds of Prey National Conservation Area (NCA), and the irrigated agriculture land adjacent to the base, the area attracts a wide variety of wildlife, such as coyotes and badgers, birds of all sizes, and small ground nesting birds. The primary BASH threats to the Mountain Home AFB are birds that congregate at the water retention and treatment ponds located 350 yards west-northwest of the north end of the runway, and the presence of coyotes on the base. The Birds of Prey NCA extends northwest from the Saylor Creek Range, along the Snake River corridor and adjacent uplands for 80 miles, surrounding Mountain Home AFB. This area contains the highest concentration of nesting raptors in North America. Known nesting activities occur along the cliffs of the Snake River canyon, and foraging occurs in the adjacent uplands, including around Mountain Home AFB and the Mountain Home Range Complex.

  The presence of the runway so near the ponds creates hazards to aircraft and crew, and current flight patterns avoid the north side of the runway due to the

base buildings. This places the patterns south of the runway, where the ponds pose a continual BASH threat at all times.

- **Radio frequency/electromagnetic interference:** The American National Standards Institute defines electromagnetic interference (EMI) as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. EMI may be caused by atmospheric phenomena, such as lightning or precipitation static, and by non-telecommunications equipment, such as vehicles and industrial machinery.

New generations of military aircraft are highly dependent on complex electronic systems for navigation and critical flight and mission-related functions. Consequently, communities should use care when siting any activities that create EMI. Many of these sources are low-level emitters of EMI. However, when combined, they have an additive quality.

EMI also affects consumer devices, such as cell phones, FM radios, television reception, and garage door openers. In some cases, the source of interference occurs when consumer electronics use frequencies set aside for military use.

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# 6.0 Land Use Analysis

The AICUZ area of influence or the "AICUZ footprint" of an airfield is the combination of noise contours, CZs, APZs, and the HAFZ and is used as the basis for the land use compatibility analysis. The AICUZ footprint defines the minimum recommended area within which land use controls are needed to enhance the health, safety, and welfare of those living or working near a military airfield and to preserve the flying mission. The AICUZ footprint, combined with the guidance and recommendations set forth in the AICUZ Study, are the fundamental tools necessary for the planning process. The Air Force recommends local and regional governments adopt the AICUZ noise zones, CZs, APZs, and HAFZ into planning studies, regulations, and processes to best guide compatible development around the installation. As the basis for the land use compatibility analysis, this study uses the AICUZ footprint with imaginary surfaces as the largest component (see Figure 5-4) for Mountain Home AFB.

## 6.1 Land Use Compatibility Guidelines and Classifications

In an effort to establish long-term compatibility for lands within the vicinity of military air installations, DoD has created land use compatibility recommendations based on the Federal Highway Administration's Standard Land Use Coding Manual. These guidelines are used by DoD personnel for on-base planning and for engaging with the local community to foster compatible land use development. Table A-1 of Appendix A lists the suggested land use compatibility guidelines within the CZs and APZs. Table A-2 of Appendix A provides land use compatibility recommendations within noise contours.

## 6.2 Planning Authorities

This section presents information for each of the governing bodies having land-use jurisdictions near Mountain Home AFB, including descriptions of existing and future land uses.

The primary land use planning jurisdiction in the immediate vicinity of Mountain Home AFB is Elmore County. Land use decisions are presided over by the Elmore County Planning and Zoning Commission; the commission's recommendations are forwarded to the County Board of Commissioners for final approval. The Elmore County Planning and Zoning Commission is composed of eight board members, and the Elmore County Board of Commissioners is composed of three members. The county has a 2014 Comprehensive Plan that guides development with the county. With a substantial percentage of the county currently devoted to farming or timber production, lands surrounding Mountain Home AFB can be classified as open/agricultural/low density.

The nearest incorporated area, the city of Mountain Home, lies about 10 miles east of the base. It operates with a mayor and city council format. The city council has four members. The city of Mountain Home also has a Planning and Zoning Commission, consisting of seven members appointed by the mayor and confirmed by the council.

Planning and zoning regulations for the city are administrated by staff from the Public Works Department.

## 6.3 Land Use and Proposed Development

The land use compatibility analysis identifies existing and future land uses near Mountain Home AFB to determine compatibility conditions. Existing land use is assessed to determine current land use activity, while future land plans are used to project development and potential growth areas. Existing land use and parcel data provided by Elmore County were evaluated to ensure an actual account of land use activity regardless of conformity to zoning classification or designated planning or permitted use. Additionally, local management plans, policies, ordinances, and zoning regulations were evaluated to determine the type and extent of land use allowed in specific areas.

### *6.3.1 Existing Land Uses*

Mountain Home AFB is located in Elmore County, where public ownership accounts for about 73 percent of the land in the county. Private lands account for about 27 percent. There are approximately 1,971,200 acres of land in the county; more than 6 percent of Elmore County land, or 120,355 acres, is state owned, and 1,327,041 acres are federally owned.

Existing land uses within the 2018 AICUZ noise contours and APZs at Mountain Home AFB are illustrated on Figure 6-1 and Figure 6-2, respectively. The predominant land uses within the 2018 AICUZ noise contours and APZs are open/agriculture/low density uses. There are a few residential structures approximately 1.4 miles north of the main gate. There are isolated areas of commercial development along Airbase Road, State Highway 67, between the base boundary and the western extent of the city of Mountain Home. Major population concentrations lie more than 10 miles to the east of the base in the city of Mountain Home.

Managed by the Bureau of Land Management, the Morley Nelson Snake River Birds of Prey NCA includes 600,000 acres of land along the Snake River corridor and adjacent uplands. The area, shown on Figure 6-1 and Figure 6-2, also encompasses Mountain Home AFB and the Small Arms Range. The area provides habitat for 24 different raptor species. Table 6-2 summarizes the total acreage of land uses within the 2018 AICUZ APZs and noise zones. Areas of specific land use compatibility concerns within the APZs and noise contours are further evaluated in Section 6.4, Compatibility Concerns.

### *6.3.2 Current Zoning*

Zoning is the legal regulation of property use to protect the health, safety, and welfare of citizens; protect property rights; conserve resources; and avoid incompatible uses. In Idaho, counties and cities enact zoning ordinances to implement respective comprehensive plan objectives.

Current zoning data for the area surrounding Mountain Home AFB were gathered from the Elmore County offices responsible for the enforcement of zoning ordinances. Much of the land surrounding the base is zoned for agriculture. These lands can contain areas of productive irrigated croplands, grazing lands, forestland, mining lands, and public lands as well as rangeland and ground of lesser agricultural value. In July 1974, Elmore County additionally addressed the area surrounding Mountain Home AFB by establishing an Air Base Hazard Zone, which regulates and restricts heights of structures and property uses in the vicinity of airports within the county. The ordinance (Title 6, Chapter 36) also establishes sub-zones that address all lands lying within the noise hazard zones and the instrument approach zone, non-instrument approach zone, visual approach zone, horizontal zone, and conical zone (Elmore County, 2014). The ordinance also establishes an Air Base Commercial Zone, which generally is located on either side of Highway 67 (Airbase Road) from the main gate north to Grandview Road.

Land use permitted within the Air Base Hazard Zone is agricultural, although single-family homes may be built on lots that were in existence prior to July 22, 1974. Land development in the Air Base Commercial Zone must meet specific uses, and a minimum lot size of 5 acres is required with one business establishment per each 5-acre lot. Specific signage and lighting standards have been established to reduce height and visual interferences with airfield operations at Mountain Home AFB. The ordinance also specifies that a proposed land use cannot create electrical interference with navigational signals or radio communications between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, result in glare in the eyes of pilots using the airport, or impair visibility in the vicinity of landing, takeoff, or maneuvering of aircraft intending to use the airport (Elmore County, 2014).

Figure 6-3 illustrates the zoning and AICUZ noise contours in the areas surrounding Mountain Home AFB. Figure 6-4 presents the zoning within the Mountain Home AFB's CZs and APZ I and II.

For AICUZ planning purposes, similar zoning categories were consolidated into the seven generalized categories as discussed in upcoming Section 6.4. See Appendix A for additional details.

### *6.3.3 Future Land Use*

Future land use data were provided by reviewing the Comprehensive Plan for Elmore County. For AICUZ planning purposes, similar land use categories were consolidated into the seven generalized categories as discussed in Section 6.4. See Appendix A for additional details.

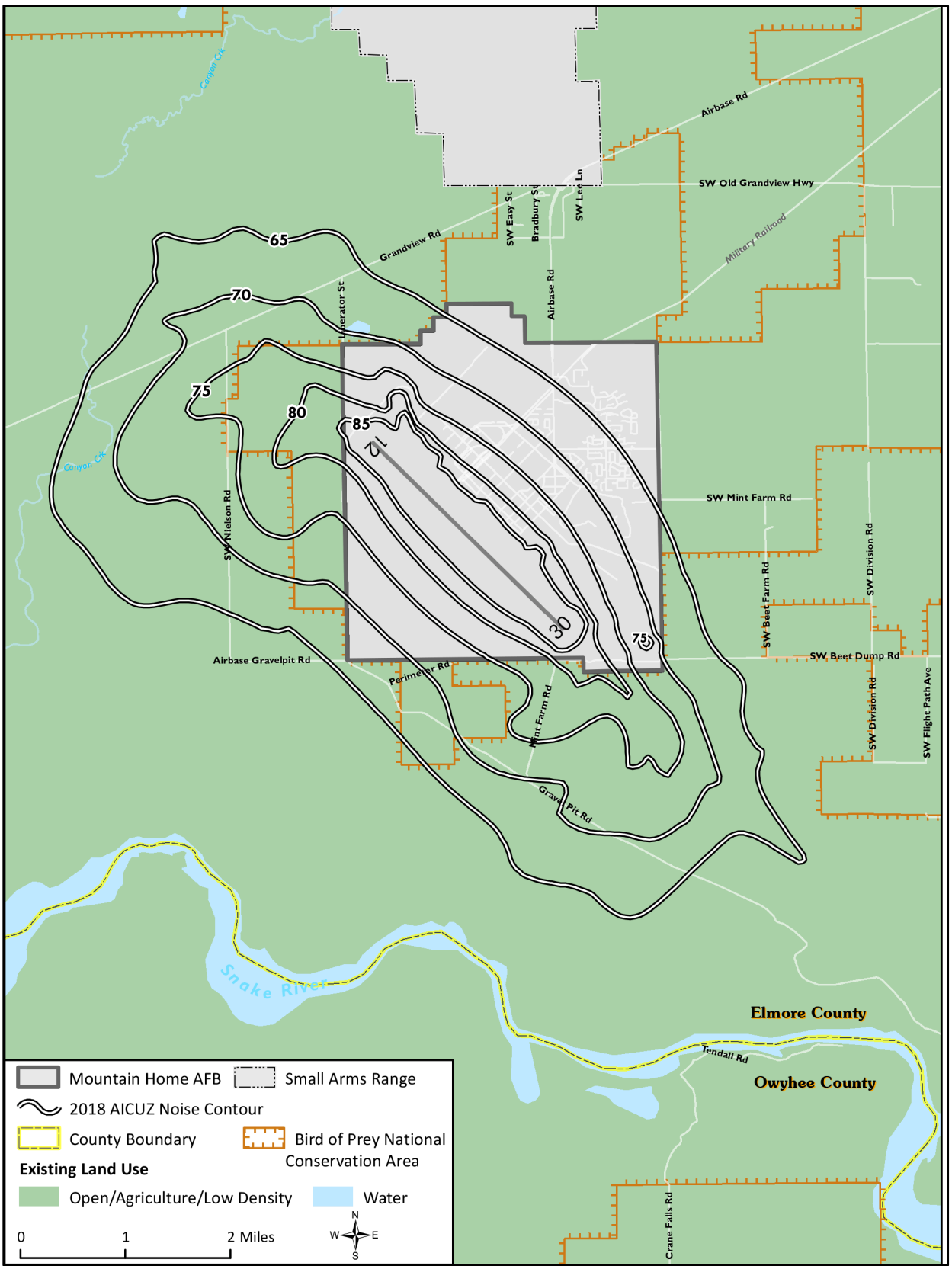


**Figure 6-1. Existing Land Use and 2018 AICUZ Noise Contours**

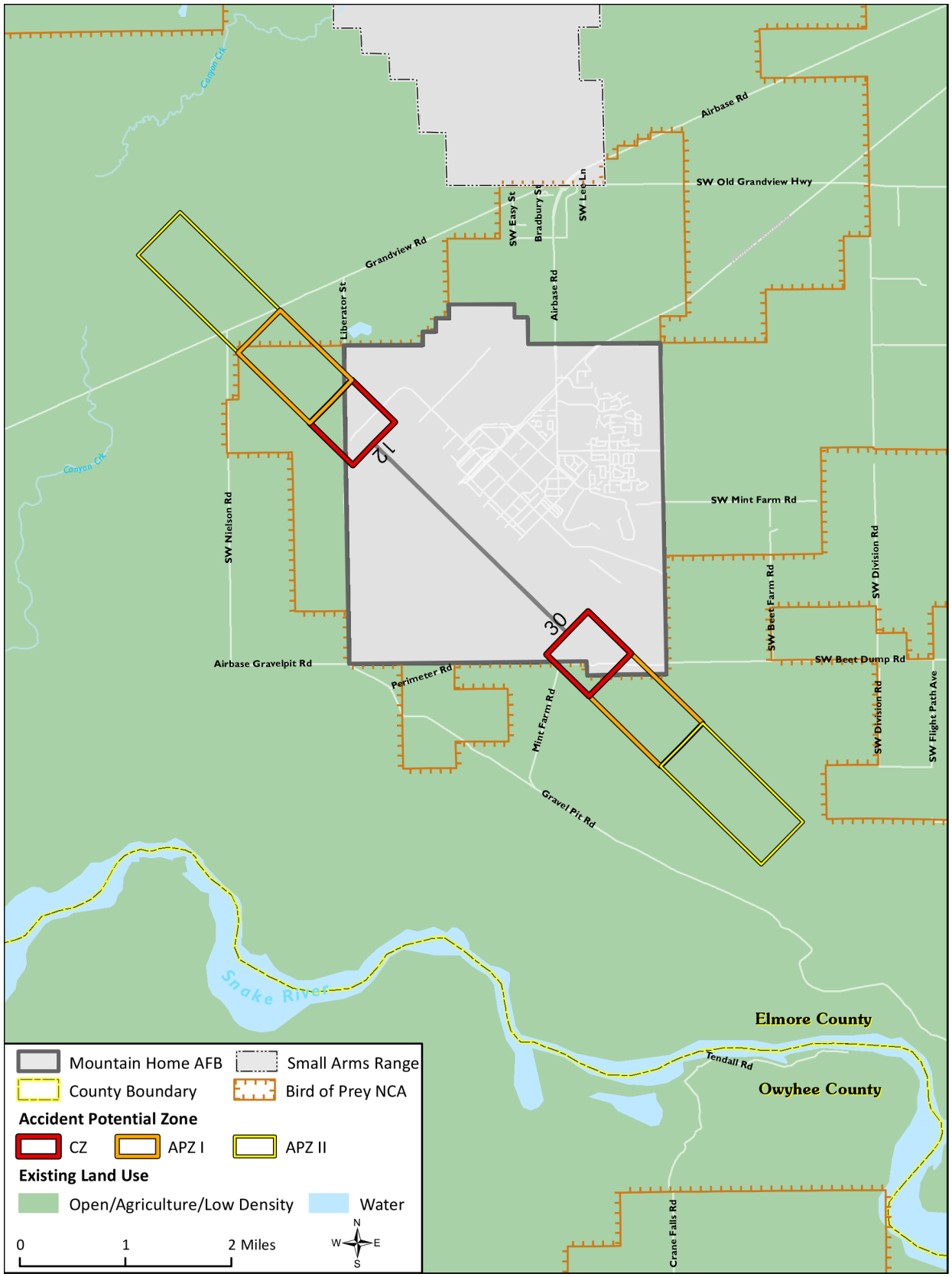


**Figure 6-2. Existing Land Use and 2018 AICUZ Clear Zones and Accident Potential Zones**

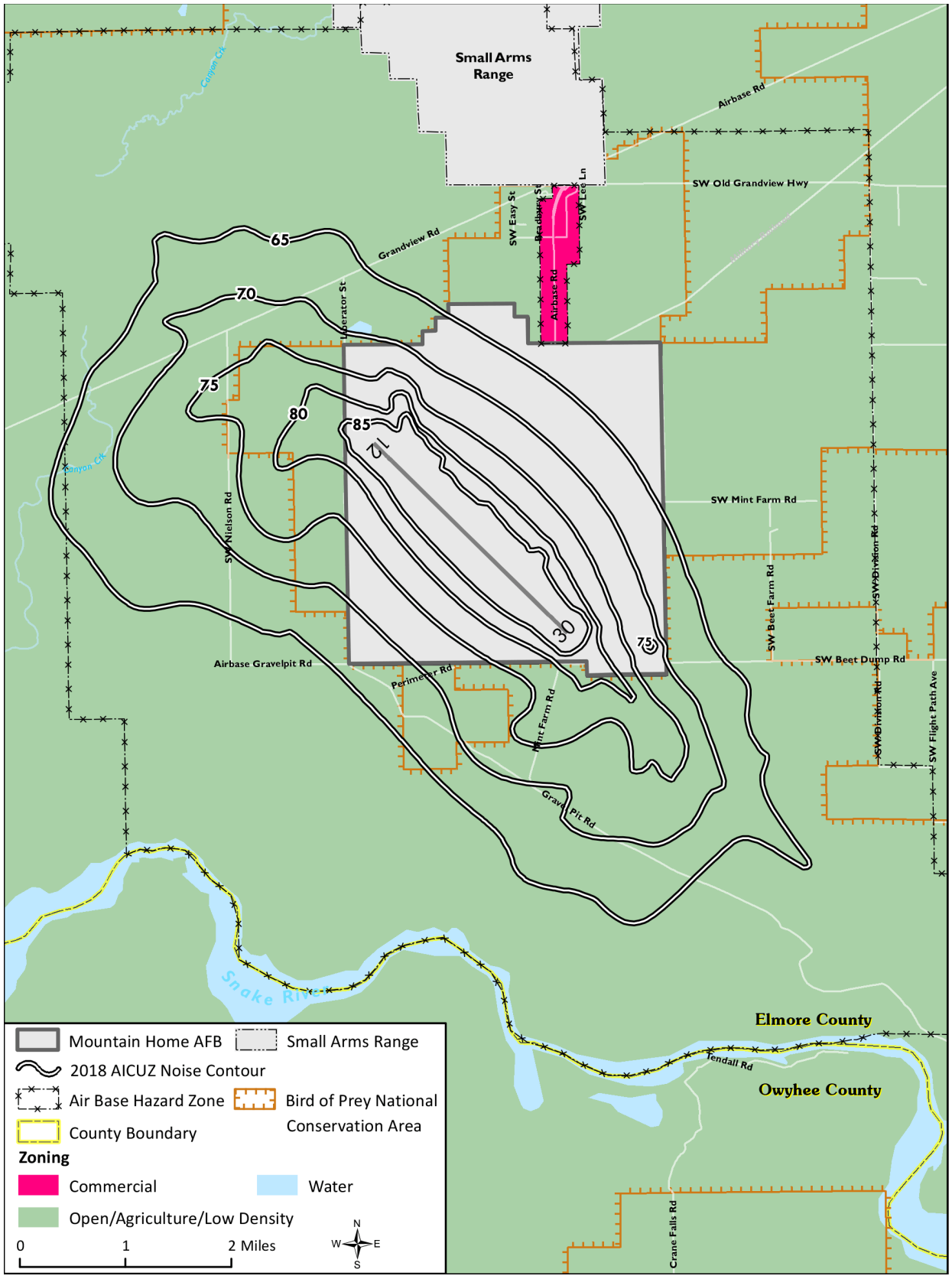


**Figure 6-3. Existing Zoning and 2018 AICUZ Noise Contours**

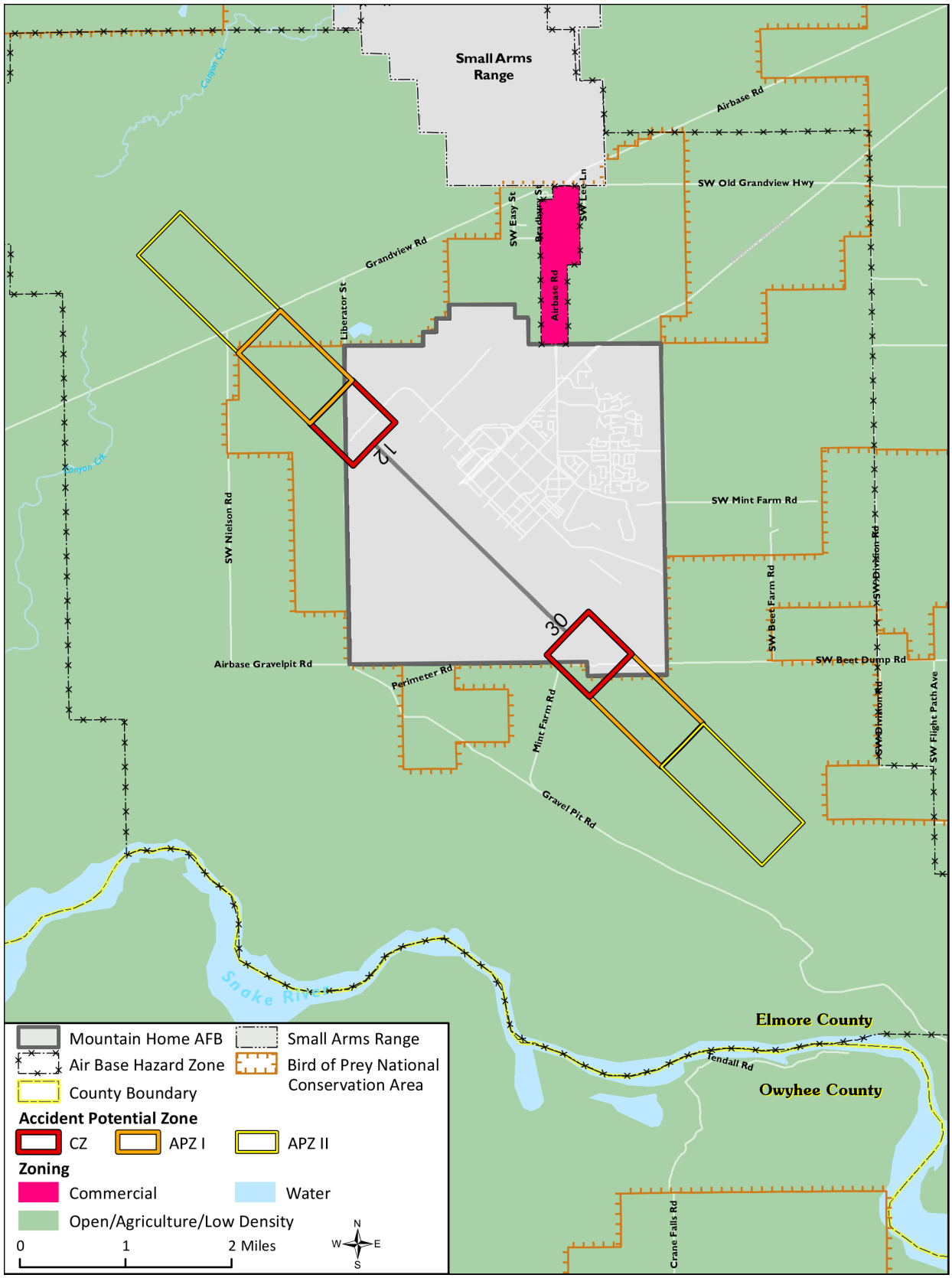


**Figure 6-4. Existing Zoning and Clear Zones and Accident Potential Zones**

## 6.4 Compatibility Concerns

### *6.4.1 Land Use Analysis*

*Land use* describes how land is developed and managed and is characterized by the dominant function occurring within an area. To compare land use consistently across jurisdictions, this analysis uses generalized land use classifications illustrating land use compatibility across common land use types. These generalized land use categories do not exactly represent the local community's land use designations but combine similar uses into the one of the following seven categories:

- **Residential:** All types of residential activity, such as single and multi-family residences and mobile homes, at a density greater than one dwelling unit per acre
- **Commercial:** Offices, retail stores, restaurants, and other types of commercial establishments
- **Industrial:** Manufacturing, warehouses, and other similar uses
- **Public/quasi-public:** Publicly owned lands and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals
- **Recreational:** Land areas designated for recreational activity, such as parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.
- **Open/agriculture/low density:** Undeveloped land areas, agricultural areas, grazing lands, and areas with residential activity at densities less than or equal to one dwelling unit per acre
- **Undesignated:** Applies to parcels that had no indicated value or were listed as "undesignated" in the original datasets

For purposes of this analysis, the DoD AICUZ compatibility guidelines (Tables A-1 and A-2 of Appendix A) have been consolidated into the above seven generalized land use classifications. Table 6-1 provides generalized compatibility guidelines. Land use compatibility falls into one of four categories: (1) compatible, (2) compatible with restrictions, (3) not compatible, and (4) not compatible with exceptions. The conditionally compatible land use categories, i.e., Categories 2 and 4 may require incorporation of noise attenuation measures into the design and construction of structures and further evaluation to be considered "compatible" and density limitations for land in APZs.

**Table 6-1. Generalized Land Use Categories and Noise/Safety Compatibility**

| Generalized Land Use Category[1] | Noise Zone (dB DNL) | | | | | | CZ | APZ I | APZ II |
|---|---|---|---|---|---|---|---|---|---|
| | <65 | 65–69 | 70–74 | 75–79 | 80–84 | 85+ | | | |
| Residential | Yes | No[2] | No[2] | No | No | No | No | No | No |
| Commercial | Yes | Yes | Yes[3] | Yes[3] | No | No | No | Yes[3] | Yes[3] |
| Industrial | Yes | Yes | Yes | Yes | Yes[3] | No | No | Yes[3] | Yes[3] |
| Public/quasi-public | Yes | Yes[3] | Yes[3] | Yes[3] | No | No | No | No | Yes[3] |
| Recreation | Yes | Yes[3] | Yes[3] | No | No | No | No | Yes[3] | Yes[3] |
| Open/agriculture/low density | Yes | Yes[3] | Yes[3] | Yes[3] | Yes[3] | Yes[3] | No | Yes[3] | Yes[3] |
| Undesignated | Yes | No | No | No | No | No | No | No | No |

< = less than; + = and above; APZ = Accident Potential Zone; CZ = Clear Zone; dB = decibels; DNL = day-night average sound level

1. Refer to Appendix A for details.
2. Incompatible with exceptions.
3. Compatible with restrictions.

## *6.4.2 Existing Land Use Compatibility Concerns*

Existing land use compatibility acreages for areas exposed to DNL greater than or equal to 65 dB for Mountain Home AFB are listed in Table 6-2. CZ and APZ related land use acreages are listed in Table 6-3. Figure 6-5 shows the location of all existing land uses incompatible with the AICUZ planning contours and the CZs and APZs.

**Table 6-2. Off-Base Existing Land Use Acreage Within the AICUZ Noise Contours[1]**

| Designation | Generalized Land Use Category[2] | Noise Zone (dB DNL) | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 65–69 | Note | 70–74 | Note | 75–79 | Note | 80–84 | Note | 85+ | Note | |
| Incompatible | Residential | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | Commercial | | | | | | | 0 | | 0 | | 0 |
| | Industrial | | | | | | | | | 0 | | 0 |
| | Public/quasi-public | | | | | | | 0 | | 0 | | 0 |
| | Recreation | | | | | 0 | | 0 | | 0 | | 0 |
| | Open/agriculture/ low density | | | | | | | | | | | |
| Compatible | Residential | | | | | | | | | | | |
| | Commercial | 0 | | 0 | | 0 | | | | | | 0 |
| | Industrial | 0 | | 0 | | 0 | | 0 | | | | 0 |
| | Public/quasi-public | 0 | | 0 | | 0 | | | | | | 0 |
| | Recreation | 0 | | 0 | | | | | | | | 0 |
| | Open/agriculture/ low density | 5,309.3 | (3) | 3,109.2 | (3) | 1,493.3 | (3) | 276.0 | (3) | 2.2 | (3) | 10,190 |
| Subtotals | Incompatible | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | Compatible | 5,309.3 | | 3,109.2 | | 1,493.3 | | 276.0 | | 2.2 | | 10,190 |
| **Total** | | **5, 309.3** | | **3,109.2** | | **1,493.3** | | **276.0** | | **2.2** | | **10,190** |

dB = decibels; DNL = day-night average sound level

1. All contour areas on base are excluded from the counts.
2. Refer to Appendix A for details.
3. Compatible with restrictions.

**Table 6-3. Off-Base Existing Land Use Acreage Within the Accident Potential/Clear Zone[1]**

| Designation | Generalized Land Use Category[2] | CZ | Note | APZ I | Note | APZ II | Note | Total |
|---|---|---|---|---|---|---|---|---|
| Incompatible | Residential | 0 | | 0 | | 0 | | 0 |
| | Commercial | 0 | | | | | | 0 |
| | Industrial | 0 | | | | | | 0 |
| | Public/quasi-public | 0 | | 0 | | | | 0 |
| | Recreation | 0 | | | | | | 0 |
| | Open/agriculture/ low density | 115.8 | | | | | | 115.8 |
| | Undesignated | - | | - | | - | | - |
| Compatible | Residential | | | | | | | |
| | Commercial | | | 0 | | 0 | 0 | 0 |
| | Industrial | | | 0 | | 0 | 0 | 0 |
| | Public/quasi-public | | | | | 0 | 0 | 0 |
| | Recreation | | | 0 | | 0 | 0 | 0 |
| | Open/agriculture/ low density | | | 659.8 | (3) | 964.2 | (3) | 1624 |
| | Undesignated | | | | | | | |
| Subtotals | Incompatible | 115.8 | | 0 | | | | 115.8 |
| | Compatible | - | | 659.8 | | 964.2 | | 1624 |
| | **Total** | **115.8** | | **659.8** | | **964.2** | | **1,739.8** |

APZ = Accident Potential Zone; CZ = Clear Zone

1. All contour areas on-base are excluded from the counts.
2. Refer to Appendix A for details.
3. Compatible with restrictions

#### *6.4.2.1 Elmore County*

There is no incompatible residential land use within the AICUZ noise contours for Mountain Home AFB. The majority of the land is zoned for agricultural use, and a substantial portion lies within the Air Base Hazard Zone. As identified in Table 6-3, there are 115.8 acres within the CZ that are not owned or controlled by the Air Force. Efforts are underway to acquire real property interest in the remaining land areas.

### *6.4.3 Future Land Use Compatibility Concerns*

The generalized AICUZ compatibility guidelines in Table 6-1 were compared with future land use plans to determine what type of compatibility was associated with aircraft-generated noise and CZs/APZs at Mountain Home AFB. Future land use compatibility acreages are provided in Table 6-4 and Table 6-5. Based on the lack of incompatible land uses associated with aircraft-generated noise and the existing planning guidelines outlined in the Elmore County Comprehensive Plan, no incompatible land uses are anticipated in the future. It is anticipated that the Air Force will acquire ownership of the remaining property within the CZs, thereby reducing incompatible land uses in the CZs.

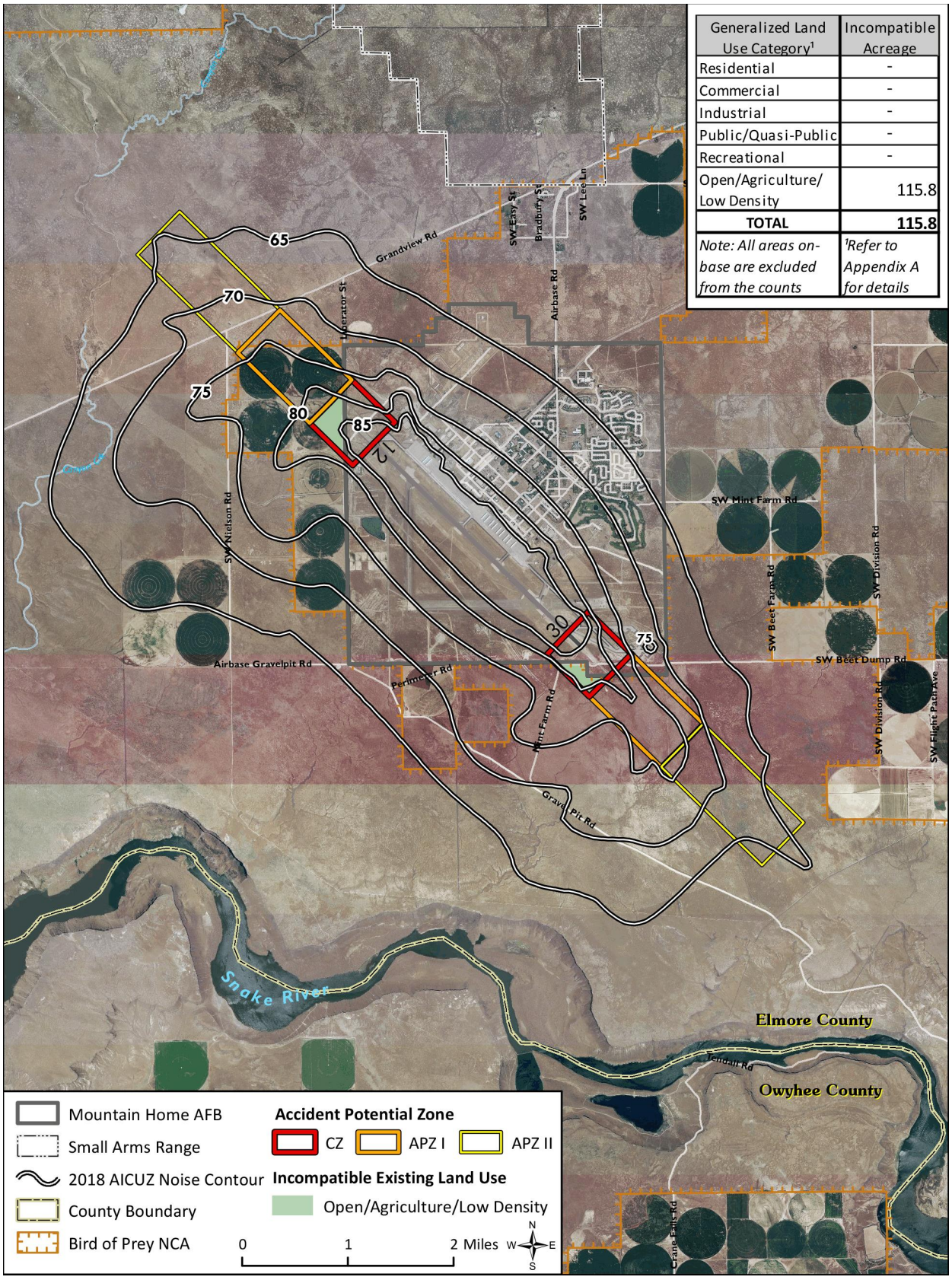


**Figure 6-5. Incompatible Existing Land Use**

**Table 6-4. Off-Base Future Land Use Acreage Within the AICUZ Noise Contours[1]**

| Designation | Generalized Land Use Category[2] | Noise Zone (dB DNL) | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 65–69 | Note | 70–74 | Note | 75–79 | Note | 80–84 | Note | 85+ | Note | |
| Incompatible | Residential | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | Commercial | | | | | | | 0 | | 0 | | 0 |
| | Industrial | | | | | | | | | 0 | | 0 |
| | Public/quasi-public | | | | | | | 0 | | 0 | | 0 |
| | Recreation | | | | | | | 0 | | 0 | | 0 |
| | Open/agriculture/ low density | | | | | | | | | | | |
| | Undesignated | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| Compatible | Residential | | | | | | | | | | | |
| | Commercial | | | | | | | | | | | 0 |
| | Industrial | | | | | | | 0 | | | | 0 |
| | Public/quasi-public | | | | | | | | | | | 0 |
| | Recreation | | | | | | | | | | | 0 |
| | Open/agriculture/ low density | 5,309.3 | | 3,109.2 | | 1,493.3 | | 276.0 | | 2.2 | | 10,190 |
| | Undesignated | | | | | | | | | | | |
| Subtotals | Incompatible | 0 | | 0 | | 0 | | 0 | | 0 | | 0 |
| | Compatible | 5,309.3 | | 3,109.2 | | 1,493.3 | | 276.0 | | 2.2 | | 10,190 |
| | **Total** | **5,309.3** | | **3,109.2** | | **1,493.3** | | **276.0** | | **2.2** | | **10,190** |

dB = decibels; DNL = day-night average sound level

1. All contour areas on-base are excluded from the counts.
2. Refer to Appendix A for details.

**Table 6-5. Off-Base Future Land Use Acreage Within the Accident Potential/Clear Zone[1]**

| Designation | Generalized Land Use Category[2] | CZ | Note | APZ I | Note | APZ II | Note | Total |
|---|---|---|---|---|---|---|---|---|
| Incompatible | Residential | 0 | | 0 | | 0 | | 0 |
| | Commercial | 0 | | | | | | 0 |
| | Industrial | 0 | | | | | | 0 |
| | Public/quasi-public | 0 | | 0 | | | | 0 |
| | Recreation | 0 | | | | | | 0 |
| | Open/agriculture/low density | | | | | | | |
| | Undesignated | 0 | | 0 | | 0 | | 0 |
| Compatible | Residential | | | | | | | |
| | Commercial | | | 0 | | 0 | | 0 |
| | Industrial | | | 0 | | 0 | | 0 |
| | Public/quasi-public | | | | | 0 | | 0 |
| | Recreation | | | 0 | | 0 | | 0 |
| | Open/agriculture/low density | | | | | | | |
| | Undesignated | | | | | | | |
| Subtotals | Incompatible | 0 | | 0 | | 0 | | 0 |
| | Compatible | 0 | | 0 | | 0 | | 0 |
| | **Total** | 0 | | 0 | | 0 | | 0 |

APZ = Accident Potential Zone; CZ = Clear Zone

1. All contour areas on-base are excluded from the counts
2. Refer to Appendix A for details.

# 7.0 Implementation

Implementation of the AICUZ Study must be a joint effort between Mountain Home AFB and the surrounding communities. This AICUZ Study provides the best source of information to ensure land use planning decisions made by the local municipalities are compatible with a future installation presence. This chapter discusses the roles of all the partners in the collaborative planning.

## 7.1 Air Force Role

The goal of the Air Force AICUZ Program is to minimize the noise and safety concerns on the surrounding communities and to advise these communities on potential impacts from base operations on the safety, welfare, and quality of life of their citizens. Mountain Home AFB's AICUZ responsibilities encompass the areas of flight safety, noise abatement, and participation in the land use planning process.

Air Force policy and guidance requires that base leadership periodically review existing practices for flight operations and evaluate these factors in relationship to populated areas and other local situations:

- Mountain Home AFB should ensure that, wherever possible, flights are routed over sparsely populated areas to reduce the exposure of lives and property to a potential accident.
- Mountain Home AFB should periodically review existing traffic patterns, instrument approaches, weather conditions, and operating practices and evaluate these factors in relationship to populated areas and other local situations. This is done in order to limit, reduce, and control the impact of noise from flying operations on surrounding communities.
- Mountain Home AFB should continue to participate in community forums with surrounding stakeholders to discuss land use and other issues of concern; these meetings should be held quarterly.
- Mountain Home AFB should schedule land use planning meetings to provide a forum for agencies to meet and discuss future developments and address issues that may surface as a result of new proposals, in an effort to further facilitate and promote straightforward, consistent, two-way discussion and information sharing.
- Mountain Home AFB should provide copies of the AICUZ Study to local, county, tribal, and regional planning departments and zoning administrators to aid in the planning process and also provide copies of the AICUZ Study to appropriate state and federal agencies.
- Mountain Home AFB, in accordance with DoD Instruction 4165.57, *Air Installations Compatible Use Zones (AICUZ)*, and AFI 32-7063, *Air Installation Compatible Use Zone Program*, continues to pursue acquisition, whenever practicable, of interest in fee or through appropriate restrictive easements for

the remaining parcels within Mountain Home AFB's CZ that are not owned by the installation and do not have any protection against incompatible use. Establishing land use controls on these parcels would protect Mountain Home AFB missions and support future compatible land uses.

Preparation and presentation of this Mountain Home AFB AICUZ Study is one phase of continuing Air Force participation in the local planning process. The Air Force recognizes that, as the local community updates its land use plans, Mountain Home AFB must be ready to provide additional input as needed.

## 7.2 State/Regional Roles

In 2010, a Joint Land Use Study (JLUS) was completed for the State of Idaho, and it includes Mountain Home AFB, the Mountain Home Range Complex, and Gowen Field and the Orchard Training Area utilized by the Air National Guard 124th Fighter Wing out of Boise, Idaho. The JLUS included other community stakeholders and was designed to facilitate a cooperative approach that promoted compatible land use. Financial support was provided by the DoD Office of Economic Adjustment. The primary goal of the JLUS was to achieve long-term compatibility between Mountain Home AFB and Gowen Field's military operations and the community's development goals.

The base was engaged in the process, and Elmore, Owyhee, and Ada Counties have adopted resolutions supporting the JLUS. The JLUS implementation committee meets quarterly and consists of representatives from the Idaho Military Affairs Council, Mountain Home AFB, Gowen Field, and the associated counties. The results of this 2018 AICUZ Study will be incorporated into planning and zoning recommendations to Elmore and Owyhee Counties.

Typical state and local actions include, but are not limited to, the following:

- Participating in collaborative frameworks such as the Mountain Home AFB Restoration Advisory Board to address areas of mutual concern.
- Using existing statutory authority at the local level to designate the land surrounding military installations as areas of critical state concern.
- Engaging with local planners and planning boards to be aware of potentially harmful rezoning, development decisions, and policy or regulation changes.
- Incorporating AICUZ criteria into comprehensive plans and zoning ordinances. Mountain Home AFB's commitment to surrounding communities necessitates (1) considering how the installation's current and future missions directly affect members of the surrounding community and (2) understanding the community's interest in safety and the effects of noise associated with flying missions.

These activities have continued as the State of Idaho and the Idaho JLUS Implementation Committee have provided support to Mountain Home AFB. The Idaho Transportation Department, Division of Aeronautics, has published the Idaho Airport Land Use Guidelines identifying the requirements for marking hazards to air flight through the airspace of and over the state of Idaho. These requirements are presented

in the Idaho Administrative Code Section 39.04.02 (Idaho Department of Transportation, 2016).

## 7.3 Local Government Role

The role of the local government is to enact planning, zoning, and development principles and practices that are compatible with the base and protect the base's mission. The residents of the surrounding community have a long history of working with personnel from Mountain Home AFB. Adoption of the following recommendations during the revision of relevant land use planning or zoning regulations will strengthen this relationship, increase the health and safety of the public, and protect the integrity of the installation's flying mission:

- Recommend local government planners maintain adopted AICUZ policies and guidelines when developing or revising city comprehensive plans and use AICUZ overlay maps and Air Force Land Use Compatibility Guidelines (see Appendix A) to evaluate existing and future land use proposals.
- Ensure that new development applications or "changed use of property" are submitted to Mountain Home AFB to afford the opportunity to assess those applications for potential impacts on defense missions. The Mountain Home AFB Public Affairs Office can provide a land use planning point of contact.
- Recommend zoning ordinances be adopted or modified to reflect the compatible land uses outlined in the AICUZ Study.
- Recommend local government and county planners continue to consult on land use matters within overlapping extra-territorial jurisdictions near Mountain Home AFB.
- Recommend local governments review their capital improvement plan, infrastructure investments, and development policies to ensure they do not encourage incompatible land use patterns near Mountain Home AFB, with particular emphasis on utility extension and transportation planning.
- Recommend local governments implement height and obstruction ordinances that reflect current Air Force and 14 CFR part 77 requirements, presented in this study as HAFZs.
- Recommend fair disclosure ordinances be enacted to require disclosure to the public for those AICUZ items that directly relate to aircraft operations at Mountain Home AFB.
- Recommend local governments, where allowed, require real estate disclosure for individuals purchasing property within noise contours or CZs/APZs.
- Enact or modify building/residential codes to ensure that any new construction near Mountain Home AFB has the recommended noise-level reduction measures incorporated into the design and construction of structures.

- Recommend government planning bodies monitor proposals for tall structures, such as wind turbines and communication towers, to ensure that new construction does not pose a hazard to navigable airspace around Mountain Home AFB and is in accordance with Idaho Administrative Procedures Act (IDAPA) 39.04.02. Where appropriate, coordinate with the FAA on the height of structures.
- Recommend that local government land use plans and ordinances reflect AICUZ recommendations for development in CZs/APZs and noise zones.
- Recommend that local governments continue to consult with Mountain Home AFB on planning and zoning actions that have the potential to affect base operations.
- Maintain Air Force as an ex officio member on boards, commissions, and regional councils addressing long-range development and other planning policies.
- Continue participation in bi-annual JLUS implementation meetings to discuss land use concerns and major development proposals that could affect aircraft operations.

## 7.4 Community Roles

Neighboring residents and base personnel have a long-established history of working together for the mutual benefit of the Mountain Home AFB mission and local community. Adoption of the following recommendations will strengthen this relationship, protect the health and ensure the safety of the public, and help protect the integrity of the installation‘s flying mission.

Recommendations for real estate professionals and brokers are as follows:

- Know where the noise zones and CZs/APZs encumber land near the base and invite the base representative to brokers’ meeting to discuss the AICUZ Program with the real estate professionals.
- Disclose noise impact to all prospective buyers of properties within areas greater than 65 dB DNL or within the CZs/APZs.
- Require the Multiple Listing Service to disclose noise zones and CZs/APZs on all listings.

Recommendations for developers are as follows:

- Know where the noise zones and CZs/APZs encumber land near the base. Consult with Mountain Home AFB on proposed developments within the AICUZ.
- Make recommendations regarding existing zoning ordinances and subdivision regulations to support the compatible land uses outlined in this study through implementation of a zoning overlay district based on noise contours and CZs/APZs.

Recommendations for local citizens are as follows:

- Participate in local forums with the base to learn more about the base's missions.
- Become informed about the AICUZ Program and learn about the program's goals, objectives, and value in protecting the public's health, safety, and welfare.
- When considering property purchases, ask local real estate professionals, city planners, and base representatives about noise and accident potential.

Although the base and community are separated by a fence, what the Air Force does affects the community and, conversely, what the community does can affect the Air Force mission. Collaborative planning, the forging of partnerships, open communications, and close relationships help the Air Force and its neighbors achieve their mutual goals.

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# 8.0 References


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# Appendix A Land Use Compatibility Tables

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|
| 10 | Residential | | | | |
| 11 | Household Units | | | | |
| 11 | Single units: detached | N | N | Y[2] | Maximum density of 2 Du/Ac |
| 11 | Single units: semidetached | N | N | N | |
| 11 | Single units: attached row | N | N | N | |
| 11 | Two units: side-by-side | N | N | N | |
| 11 | Two units: one above the other | N | N | N | |
| 11 | Apartments: walk-up | N | N | N | |
| 11 | Apartment: elevator | N | N | N | |
| 12 | Group quarters | N | N | N | |
| 13 | Residential hotels | N | N | N | |
| 14 | Mobile home parks or courts | N | N | N | |
| 15 | Transient lodgings | N | N | N | |
| 16 | Other residential | N | N | N | |
| 20 | Manufacturing [3] | | | | |
| 21 | Food and kindred products; manufacturing | N | N | Y | Maximum floor area ratio (FAR) 0.56 in APZ II |
| 22 | Textile mill products; manufacturing | N | N | Y | Maximum FAR 0.56 in APZ II |
| 23 | Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing | N | N | N | |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 25 | Furniture and fixtures; manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 26 | Paper and allied products; manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|
| 27 | Printing, publishing, and allied industries | N | Y | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 28 | Chemicals and allied products; manufacturing | N | N | N | |
| 29 | Petroleum refining and related industries | N | N | N | |
| **30** | **Manufacturing[3] (continued)** | | | | |
| 31 | Rubber and miscellaneous plastic products; manufacturing | N | N | N | |
| 32 | Stone, clay, and glass products; manufacturing | N | N | Y | Maximum FAR 0.56 in APZ II |
| 33 | Primary metal products; manufacturing | N | N | Y | Maximum FAR 0.56 in APZ II |
| 34 | Fabricated metal products; manufacturing | N | N | Y | Maximum FAR 0.56 in APZ II |
| 35 | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks | N | N | N | |
| 39 | Miscellaneous manufacturing | N | Y | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| **40** | **Transportation, communication, and utilities[3, 4]** | | | | |
| 41 | Railroad, rapid rail transit, and street railway transportation | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 42 | Motor vehicle transportation | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 43 | Aircraft transportation | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 44 | Marine craft transportation | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 45 | Highway and street right-of-way | Y[5] | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 46 | Automobile parking | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 47 | Communication | N | Y[6] | Y | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 48 | Utilities[7] | N | Y[6] | Y[6] | Maximum FAR of 0.28 in APZ I and 0.56 in APZ II |
| 49 | Solid waste disposal (landfills, incinerators, etc.) | N | N | N | |

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|
| 49 | Other transportation, communication, and utilities | N | Y[6] | Y | See Note 6 below |
| **50** | **Trade** | | | | |
| 51 | Wholesale trade | N | Y | Y | Maximum FAR of 0.28 in APZ I and .56 in APZ II |
| 52 | Retail trade – building materials, hardware and farm equipment | N | Y | Y | See Note 8 below |
| 53 | Retail trade – including, discount clubs, home improvement stores, electronics superstores, etc. | N | N | Y | Maximum FAR of 0.16 in APZ II |
| 53 | Shopping centers – neighborhood, community, regional, super-regional[9] | N | N | N | |
| 54 | Retail trade – food | N | N | Y | Maximum FAR of 0.24 in APZ II |
| 55 | Retail trade – automotive, marine craft, aircraft, and accessories | N | Y | Y | Maximum FAR of 0.14 in APZ I and 0.28 in APZ II |
| 56 | Retail trade – apparel and accessories | N | N | Y | Maximum FAR of 0.28 in APZ II |
| 57 | Retail trade – furniture, home, furnishings and equipment | N | N | Y | Maximum FAR of 0.28 in APZ II |
| 58 | Retail trade – eating and drinking establishments | N | N | N | |
| 59 | Other retail trade | N | N | Y | Maximum FAR of 0.16 in APZ II |
| **60** | **Services[10]** | | | | |
| 61 | Finance, insurance, and real estate services | N | N | Y | Maximum FAR of 0.22 in APZ II |
| 62 | Personal services | N | N | Y | Office uses only; maximum FAR of 0.22 in APZ II. |
| 62 | Cemeteries | N | Y[11] | Y[11] | |
| 63 | Business services (credit reporting; mail, stenographic, reproduction; advertising) | N | N | Y | Maximum FAR of 0.22 in APZ II |
| 64 | Warehousing and storage services[12] | N | Y | Y | Maximum FAR of 1.0 in APZ I; 2.0 in APZ II |
| 64 | Repair services | N | Y | Y | Maximum FAR of 0.11 APZ I; 0.22 in APZ II |

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|
| 65 | Professional services | N | N | Y | Maximum FAR of 0.22 in APZ II |
| 65 | Hospitals, nursing homes | N | N | N | |
| 65 | Other medical facilities | N | N | N | |
| 66 | Contract construction services | N | Y | Y | Maximum FAR of 0.11 APZ I; 0.22 in APZ II |
| 67 | Government services | N | N | Y | Maximum FAR of 0.24 in APZ II |
| 68 | Educational services | N | N | N | |
| 68 | Child care services, child development centers, and nurseries | N | N | N | |
| 69 | Miscellaneous services | N | N | Y | Maximum FAR of 0.22 in APZ II |
| 69 | Religious activities (including places of worship) | N | N | N | |
| **70** | **Cultural, entertainment and recreational** | | | | |
| 71 | Cultural activities | N | N | N | |
| 71 | Nature exhibits | N | Y[13] | Y[13] | |
| 72 | Public assembly | N | N | N | |
| 72 | Auditoriums, concert halls | N | N | N | |
| 72 | Outdoor music shells, amphitheaters | N | N | N | |
| 72 | Outdoor sports arenas, spectator sports | N | N | N | |
| 73 | Amusements – fairgrounds, miniature golf, driving ranges; amusement parks, etc. | N | N | Y[20] | |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y[13] | Y[13] | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II |
| 75 | Resorts and group camps | N | N | N | |
| 76 | Parks | N | Y[13] | Y[13] | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II |
| 79 | Other cultural, entertainment, and recreation | N | Y[11] | Y[11] | Maximum FAR of 0.11 in APZ I; 0.22 in APZ II |
| **80** | **Resource production and extraction** | | | | |
| 81 | Agriculture (except livestock) | Y[4] | Y[14] | Y[14] | |

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|
| 81.5-81.7, | Agriculture-livestock farming, including grazing and feedlots | N | Y[14] | Y[14] | |
| 82 | Agriculture-related activities | N | Y[15] | Y[15] | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity that produces smoke, glare, or involves explosives |
| 83 | Forestry activities[16] | N | Y | Y | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity that produces smoke, glare, or involves explosives |
| 84 | Fishing activities[17] | N[17] | Y | Y | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity that produces smoke, glare, or involves explosives |
| 85 | Mining activities[18] | N | Y[18] | Y[18] | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity that produces smoke, glare, or involves explosives |
| 89 | Other resource production or extraction | N | Y | Y | Maximum FAR of 0.28 in APZ I; 0.56 in APZ II, no activity that produces smoke, glare, or involves explosives |
| **90** | **Other** | | | | |
| 91 | Undeveloped land | Y | Y | Y | |
| 93 | Water areas[19] | N[19] | N[19] | N[19] | |

APZ = Accident Potential Zone; CZ = Clear Zone; Du/Ac = detached units per acre; N = No; SLUCM = Standard Land Use Classification Manual; Y = Yes

1. A "Yes" or a "No" designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist air installations and local governments, general suggestions as to FARs are provided as a guide to density in some categories. In general, land use restrictions that limit occupants, including employees, of commercial, service, or industrial buildings or structures to 25 an acre in APZ I and 50 an acre in APZ II are considered to be low density. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I and maximum assemblies of 50 people an acre in APZ II. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I and II. For APZ I, the formula is FAR = 25 people an acre/ (average vehicle occupancy x average parking rate x (43,560/1,000)). The formula for APZ II is FAR = 50/ (average vehicle occupancy x average parking rate x (43,560/1,000)).
2. The suggested maximum density for detached single-family housing is two detached units per acre (Du/Ac). In a planned unit development (PUD) of single family detached units, where clustered housing development results in large open areas, this density could possibly be increased slightly, provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.
3. Other factors to be considered: labor intensity, structural coverage, explosive characteristics, air-pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.
4. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above-ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.
5. Roads within the graded portion of the Clear Zone are prohibited. All roads within the Clear Zone are discouraged, but if required,

**Table A-1. Land Use Compatibility Recommendations in APZs and CZs**

| SLUCM NO. | LAND USE NAME | CLEAR ZONE Recommendation[1] | APZ-I Recommendation[1] | APZ-II Recommendation[1] | DENSITY Recommendation[1] |
|---|---|---|---|---|---|

they should not be wider than two lanes and the rights-of-way should be fenced (frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.

6. No above-ground passenger terminals and no above-ground power transmission or distribution lines. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.

7. Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should to be analyzed for compatibility issues on a case-by-case basis that considers both the proposal and potentially affected mission.

8. Within SLUCM Code 52, maximum FARs for lumberyards (SLUCM Code 521) are 0.20 in APZ I and 0.40 in APZ 11; the maximum FARs for hardware, paint, and farm equipment stores (SLUCM Code 525), are 0.12 in APZ I and 0.24 in APZ II.

9. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively.

[1]10. Ancillary uses such as meeting places, auditoriums, etc., are not recommended.

11. No chapels or houses of worship are allowed within APZ I or APZ II.

12. Big box home improvement stores are not included as part of this category.

13. Facilities must be low intensity and provide no playgrounds, etc. Facilities such as clubhouses, meeting places, auditoriums, large classes, etc., are not recommended.

14. Activities that attract concentrations of birds creating a hazard to aircraft operations should be excluded.

15. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

16. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zone lands owned in fee will be disposed of in accordance with applicable DoD guidance.

17. Controlled hunting and fishing may be permitted for the purpose of wildlife management.

18. Surface mining operations that could create retention ponds that may attract waterfowl and present bird/wildlife aircraft strike hazards (BASH) or operations that produce dust or light emissions that could affect pilot vision are not compatible.

19. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are pre-existing, nonconforming land uses. Naturally occurring water features that attract waterfowl present a potential BASH. Actions to expand naturally occurring water features or construction of new water features should not be encouraged. If construction of new features is necessary for stormwater retention, such features should be designed so that they do not attract waterfowl.

20. Amusement centers, family entertainment centers, or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II.

**Table A-2. Recommended Land Use Compatibility for Noise Zones**

| LAND USE | | SUGGESTED LAND USE COMPATIBILITY | | | | |
|---|---|---|---|---|---|---|
| SLUCM NO. | LAND USE NAME | DNL or CNEL 65-69 | DNL or CNEL 70-74 | DNL or CNEL 75-79 | DNL or CNEL 80-84 | DNL or CNEL 85+ |
| **10** | **Residential** | | | | | |
| 11 | Household units | N[1] | N[1] | N | N | N |
| 11.1 | Single units: detached | N[1] | N[1] | N | N | N |
| 11.1 | Single units: semidetached | N[1] | N[1] | N | N | N |
| 11.1 | Single units: attached row | N[1] | N[1] | N | N | N |
| 11.2 | Two units: side-by-side | N[1] | N[1] | N | N | N |
| 11.2 | Two units: one above the other | N[1] | N[1] | N | N | N |
| 11.3 | Apartments: walk-up | N[1] | N[1] | N | N | N |
| 11.3 | Apartment: elevator | N[1] | N[1] | N | N | N |
| 12 | Group quarters | N[1] | N[1] | N | N | N |
| 13 | Residential hotels | N[1] | N[1] | N | N | N |
| 14 | Mobile home parks or courts | N | N | N | N | N |
| 15 | Transient lodgings | N[1] | N[1] | N[1] | N | N |
| 16 | Other residential | N[1] | N[1] | N | N | N |
| **20** | **Manufacturing** | | | | | |
| 21 | Food and kindred products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 22 | Textile mill products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 23 | Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 24 | Lumber and wood products (except furniture); manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 25 | Furniture and fixtures; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 26 | Paper and allied products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 27 | Printing, publishing, and allied industries | Y | Y[2] | Y[3] | Y[4] | N |
| 28 | Chemicals and allied products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 29 | Petroleum refining and related industries | Y | Y[2] | Y[3] | Y[4] | N |
| **30** | **Manufacturing (continued)** | | | | | |
| 31 | Rubber and misc. plastic products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 32 | Stone, clay and glass products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 33 | Primary metal products; | Y | Y[2] | Y[3] | Y[4] | N |

**Table A-2. Recommended Land Use Compatibility for Noise Zones**

| LAND USE | | SUGGESTED LAND USE COMPATIBILITY | | | | |
|---|---|---|---|---|---|---|
| SLUCM NO. | LAND USE NAME | DNL or CNEL 65-69 | DNL or CNEL 70-74 | DNL or CNEL 75-79 | DNL or CNEL 80-84 | DNL or CNEL 85+ |
| | manufacturing | | | | | |
| 34 | Fabricated metal products; manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| 35 | Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks | Y | 25 | 30 | N | N |
| 39 | Miscellaneous manufacturing | Y | Y[2] | Y[3] | Y[4] | N |
| **40** | **Transportation, communication and utilities** | | | | | |
| 41 | Railroad, rapid rail transit, and street railway transportation | Y | Y[2] | Y[3] | Y[4] | N |
| 42 | Motor vehicle transportation | Y | Y[2] | Y [3] | Y[4] | N |
| 43 | Aircraft transportation | Y | Y[2] | Y[3] | Y[4] | N |
| 44 | Marine craft transportation | Y | Y[2] | Y[3] | Y[4] | N |
| 45 | Highway and street right-of-way | Y | Y | Y | Y | N |
| 46 | Automobile parking | Y | Y | Y | Y | N |
| 47 | Communication | Y | 255 | 305 | N | N |
| 48 | Utilities | Y | Y[2] | Y[3] | Y[4] | N |
| 49 | Other transportation, communication and utilities | Y | 255 | 305 | N | N |
| **50** | **Trade** | | | | | |
| 51 | Wholesale trade | Y | Y[2] | Y[3] | Y[4] | N |
| 52 | Retail trade – building materials, hardware and farm equipment | Y | 25 | 30 | Y[4] | N |
| 53 | Retail trade – including shopping centers, discount clubs, home improvement stores, electronics superstores, etc. | Y | 25 | 30 | N | N |
| 54 | Retail trade – food | Y | 25 | 30 | N | N |
| 55 | Retail trade – automotive, marine craft, aircraft and accessories | Y | 25 | 30 | N | N |
| 56 | Retail trade – apparel and accessories | Y | 25 | 30 | N | N |
| 57 | Retail trade – furniture, home, furnishings and equipment | Y | 25 | 30 | N | N |
| 58 | Retail trade – eating and drinking establishments | Y | 25 | 30 | N | N |
| 59 | Other retail trade | Y | 25 | 30 | N | N |

**Table A-2. Recommended Land Use Compatibility for Noise Zones**

| LAND USE | | SUGGESTED LAND USE COMPATIBILITY | | | | |
|---|---|---|---|---|---|---|
| SLUCM NO. | LAND USE NAME | DNL or CNEL 65-69 | DNL or CNEL 70-74 | DNL or CNEL 75-79 | DNL or CNEL 80-84 | DNL or CNEL 85+ |
| **60** | **Services** | | | | | |
| 61 | Finance, insurance, and real estate services | Y | 25 | 30 | N | N |
| 62 | Personal services | Y | 25 | 30 | N | N |
| 62.4 | Cemeteries | Y | Y[2] | Y[3] | Y[4,11] | Y[6,11] |
| 63 | Business services | Y | 25 | 30 | N | N |
| 63.7 | Warehousing and storage | Y | Y[2] | Y[3] | Y[4] | N |
| 64 | Repair services | Y | Y[2] | Y[3] | Y[4] | N |
| 65 | Professional services | Y | 25 | 30 | N | N |
| 65.1 | Hospitals, other medical facilities | 25 | 30 | N | N | N |
| 65.2 | Nursing homes | N[1] | N[1] | N | N | N |
| 66 | Contract construction services | Y | 25 | 30 | N | N |
| 67 | Government services | Y[1] | 25 | 30 | N | N |
| 68 | Educational services | 25 | 30 | N | N | N |
| 68.1 | Child care services, child development centers, and nurseries | 25 | 30 | N | N | N |
| 69 | Miscellaneous services | Y | 25 | 30 | N | N |
| 69.1 | Religious activities (including places of worship) | Y | 25 | 30 | N | N |
| **70** | **Cultural, entertainment and recreational** | | | | | |
| 71 | Cultural activities | 25 | 30 | N | N | N |
| 71.2 | Nature exhibits | Y[1] | N | N | N | N |
| 72 | Public assembly | Y | N | N | N | N |
| 72.1 | Auditoriums, concert halls | 25 | 30 | N | N | N |
| 72.1 | Outdoor music shells, amphitheaters | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | Y[7] | Y[7] | N | N | N |
| 73 | Amusements | Y | Y | N | N | N |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | Y | 25 | 30 | N | N |
| 75 | Resorts and group camps | Y | 25 | N | N | N |
| 76 | Parks | Y | 25 | N | N | N |
| 79 | Other cultural, entertainment and recreation | Y | 25 | N | N | N |
| **80** | **Resource production and extraction** | | | | | |
| 81 | Agriculture (except live-stock) | Y[8] | Y[9] | Y[10] | Y[10,11] | Y[10,11] |
| 81.5-81.7 | Agriculture-Livestock farming | Y[8] | Y[9] | N | N | N |

**Table A-2. Recommended Land Use Compatibility for Noise Zones**

| LAND USE | | SUGGESTED LAND USE COMPATIBILITY | | | | |
|---|---|---|---|---|---|---|
| SLUCM NO. | LAND USE NAME | DNL or CNEL 65-69 | DNL or CNEL 70-74 | DNL or CNEL 75-79 | DNL or CNEL 80-84 | DNL or CNEL 85+ |
| | including grazing and feedlots | | | | | |
| 82 | Agriculture-related activities | Y[8] | Y[9] | Y[10] | Y[10,11] | Y[10,11] |
| 83 | Forestry activities | Y[8] | Y[9] | Y[10] | Y[10,11] | Y[10,11] |
| 84 | Fishing activities | Y | Y | Y | Y | Y |
| 85 | Mining activities | Y | Y | Y | Y | Y |
| 89 | Other resource production or extraction | Y | Y | Y | Y | Y |

1. General:

(a) Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in 65- to 69-dB DNL areas (i.e., "DNL 65-69") and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.

(b) Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor noise level reduction (NLR) of at least 25 decibels (dB) in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-79.

(c) Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

(d) NLR criteria will not eliminate outdoor noise problems. However, building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.
5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.
6. Buildings are not permitted.
7. Land use is compatible, provided that special sound reinforcement systems are installed.
8. Residential buildings require an NLR of 25.
9. Residential buildings require an NLR of 30.
10. Residential buildings are not permitted.
11. Land use that involves outdoor activities is not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.

# Appendix B Key Terms

- **day-night average sound level (DNL)** – DNL is a composite noise metric accounting for the sound energy of all noise events in a 24-hour period. In order to account for increased human sensitivity to noise at night, DNL includes a 10-dB penalty to events occurring during the acoustical nighttime period (10 PM through 7 AM). See Chapter 4 for additional information.
- **decibel (dB) –** A decibel is the unit used to measure the intensity of a sound.
- **flight profiles –** Flight profiles consist of aircraft conditions (altitude, speed, power setting, etc.) defined at various locations along each assigned flight track.
- **flight track –** The flight track locations represent the various types of arrivals, departures, and closed patterns accomplished at air installations. The location for each track is representative for the specific track and may vary due to air traffic control, weather, and other reasons (e.g., one pilot may fly on one side of the depicted track, while another pilot may fly slightly to the other side of the track).
- **operation –** An aircraft operation is defined as one takeoff or one landing. A complete closed pattern or circuit is counted as two operations because it has a takeoff component and a landing component. A sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations, one takeoff (departure) and one landing (approach).

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