

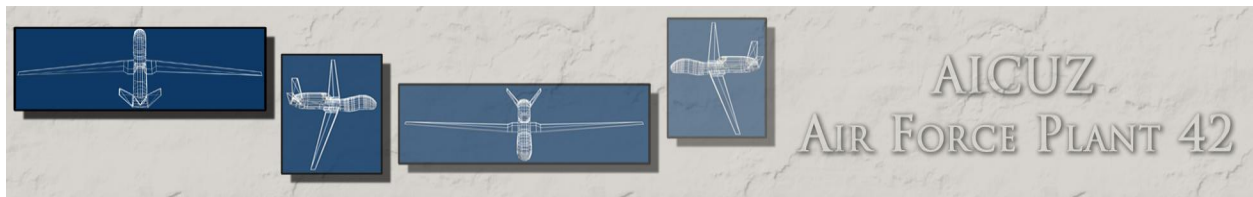
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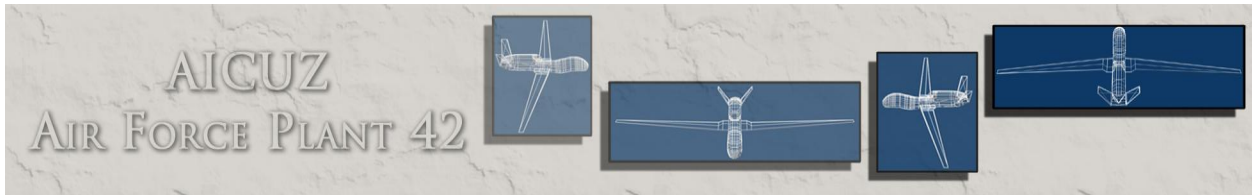
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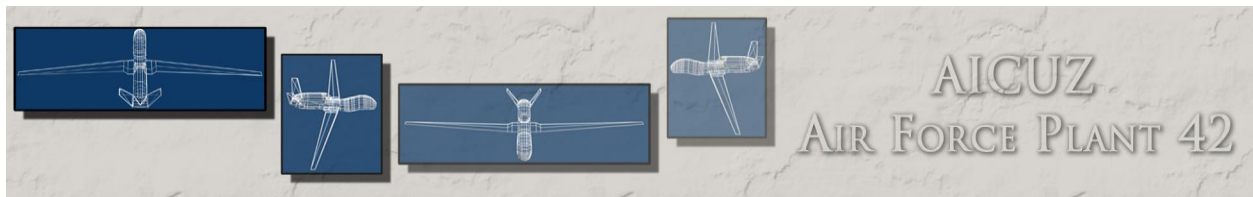
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ACRONYMS and ABBREVIATIONS

| | |
|--------|--|
| AFB | Air Force Base |
| AFH | Air Force Handbook |
| AFMC | Air Force Materiel Command |
| AGL | above ground level |
| AICUZ | Air Installation Compatible Use Zone |
| ALUC | Airport Land Use Commission |
| ANGB | Air National Guard Base |
| APZ | accident potential zone |
| ATC | air traffic control |
| CFR | Code of Federal Regulation |
| CNEL | Community Noise Equivalent Level |
| CNS | communications, navigation, surveillance |
| CZ | clear zone |
| dB | decibel |
| DNL | day-night average A-weighted sound level in decibels |
| DoD | Department of Defense |
| DoT | Department of Transportation |
| EIR | economic impact region |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| GPS | global positioning system |
| HUD | Housing and Urban Development |
| IFR | instrument flight rules |
| INM | Integrated Noise Model |
| ISR | intelligence, surveillance, and reconnaissance |
| LAWA | Los Angeles World Airports |
| MOA | military operations area |
| MSL | mean sea level |
| NAS | National Airspace System |
| NASA | National Aeronautics and Space Administration |
| Nm | nautical miles |
| OE/AAA | obstruction evaluation/airport airspace analysis |
| R | Restricted |
| SLUCM | Standard Land Use Coding Manual |
| SOFIA | Stratospheric Observatory for Infrared Astronomy |
| TRACON | terminal radar approach control |
| UAS | unmanned aircraft system |
| UFC | Unified Facility Criteria |
| USCB | U.S. Census Bureau |
| VFR | visual flight rules |
| VORTAC | very high frequency omnirange, tactical air navigation |

AICUZ
AIR FORCE PLANT 42



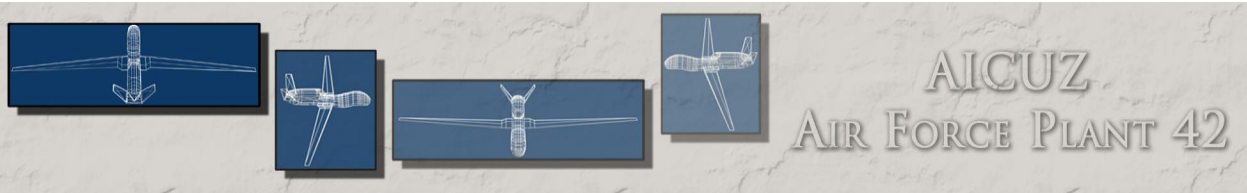
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AIR FORCE PLANT 42
CALIFORNIA

**CHAPTER 1 • PURPOSE
AND NEED**

AIR INSTALLATION COMPATIBLE USE ZONE



1.0 PURPOSE AND NEED

1.1 Introduction



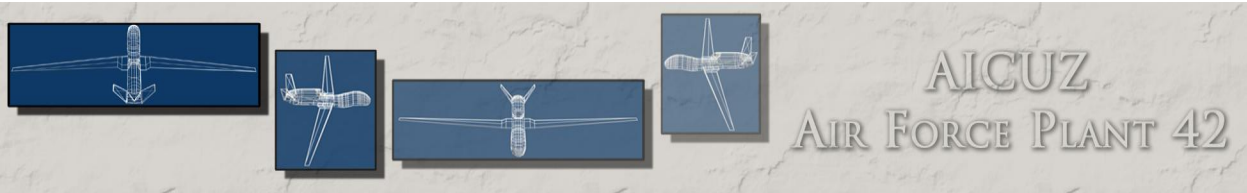
Air Force Plant 42 is a government-owned, contractor-operated facility that is hosted by Detachment 1 of the Aeronautical Systems Center, Wright-Patterson AFB, Ohio. Plant 42 provides and maintains facilities for: the mating and final assembly of jet-powered, high performance aircraft; production engineering and flight test programs; and Air Force acceptance flight test of high performance jet aircraft.

Current operations at Plant 42 include engineering and flight test of the RQ-4 Global Hawk, depot maintenance of the B-2 bomber, inspection and flight test of the U-2S, flight test of the Boeing 747-8, and home-basing of NASA's 747SP Stratospheric Observatory for Infrared Astronomy (SOFIA).

This study is an update to the 2002 US Air Force Plant 42 (Plant 42), California Air Installation Compatible Use Zone (AICUZ) study. Plant 42 is a government owned, contractor operated facility for the development, manufacturing, and testing of high performance aircraft; the installation lies in northern Los Angeles County in the city of Palmdale (Figure 1-1). This update presents and documents the changes in aircraft operations occurring at Plant 42 and the land use setting in the vicinity since the issuance of the previous AICUZ study.

This study is based on 2010 activity levels and it reaffirms Air Force policy of assisting Federal, state, regional, and local officials in the areas surrounding Plant 42 in promoting compatible development within the AICUZ area of influence and protecting Air Force operational capability from the effects of land use that are incompatible with aircraft operations. Specifically, this report documents changes in aircraft operations since the last study (2002) and provides noise contours and compatible use guidelines for land areas surrounding the installation based on 2010 operations.

The purpose of the Department of Defense's (DoD) long-standing AICUZ program is to promote compatible land development in areas subject to increased noise exposure and accident potential from ongoing aircraft operations. In addition, the AICUZ program's goal is to protect military airfields and navigable airspace near them from encroachment by incompatible uses and structures. Recommendations from this updated AICUZ study should be included in any planning process undertaken by the City of Palmdale, the City of Lancaster, and the County of Los Angeles with the goal of preventing incompatibilities that might compromise the ability of Plant 42 to fulfill its mission requirements. Accident potential and aircraft noise in the vicinity of military airfields should be major considerations in any planning process that the local municipal authorities may wish to undertake.

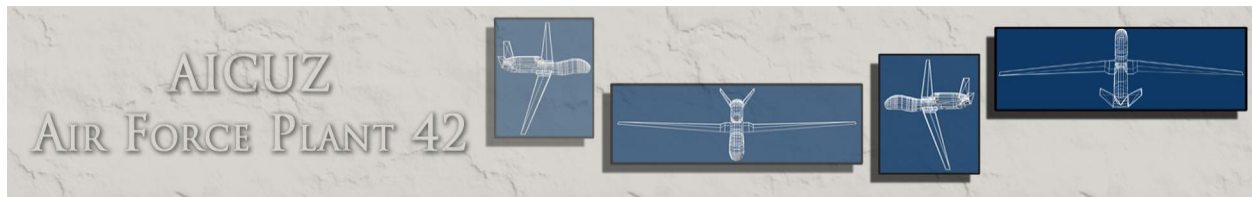


Land use guidelines for Air Force AICUZ outlined in Air Force Handbook (AFH) 32-7084 *AICUZ Program Manager's Guide* reflect preferred land use recommendations for areas underlying clear zones (CZs), accident potential zones (APZs) I and II, as well as for four predicted noise exposure zones (a description of these areas can be found in Chapter 3):

- 65-70 A-weighted decibel (dB[A]) day-night average sound level (DNL);
- 70-75 dB(A) DNL;
- 75-80 dB(A) DNL; and
- 80+ dB(A) DNL.

The predicted noise exposure zones are delineated by connecting points of equal noise exposure (contours). Land use recommendations for these noise exposure zones have been established on the basis of sociological studies prepared and sponsored by several federal agencies, including the U.S. Department of Housing and Urban Development (HUD), the U.S. Environmental Protection Agency (EPA), the U.S. Department of Transportation (DoT), and the Air Force, as well as state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. Additionally, guidelines for maximum height of man-made structures are provided to protect the navigable airspace around an airfield, particularly the approach/departure corridors extending along the axis of the runways. The Air Force has no desire to recommend land use regulations that would render property economically useless. The Air Force does, however, have an obligation to the inhabitants of the Plant 42 environs and to the citizens of the United States to point out ways to protect the people in adjacent areas as well as the public investment in the installation itself.

The AICUZ program uses the latest technology to define noise levels in areas near Air Force installations. An analysis of Plant 42's existing and anticipated flying operations was performed, including types of aircraft, flight patterns, variations in altitude, power settings, number of operations, and hours of operations. This information was used to develop the noise contours contained in this study. The DoD NOISEMAP modeling software and the previously mentioned DNL metrics were used to define the noise exposure zones at Plant 42. In addition and in recognition of California's use of a similar but alternative noise metric,



Community Noise Equivalent Level (CNEL) this report also presents predicted noise exposure in terms of CNEL for use in planning efforts undertaken within that state. However, the DoD and Air Force AICUZ program make land use recommendations based on DNL, not CNEL. Note that both DNL and CNEL measurement levels yield very similar noise contours.

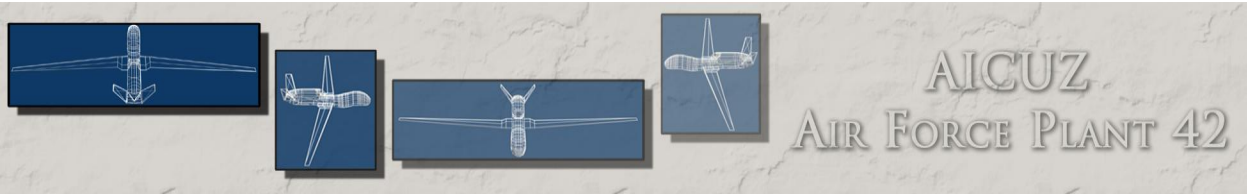
1.2 Process and Procedure

Preparation and presentation of this update to Plant 42's AICUZ study is part of the continuing Air Force participation in the local planning process. It is recognized that the Air Force has an ongoing responsibility for providing current information on its activities that potentially affect the community. As local communities prepare and periodically revise land use plans and zoning ordinances, Plant 42 presents this study in the spirit of mutual cooperation and respect with the intent of assisting in the local land use planning process. This AICUZ study reaffirms Air Force policy of promoting public health, safety, and general welfare in areas surrounding Plant 42.

Aircraft operational data used in this study were collected at Plant 42, Edwards Air Force Base (AFB) and Channel Islands Air National Guard Base (ANGB) on Naval Air Station Point Mugu in September and October 2010. The update presents and documents changes to the AICUZ for the period of 2002 to 2010 that result from changes to the mix of aircraft using Plant 42 (both transient and based) and from changes in operational intensity. Specifically, the Plant 42 has begun providing depot support and flight test for the B-2 bomber, engineering and flight test for the RQ-4 *Global Hawk* and B747-8, as well as the basing of NASA's B747SP Stratospheric Observatory for Infrared Astronomy (SOFIA). Additionally, both 412 Flight Test Wing (Edwards AFB, California) and 146 Airlift Wing (California Air National Guard, Point Mugu Naval Air Station) use Plant 42 airspace and runways extensively to maintain pilot proficiency.

Aircraft operations data were collected at Plant 42 in the fall of 2010, with modeling occurring during the winter of 2010-11 and final validation of data occurring in spring 2011. On-site interviews were performed to obtain aircraft operational and maintenance data. Using these data, average daily operations by runway and type of aircraft were derived.

These data are supplemented by flight track information (where we fly), flight profile information (how we fly), and maintenance



engine runs occurring while the aircraft is stationary (static engine run-ups). After verification of accuracy, data were input into the NOISEMAP program (Version 7.353) and noise contours were calculated; the results are expressed in terms of DNL in dB(A) units. Actual day to day flight tracks of individual flights may vary as pilots may deviate somewhat from standard tracks. For modeling purposes, standard flight tracks are used.

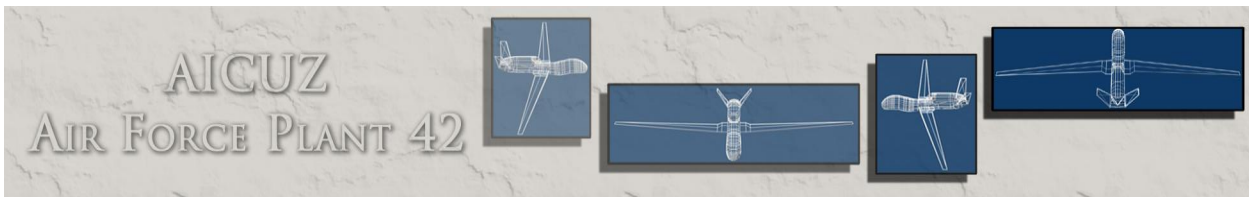
The resulting contours have been plotted on an area map and are presented in Chapter 3. Overlaid with the contours, clear zone and accident potential zone areas are shown. In addition, the Federal Aviation Administration (FAA) defined imaginary surfaces are depicted. These imaginary surfaces are designated to promote and maintain clear airspace for safe flight operations near the airfield. Objects that penetrate these surfaces are considered obstructions to air navigation. The sum of all three elements, (noise exposure, accident potential, and obstruction evaluation), constitute the AICUZ environs for a given airfield. An analysis of existing land uses, future land use, and current zoning is presented in Chapter 4. Appendix A of Volume II contains detailed information on the development of an AICUZ study.

1.3 Computerized Noise Exposure Models

The Air Force developed and adopted the use of the NOISEMAP computer program to describe noise impacts created by aircraft operations. NOISEMAP is one of two EPA approved computer noise modeling for aircraft modeling; the other is the Integrated Noise Model (INM), used by the FAA for noise analysis at civil airports. The NOISEMAP and INM programs are similar; however, INM does not contain noise data for all military aircraft.

NOISEMAP is a suite of computer programs and components developed by the Air Force to predict noise exposure in the vicinity of an airfield due to aircraft flight, maintenance, and ground run-up operations. The components of NOISEMAP are:

- BASEOPS is the input module for NOISEMAP and is used to enter detailed aircraft flight track, profile, and ground maintenance operational data.
- NOISEFILE is a comprehensive database of measured military and civil aircraft noise data. Aircraft operational information is matched with the noise measurements in the NOISEFILE after the detailed aircraft flight and ground



maintenance operational data has been entered into BASEOPS.

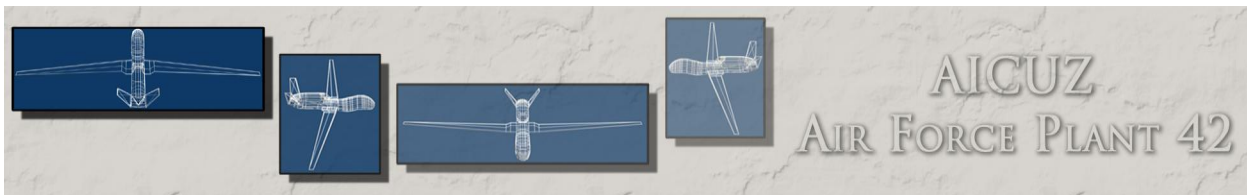
- NMAP is the computational module in NOISEMAP. NMAP takes BASEOPS input and uses the NOISEFILE database to calculate the noise levels caused by aircraft events at specified grid points in the airbase vicinity. The output of NMAP is a series of geo-referenced data points, specific grid point locations, and corresponding noise levels.
- NMPLOT is the program for viewing and editing the sets of geo-referenced data points. NMPLOT plots the NMAP output in a noise contour grid that can be exported as files that can be used in mapping programs for analyzing the noise impacts



AIR FORCE PLANT 42
CALIFORNIA

**CHAPTER 2 • INSTALLATION
DESCRIPTION**

AIR INSTALLATION COMPATIBLE USE ZONE



2.0 INSTALLATION DESCRIPTION

2.1 Location, Geography, and Airspace

Air Force Plant 42 is located in the City of Palmdale, California, a mid-sized city located in the Antelope Valley region of northern Los Angeles County, in southern California. The base itself is in the northern portion of the city of Palmdale near the southern boundary of the city of Lancaster (Figure 2-1). Palmdale and Lancaster are located in the western tip of the Mojave Desert north of the San Gabriel Mountains; the topography of the area is characterized as high desert with very little variation in terrain until the desert abuts the mountain ranges.

The weather is influenced by the terrain with the mountains south and west of Palmdale with act as a rain shield for moisture flowing from the Pacific Ocean. The climate is arid with less than 10 inches of rainfall annually; precipitation varies seasonally in that a monsoonal flow occurs in the winter accounting for the bulk of the annual precipitation. Rain is very rare during other times of the year. One result of an arid climate is that daily temperature swings between the high and the low are more pronounced than those that would occur in a more humid location. Summer high temperatures routinely exceed 100° F and lows during winter months often drop into the 20's. Prevailing winds are from the southwest and west.

The population of California and Los Angeles County continues to grow rapidly, as it has for over half a century. This growth is expected to continue for the foreseeable future. Current projections indicate that the population residing in Los Angeles County, which surrounds Plant 42, will increase between 2010 and 2020 of approximately 12.4%. In Palmdale and Lancaster, the projected percentage increases are expected to be 68.6% and 29.2%, respectively. This compares to a statewide projected rate of population growth of 15.6% between 2010 and 2020 (Table 2-1).

AICUZ AIR FORCE PLANT 42

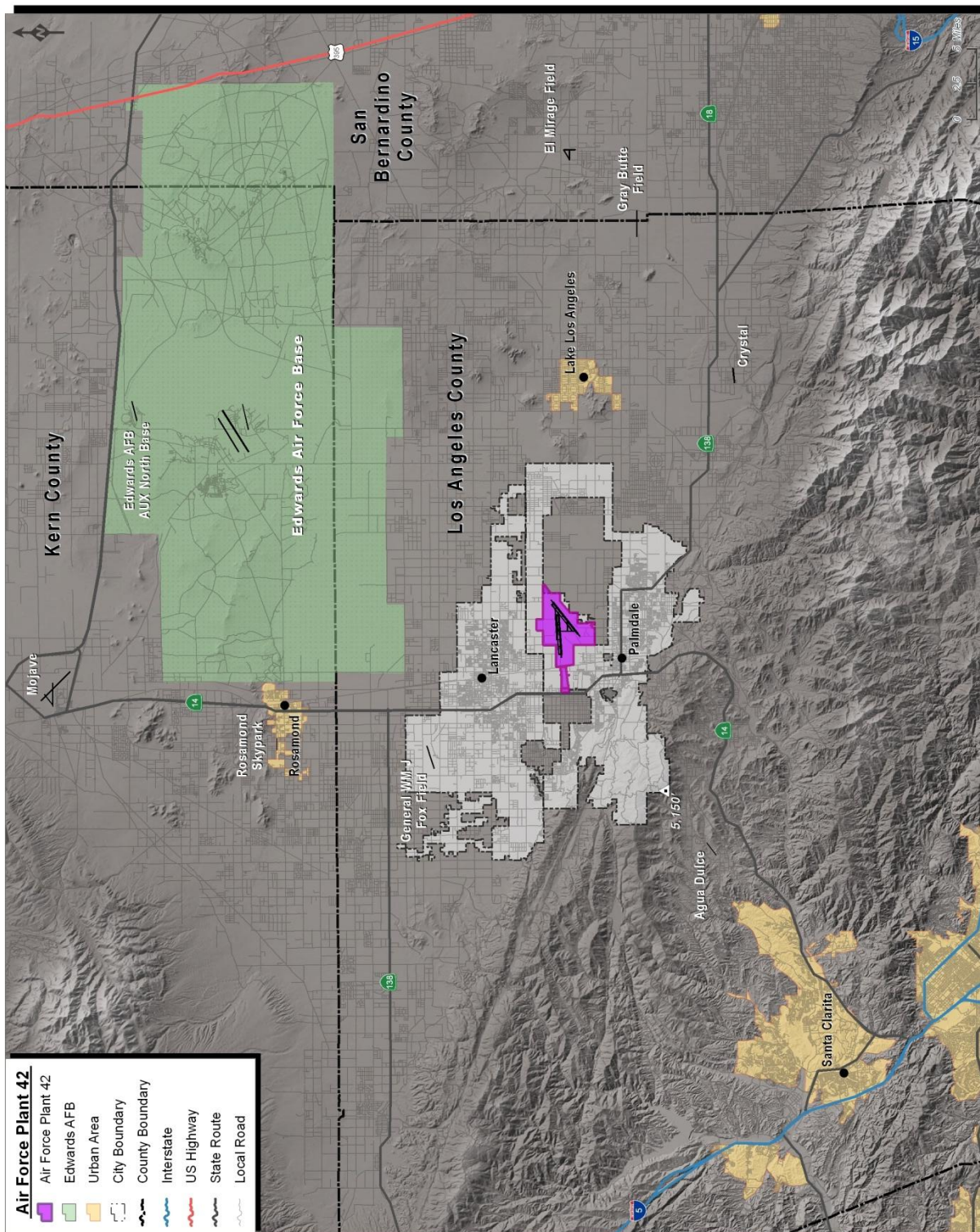


Figure 2-1. US Air Force Plant 42 Vicinity

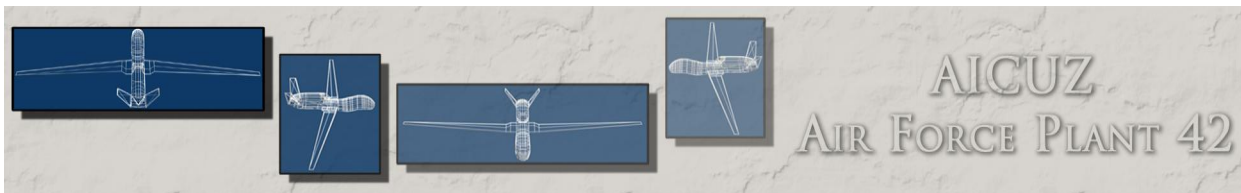


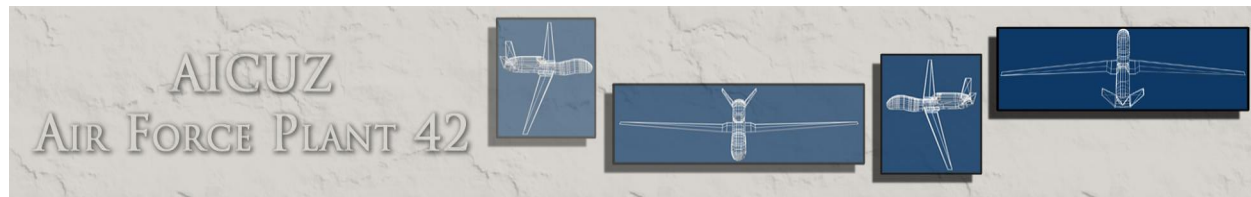
Table 2-1. Population and Projection

| Jurisdiction | 1990 | 2000 | 2010 | 2020 (Projected) | Projected Percentage of Growth |
|---------------------|-------------|-------------|-------------|-----------------------------|---|
| State of California | 29,760,021 | 33,871,648 | 37,253,956 | 44,135,923 | 15.6% |
| City of Palmdale | 68,842 | 116,573 | 152,750 | 257,546 | 68.6% |
| City of Lancaster | 97,291 | 118,783 | 156,633 | 202,407 | 29.2% |
| Los Angeles County | 8,863,164 | 9,519,338 | 9,818,605 | 11,214,237 | 12.4% |
| Kern County | 543,477 | 661,645 | 839,631 | 1,086,113 | 29.4% |

Source: US Census Bureau (1990, 2000, and 2010 data); California Department of Finance (Population Projections 2000-2050); Southern California Association of Governments, 2004 Regional Transportation Plan Growth Forecasts; Greater Antelope Valley Economic Alliance 2011 Economic Roundtable Report

Major surface transportation corridors extend through the region, including California Highway 14, a commuter rail line (MetroLink) with service to Santa Clarita, the San Fernando Valley and Los Angeles basin cities, and, a main line of the Union Pacific railroad for freight service. Both Palmdale and Lancaster are station stops for the MetroLink commuter rail service. Palmdale is projected to be a station stop along a generally north/south high-speed rail network that the State of California is studying and for which it has obligated initial funding; this segment of the network would connect Los Angeles to Bakersfield.

Commercial air carrier service to the region is provided at airports in Los Angeles (LAX), Burbank (BUR), and Ontario (ONT). The Los Angeles World Airports (LAWA) authority, in addition to operating LAX and ONT, also operated an air terminal for scheduled air carrier service in Palmdale. A Joint-Use agreement between the Air Force and LAWA has been in place since 1989 allowing domestic commercial service to use the airways at Plant 42. The air terminal building, access road and associated facilities, located on the west side of the airfield, still exist although no scheduled air carriers currently serve Palmdale. LAWA also is a significant land owner around Plant 42; land containing 17,750 acres east of Plant 42 is largely undeveloped and open and is available for development of a large-scale commercial airport should population growth in the region and demand for scheduled air carrier service warrant it. Although this would tend to relieve some of the operational pressures on LAX and ONT, historical and short term future demand for such an airport has



not developed. With respect to military and general aviation, nearby airfields include Edwards AFB (19 nautical miles [nm] northeast); Rosamond (15 nm north); General William Fox (9 nm northwest), and Aqua Dulce Airpark (14 nm southwest).

2.2 Plant 42 Airfield Infrastructure

The base has approximately 5,800 acres of property, with a runway complex consisting of two runways (4/22 and 7/25), parallel and intersecting taxiways, and several ramp areas for aircraft parking. The airfield elevation is 2,543 feet above mean sea level (MSL). Runway 4/22 is 12,001 feet long by 150 feet wide and is oriented along a northeast-southwest axis; runway 7/25 is 12,002 feet long by 200 feet wide and is oriented along an east-west axis. Operations predominantly occur from east to west along Runway 25 although there is some seasonal variation when winds favor different runways. In addition to the intersecting runways, a portion of one of the parallel taxiways is designed to accommodate short field takeoffs and landings, simulating an assault strip for training purposes. Standard airfield lighting and ground based navigation transmitters associated with instrument landing systems allow approaches during periods of low cloud ceilings or visibility; additionally, a ground based transmitter for en route civil and military navigation (very high frequency omnirange, tactical air navigation [VORTAC]) providing distance and bearing to/from the station is located on the airfield. Finally, with the advent of global positioning system (GPS) technology, departure and approach procedures that do not rely upon terrestrial based transmitters have been developed and serve Plant 42.

The term “National Airspace System” (NAS) refers to a complex network of air navigation facilities, air traffic control facilities, airports, technology, and appropriate rules and regulations. Aircraft operate within the NAS (and become subject to Federal Aviation Regulations) once they begin taxiing from their parking space with the intent to takeoff.

Intersecting taxiways connect the runways to the aircraft parking areas, allowing for assigned aircraft to taxi to their respective ramps and hangers. Several tenant contractors (aircraft manufacturers) and the National Aeronautics and Space Administration (NASA) have significant hangar facilities and direct taxiway access; these corporations and agencies either own or lease facilities on or near the installation. Aircraft maintenance and static engine runs occur at their respective parking areas, at the ends of the runways, or in test cells or hush houses located at some of the tenant facilities (Figure 2-2).

The airfield at Plant 42 lies within controlled airspace, specifically the Class D airspace associated with the air traffic control (ATC)

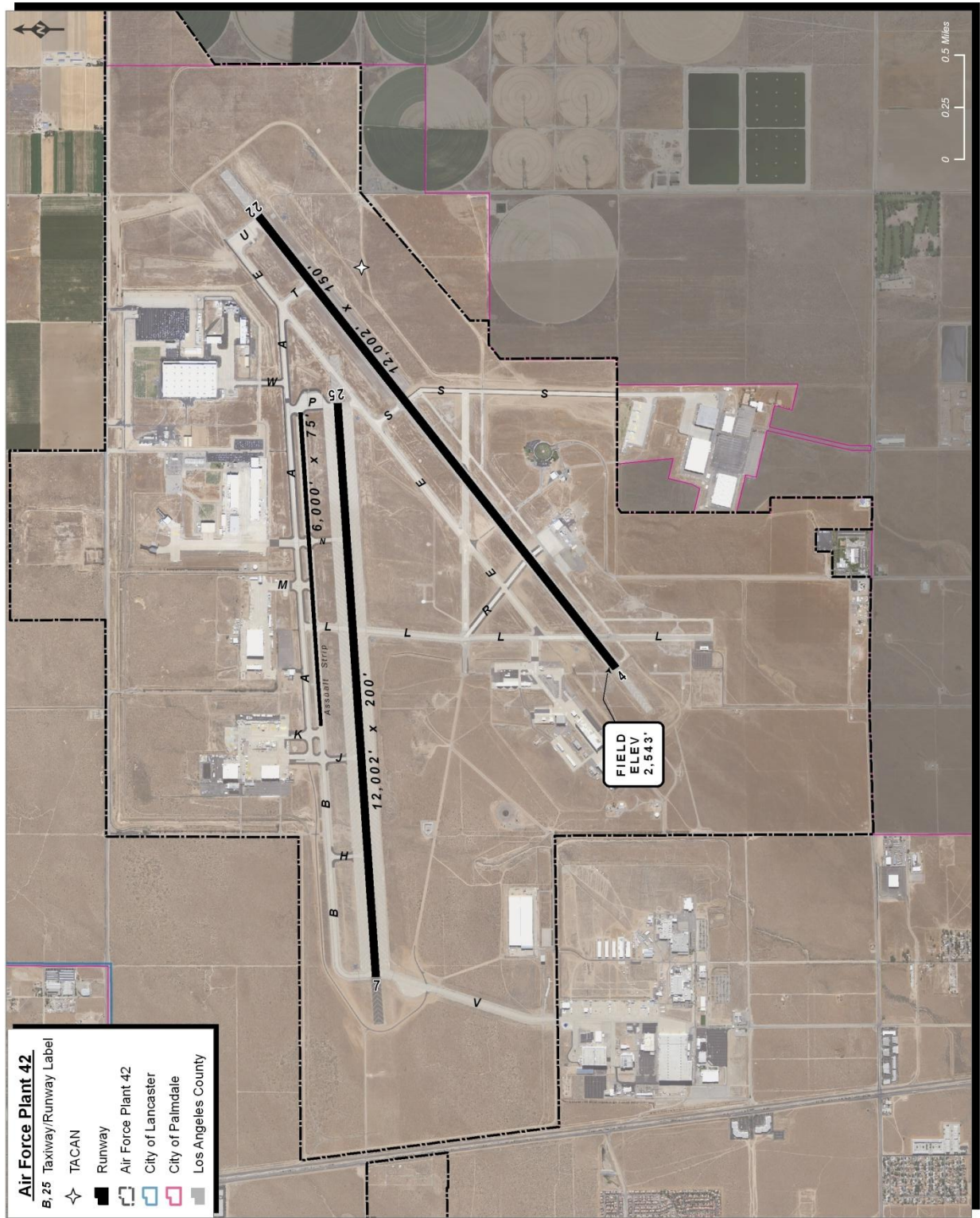
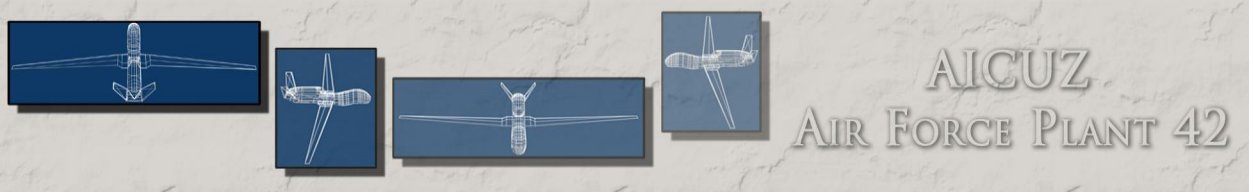
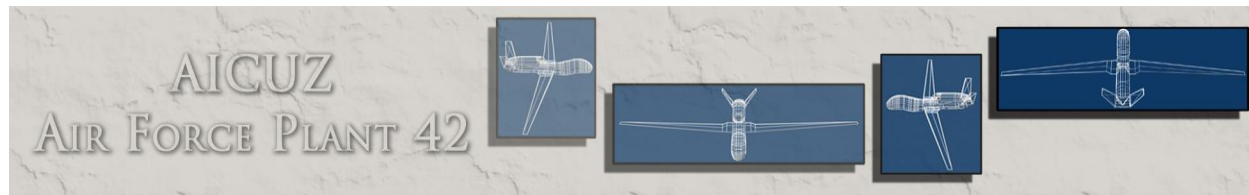


Figure 2-2. Airfield and Installation Layout

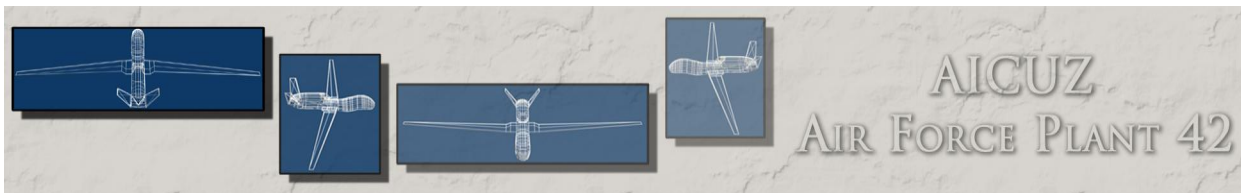


tower at Plant 42. This airspace extends outward from the center of the airfield 4.3 nm and upward from the surface to 5,000 above MSL (approximately 2,500 feet above ground level [AGL]). The term controlled airspace refers to airspace within which aircraft separation (i.e., ATC) is provided by the FAA or Air Force controllers. Separation of aircraft is achieved through a combination of a terminal radar approach control (TRACON) facility at Edwards AFB operated by the FAA and a control tower at Plant 42 also operated by the FAA. Access to this airspace requires establishing two-way communication prior to entry. The communication requirement allows ATC to provide in-flight separation service to aircraft operating instrument flight rules (IFR), permitting operations to occur during periods of less favorable weather as well as runway separation service (clearance to land or take off) to aircraft operating under Visual Flight Rules (VFR) during periods of good weather. Other controlled airspace in the area includes Class D areas of similar size and shape associated with the control towers at General William Fox airport and Edwards AFB. Outside those areas, the airspace generally overlying the region that is either 700 or 1,200 feet AGL to 17,999 feet above MSL lies within Class E airspace. No specific communication requirement exists for traffic operating under VFR in Class E airspace; however, during periods of less favorable weather, operations must be conducted under IFR with specific clearance, communications, equipment, and pilot certification requirements prior to entry.

Apart from airspace designated for purposes of providing air traffic control services, the FAA designates special use airspace to segregate activities that may be hazardous (Restricted [R-] Areas) or have unusual levels or types of flight maneuvers (Military Operations Areas [MOA]). The nearest special use airspace to Plant 42 are the Restricted Areas and MOAs associated with Edwards AFB.

The FAA classifies airspace based on whether it provides ATC. Separation services are provided to aircraft operating under Instrument Flight Rules. Controlled Airspace (further subdivided into Class A, B, C, D or E) is airspace within which ATC separation service is provided; Class G is uncontrolled airspace; no ATC separation is provided. The airspace around Plant 42 is a mix of Class D, E, and G airspace. Of these three types, Class D is the most restrictive, requiring all aircraft to establish two-way communications prior to entry.

In addition to controlling local traffic in the immediate vicinity of the airfield with Air Traffic Control Towers at Plant 42, General William Fox airport, and Edwards AFB, air traffic services are provided while in the region and en route. Within the Palmdale/Edwards AFB region, air traffic control service is provided by the High Desert Terminal Radar Approach Control, located on Edwards AFB. For aircraft transiting the area at higher altitudes, such as scheduled air carrier traffic going between Los Angeles and Atlanta, air traffic control service is provided by one of the approximately 20 Air Route Traffic Control Centers (ARTCC). The area of jurisdiction of an ARTCC is quite large; for example, aircraft operating at high altitudes over the west coast states of California, Oregon and Washington would be controlled by Los Angeles Center, Oakland Center, or Seattle Center. The ARTCC for the southern half of California and parts of Arizona, Nevada, and Utah (LA Center) is in fact in Palmdale near main entrance to Plant 42.



2.3 History of Air Force Plant 42

Plant 42 was officially established in 1953 to address the challenge of flight testing high performance jet aircraft away from heavily populated areas. The first lease with a private aircraft manufacturer was signed in 1956. Since then the facility has supported the production, engineering, final assembly, and/or flight testing of multiple airframes such as the B-1 and B-2 bombers, F-5E and F-117 fighters, the SR-71, and the U-B/TR-1. Additionally, the Space Shuttle orbiters were initially assembled and received mid-lifecycle refurbishments at Plant 42.

The history of Plant 42 begins during World War II when then Palmdale Airport was activated as Palmdale Army Air Field as an emergency landing strip and B-25 training. At the end of that war, the base was declared as surplus and sold to Los Angeles County for use as a municipal airport. In 1950, the Air Force reactivated the installation for the final assembly and flight testing of jet aircraft. In 1951, the Air Force purchased Plant 42 as a means to have a facility for the testing of high performance aircraft away from heavily populated areas. The Air Force envisioned Plant 42 as a facility that would meet the requirements for full war mobilization and expand the major aircraft manufacturing industry of southern California. The installation was officially designated Air Force Plant 42 in 1953 and ownership was transferred to the Federal Government the following year. In 1956 Lockheed signed the first lease to use Plant 42 as a final assembly and testing facility. Plant 42 has supported such projects as: Lockheed's production of the U-2/TR-1 *Dragon Lady* and SR-71 *Blackbird* support; Northrop's production of the F-5E *Tiger II* for foreign military sales; and, support of the Rockwell B-1B *Lancer* bomber. The final assembly and modification of the B-2 *Stealth* bomber occurred at Northrop Grumman's Plant 42 facility.

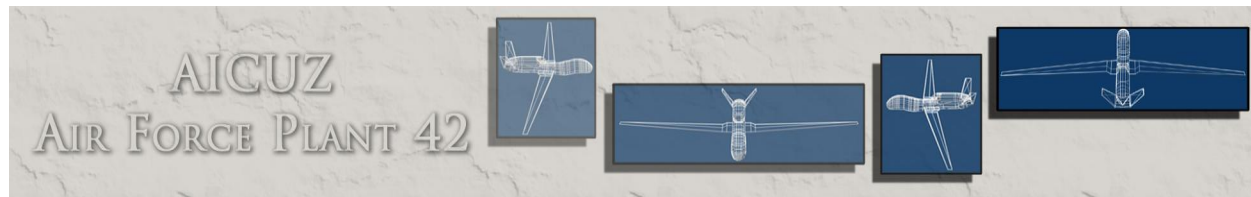
2.4 Mission

The Aeronautical Systems Center is the largest product center for the Air Force Materiel Command. It is located at Wright-Patterson AFB and is primarily responsible for the design, development, and delivery of aerospace weapon systems and capabilities for the Air Force, other U.S. military, allied and coalition-partner warfighters, in support of Air Force leadership priorities.

Detachment 1 of the Aeronautical Systems Center, a Product Center for the Air Force Materiel Command (AFMC) at Wright-Patterson AFB, Ohio, is the host unit for Plant 42 and is responsible for installation operations, including the airfield. The Plant 42 installation consists of eight separate production sites that share a common airfield infrastructure. The primary mission at Plant 42 is to provide and maintain facilities for:

- The final assembly of jet-powered, high performance jet aircraft;
- Production engineering and flight test programs; and
- Air Force acceptance flight test of jet aircraft.

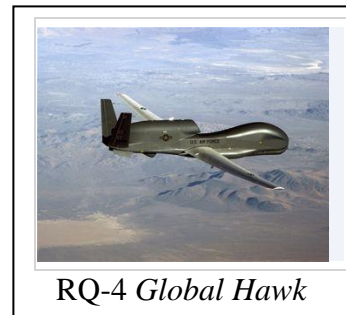
Currently, Plant 42 supports the major aircraft manufacturers Boeing, Lockheed, and Northrop Grumman. NASA also maintains a production facility on the installation. The aircraft manufacturers perform final assembly and testing of both military and commercial airframes at Plant 42, while NASA's mission includes test and research applications. Plant 42 is also Northrop Grumman's



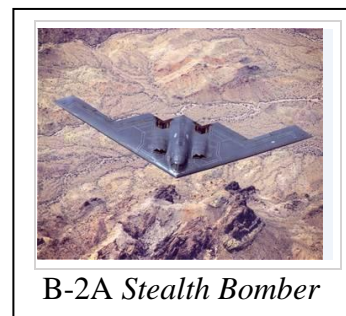
maintenance depot for B-2 *Stealth Bomber* test and inspection. Because of the transitory nature of the missions of each tenant on Plant 42, the number and type of aircraft stationed at Plant 42 is highly variable. Both the aircraft manufacturers and NASA have some permanently assigned aircraft used for training and transportation. In addition to these aircraft, they also support various other airframes for a range of timeframes during their final assembly and acceptance testing, or for depot maintenance and inspection period.

Predominant Aircraft Types Using Plant 42

The RQ-4 *Global Hawk* is a high-altitude, long-endurance unmanned aircraft system (UAS) with an integrated sensor suite for worldwide intelligence, surveillance, and reconnaissance (ISR) capability. *Global Hawk* began as an Advanced Concept Technology Demonstration in 1995 and was determined to have military utility for providing evolutionary high-altitude, long-endurance ISR capability. It was first deployed operationally in November 2001 to support the global war on terrorism. Mission parameters can be programmed into the RQ-4 enabling it to autonomously taxi, take off, fly, and loiter above an area to gather intelligence, return, and land. Ground-based operators monitor and can update/change mission parameters during flight if required.

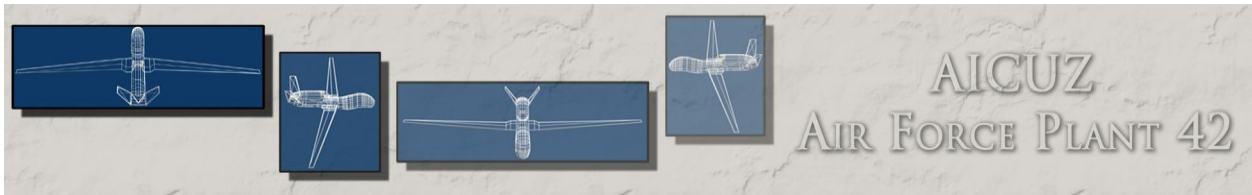


The B-2A *Stealth Bomber* was first rolled out of Northrop’s assembly facility in Palmdale, CA on November 22, 1988 with its first flight occurring on July 17, 1989. It is designed for multiple missions such as deep strike penetration against heavily defended targets. It uses sophisticated low-observable technologies to give the aircraft a very low radar cross section, has an unrefueled range of greater than 6,000 miles, carries a 40,000 lb payload, and delivers near-precision munitions. The B-2A has four General Electric F118-GE-100 (non-afterburning) turbofan engines, each producing 17,300 lbs of thrust.



The U-2S *Dragon Lady* is a single seat, single engine aircraft that provides high-altitude/near space reconnaissance and surveillance. Its long and narrow wings give it glider-like characteristics allowing it to attain unmatched altitudes and loiter there for extended periods of time. The U-2 is capable of obtaining a variety of imagery such as multi-spectral electro-optic, infrared, and synthetic aperture radar products which can be stored or sent to ground exploitation centers. In addition, it also supports high-resolution, broad-area synoptic coverage provided by the optical bar camera. A lightweight, fuel efficient General Electric F118-101 engine powers the U-2, and





allows for long duration missions without the need for air refueling. The U-2 first began flying missions in the late 1950s over the Soviet Union. All U-2s have been upgraded to the current S-version, beginning in 1994.



C-130 *Hercules*

The C-130 *Hercules* provides tactical airlift for the Air Force. The aircraft is capable of operating from a multitude of environments and is the prime transport for air dropping troops and equipment into hostile areas. The C-130J is the latest addition to the *Hercules* fleet, replacing the C-130E's. The C-130J integrates state-of-the-art technology such as fully integrated digital avionics, multifunctional liquid crystal and head-up displays, navigation systems with GPS, fully integrated defense systems, low-power color radar, and improved fuel, environmental and ice-protection systems. Four Rolls-Royce AE2100D3 turboprop engines with a six-bladed composite propeller provide substantial performance improvements.

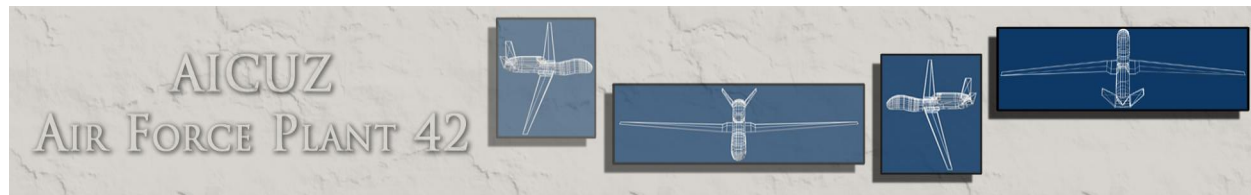


F-22 *Raptor*

The Plant 42 airspace and airfield is also heavily used by aircraft from other units for tactical training and proficiency sorties. The majority of these sorties are flown by aircraft from the 412 Flight Test Wing (Edwards AFB) and the 146th Airlift Wing (Channel Island ANGB) located on Naval Air Station Point Magu, approximately 60 miles southwest along the Pacific Ocean). From Edwards AFB, a wide variety of aircraft types that are undergoing flight testing and thus are using the facilities and airspace at Edwards AFB will also often use the airfield at Plant 42. These airframe types would include the C130 *Hercules*, the F-15 *Eagle*, the F-16 *Fighting Falcon*, the F-22 *Raptor*, and the T-38 *Talon*. From Channel Islands ANGB, the 146 Airlift Wing operates C-130 *Hercules* aircraft. Other transient aircraft may periodically use the airfield at Plant 42 on a case by case basis, placing additional demands on its future use. For example, the new F-35 is anticipated to use the airfield in the near future.

2.5 Economic Impact

Air Force Plant 42's economic region of influence is generally thought to extend approximately 25 miles, the majority of which is within Los Angeles County, but it does extend into southern Kern County. This area is generally known as the Greater Antelope Valley Economic Area. The general economic health of the region is good and is characterized by a well-diversified economy with manufacturing, retailing, professional, health care, scientific, and



education as the primary industries in the region. These sectors in aggregate provide 54.6 percent of the total jobs in the region (Table 2-2).

The US Census Bureau estimates that the median household income in 2009 inflation adjusted dollars was: \$49,567 (Lancaster), \$54,840 (Palmdale) and \$54,828 (Los Angeles County). This compares to a statewide median household income of \$60,392 and a nationwide median household income of \$51,425 in 2009 dollars.

Apart from physical proximity, numerous factors link Plant 42 with the surrounding communities. The relationship historically has been one of cooperation, mutual respect, and support. Strong ties between the local governments, the business community, and the military have existed for decades. Personnel employed at Plant 42 are actively involved in local affairs, frequently attending city meetings to discuss any Plant 42 issues that could potentially affect the city.

The economic impact of Plant 42 on Antelope Valley is significant, especially within the 25-mile radius of the economic impact region (EIR) generally associated with military installations. In 2010, the military, contractors and other tenants on Plant 42 employed 7,234 personnel. Approximately 15 are uniformed, military personnel. Since there is no base housing on Plant 42, these personnel live in the community or region. The annual total payroll in 2010 for Plant 42 was approximately \$622.9 million, and provided approximately \$133.2 million in local contracts (Table 2-3).

2.6 Flying Activity

Prior to the data collection that occurred in late 2010, the most recent AICUZ study for Plant 42 was accomplished in 2002. Since the previous AICUZ study, the aircraft types based at Plant 42 have changed, adding the B-2 *Stealth* bomber, the RQ-4 *Global Hawk*, as well as Boeing's 747-8 and 747SP models. The installation is no longer supporting the F-117 *Nighthawk* stealth fighter or B-1 *Lancer* bomber.

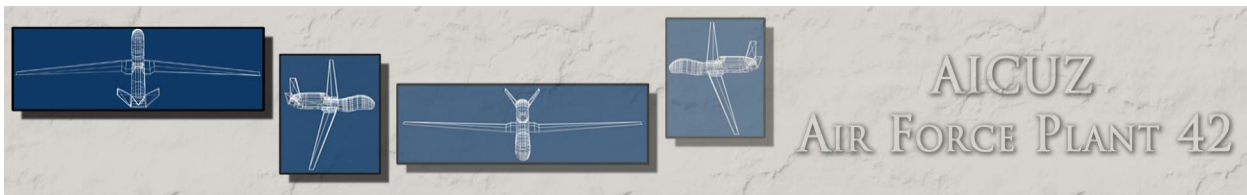


Table 2-2. Total Employment by Industry

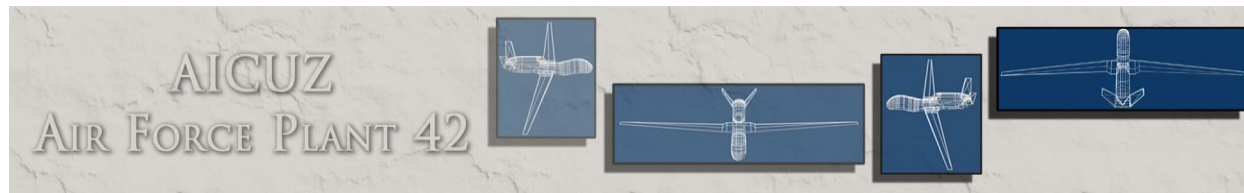
| Sector | 2005-2009 Estimate (# of persons) | | | |
|--|-----------------------------------|-----------|--------------------|-------------|
| | Palmdale | Lancaster | Los Angeles County | Kern County |
| Civilian employed population 16 years and over | 53,910 | 51,189 | 4,522,378 | 297,398 |
| Agriculture, forestry, fishing and hunting, and mining | 409 | 523 | 19,581 | 39,863 |
| Construction | 5,156 | 4,000 | 300,901 | 23,528 |
| Manufacturing | 6,827 | 5,239 | 533,779 | 15,632 |
| Wholesale trade | 1,418 | 1,054 | 181,661 | 10,391 |
| Retail trade | 7,175 | 7,215 | 477,613 | 32,752 |
| Transportation and warehousing, and utilities | 2,697 | 2,546 | 234,904 | 12,376 |
| Information | 1,507 | 1,312 | 200,129 | 4,284 |
| Finance and insurance, and real estate and rental and leasing | 3,519 | 2,974 | 318,809 | 13,969 |
| Professional, scientific, and management, and administrative and waste management services | 4,463 | 4,609 | 536,301 | 24,181 |
| Educational services, and health care and social assistance | 10,049 | 11,805 | 868,940 | 56,683 |
| Arts, entertainment, and recreation, and accommodation and food services | 5,066 | 3,567 | 437,046 | 23,380 |
| Other services, except public administration | 3,088 | 2,535 | 269,706, | 14,460 |
| Public administration | 2,536 | 3,810 | 143,008 | 22,611 |

Source: U.S. Census Bureau, 2005-2009 American Community Survey 5-Year Estimates, 2403

Table 2-3. Plant 42 FY 2010 Estimated Economic Impact

| Source | Economic Value |
|-----------------|----------------|
| Annual Payroll | \$622,864,653 |
| Local Contracts | \$133,209,491 |

Source: Greater Antelope Valley Economic Alliance



The mix of transient aircraft using Plant 42 can and does change from year to year. Transient aircraft generally fall into one of three categories: VIP transport (light business turboprop aircraft, such as the Gulfstream G-3 and Beechcraft C-12 *Huron*), heavy airlift (including cargo aircraft such as the C-130J *Hercules*) or fighter aircraft based elsewhere that are temporarily visiting Plant 42 or using it as an emergency divert field (e.g., F-16 *Fighting Falcon* and F-22 *Raptor*). The number of transient aircraft sorties also varies over time as operational requirements dictate and they represent a large fraction of airfield operations at Plant 42. Flying activities and types of aircraft utilizing the airfield at Plant 42 have changed dramatically since the 1992 and 2002 AICUZ reports, resulting in generally lower operational noise levels.

2.6.1 Flight Operations by Aircraft Type

An operation is defined as one takeoff, one arrival, or half of a closed pattern. A closed pattern consists of both a departure portion and an approach portion (i.e., two operations). In addition to the aircraft types either based at or supported by Plant 42 (B-2, *Global Hawk*, U-2S, B747-8, and B747SP), transient aircraft from other military installations often land and take off at Plant 42.

While the number of assigned, transient, and civil aircraft operations varies from day to day at an installation, the NOISEMAP computer program requires input of a specific number of daily flights and of aircraft maintenance engine run-up operations. For purposes of an AICUZ study, the “average busy day” is modeled in recognition that the level of flight operations can vary over the course of a year (Table 2-4). For example, at most bases, weekend flying operations are typically much less common. The use of an average busy day concept simply entails normalizing the data so that they are representative of the activity occurring when the Plant 42 is flying (i.e., less frequently on holidays and weekends).

A sortie is a single military flight from initial takeoff to its terminating landing. A sortie consists of at least two operations (a takeoff and a landing) and often additional circuits in the traffic pattern, called closed pattern operations. Closed patterns are counted as two operations because they include a departure and an arrival.

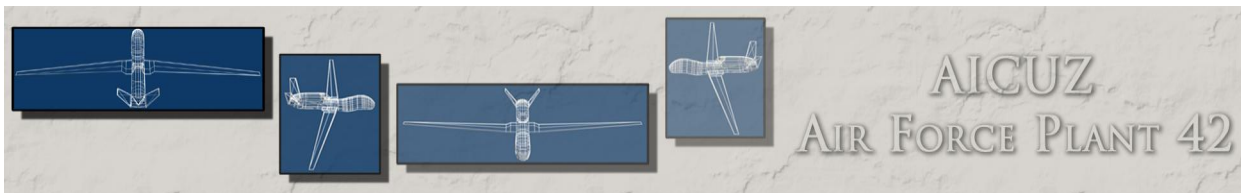
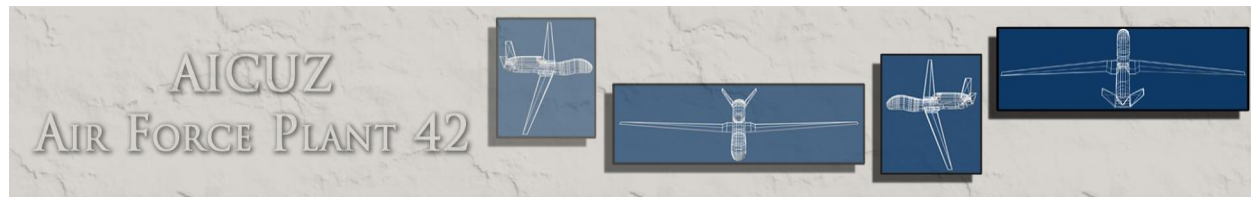


Table 2-4. Average Busy-Day Aircraft Operations at Plant 42 during FY10

| Aircraft Type | Flying Days per Year | Average Daily Operations | Average Annual Operations |
|--------------------------------------|-----------------------------|---------------------------------|----------------------------------|
| Plant 42 | | | |
| B747-8F | 350 | 2.40 | 840.00 |
| U-2S | 250 | 1.92 | 479.64 |
| RQ-4 Global Hawk | 250 | 0.34 | 84.00 |
| C-12 | 250 | 0.34 | 84.00 |
| B-2 | 250 | 0.22 | 54.00 |
| B747SP (SOFIA) | 260 | 0.38 | 100.00 |
| ER-2 | 260 | 1.18 | 306.00 |
| DC-8 | 260 | 0.96 | 250.67 |
| F-22 (Depot FCF) | 260 | 0.12 | 30.00 |
| F-22 (Depot) | 260 | 0.14 | 36.00 |
| Channel Islands ANGB (146 AW) | | | |
| C-130 | 260 | 43.20 | 11,231.35 |
| Edwards (412 FTW) | | | |
| C-12 | 252 | 12.19 | 3,072 |
| F-22 (411 FTS) | 260 | 0.35 | 90.00 |
| T-38 (TPS) | 260 | 28.00 | 7,280.00 |
| F-16 | 260 | 2.95 | 768.00 |
| KC-135 | 260 | 18.00 | 4,680.00 |
| C-130 | 260 | 1.90 | 495.24 |
| Transient | 365 | 8.83 | 3,224.00 |
| TOTAL | | 123.42 | 33,104.90 |



2.6.2 Flight Tracks over the Ground

For aircraft stationed at Plant 42 temporarily while undergoing depot maintenance or initial manufacturing and acceptance, the typical sortie consists of: a departure from Plant 42 on the runway heading; a turn toward the test and training airspace over Edwards AFB; air work in the Restricted Area or MOAs over Edwards AFB; and, an arrival back at Plant 42. For aircraft stationed at and arriving from Channel Islands ANGB or Edwards AFB (i.e., proficiency flights), the typical sortie consists of: a departure from either Channel Islands ANGB or Edwards AFB; an initial arrival into Plant 42; a varying number of closed circuit patterns with low approaches or touch and go landings; and, a final departure to return to the base at which the aircraft is stationed.

The flight patterns (also referred to as flight tracks) are designed taking several factors into account and the operations most commonly observed along these tracks are a function of several factors including:

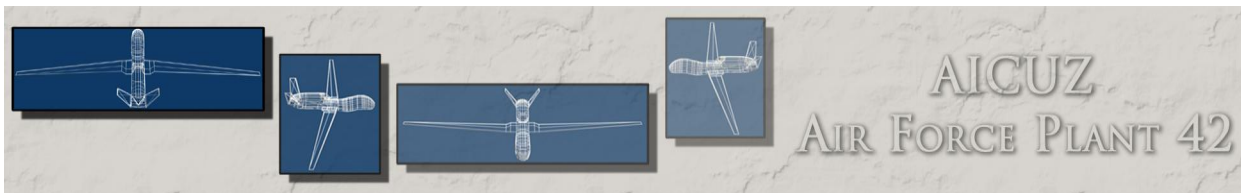
- The prevailing weather conditions, particularly the winds which influences the runway in use at an airfield at any given time;
- The mission or purpose for which the sortie is being flown, and, closely related, the locations of the most commonly used training airspace units;
- Terrain;
- Separation requirements from other aircraft in the vicinity including those in the mid- and upper altitude strata (greater than 10,000 feet above MSL); and
- Noise abatement considerations.

Of these factors, the prevailing winds (which influences whether operations occur on Runways 4/22, or 7/25) and the mission (i.e., what training or operational scenario is being flown to and from which areas) are the predominant factors that influence which of the many flight tracks possible are the ones most commonly observed.

Generally, operations occur from east to west on Runway 25 due to the prevailing winds, noise abatement, and other considerations such as air traffic in the area. It is the preferred calm wind runway.

Military fighter aircraft use an overhead arrival pattern in which the aircraft flies over the arrival end of the runway at pattern altitude (normally 1,500 feet above ground level (AGL), then banks sharply to the left or right, turning to a heading opposite that of the runway in use. This sharp turn is also called a "pitch" or a "break." Using the turn to slow down while holding pattern altitude, the aircraft is then flown parallel to the runway (downwind), configures its flaps and landing gear, and when beyond the threshold of the runway begins a descending turn toward final approach such that the plane rolls out wings-level at the proper airspeed on about a 1 mile final and about 300 feet AGL. This technique minimizes vulnerability to enemy fire and provides additional altitude in the event of aircraft malfunctions.

Civil aircraft ordinarily approach the runway, descending on a more gradual glidepath and seldom overflying the threshold at pattern altitude. The tight turns at high rates of speed that are required in order to stay within the vicinity of the airfield generate G forces beyond the design capabilities of most civil aircraft and would also result in an unpleasant ride for passengers not expecting such a vigorous maneuver.



2.6.3 Runway and Flight Track Utilization

The Federal Aviation Regulations governing aircraft flight operations describe two basic sets of flight rules under which aircraft may be operated: VFR, which requires certain minimum in-flight visibility and cloud ceilings, and IFR, which do not.

For all operations, if sufficient visibility exists, the pilot in command remains responsible for collision avoidance and aircraft separation, this is usually referred to as “see and avoid.” There are times, however, when this technique is impractical and reliance upon it would be inadvisable.

Examples would be flying through a cloud; flying at high speeds and high altitude; or flying in a very congested airspace.

Over the years, IFR has evolved to keep it effective as a separation method. Therefore, the FAA designates ‘controlled airspace’ within which it will provide ATC separation, specifies minimum equipment requirements to facility communications and radar surveillance of aircraft, and requires the filing of IFR flight plans and prior receipt of clearances before undertaking an IFR flight and the adherence to ATC instructions during such flight.

Departures from Runways 22 or 25 (i.e., on a southwesterly or westerly initial heading) typically turn right fairly quickly after departure (within a mile or two), heading generally north or northeastward to enter the Edwards airspace; aircraft heading toward Point Magu or Los Angeles typically proceed direct on course. If limited aircraft performance warrants it, a spiraling departure to gain altitude may occur prior the aircraft’s turning on course and heading toward higher terrain. Aircraft destined toward airfields to the east typically will also turn right off Runway 22 or 25, fly north for a few miles and then turn eastbound.

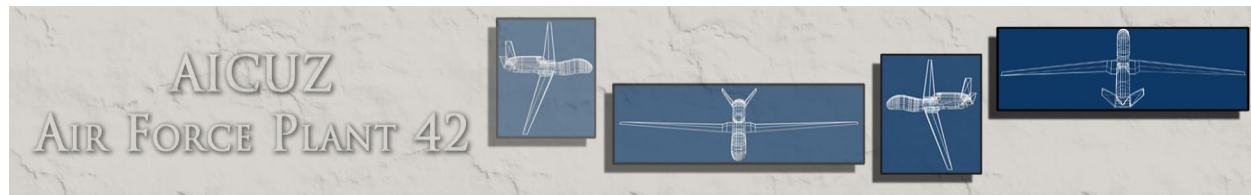
While relatively infrequent, departures from Runway 4 or 7 (i.e., on a northeasterly or easterly initial heading) will typically fly straight out for about three to five miles before turning on course.

For arrivals to Runway 22 or 25, a similar set of circumstances influences the flight tracks observed. Aircraft arriving from the airspace associated with Edwards AFB arrive from the north and join the final approach course (extended centerline of the runway). If conducting an instrument approaches, this join point occurs somewhere around 10 to 15 miles out; if a visual arrival is occurring and traffic permits it, the joint point can be as close as a mile or two although a five mile point is more typical. Aircraft arriving from the Los Angeles area or from the west would ordinarily fly toward the north side of the airfield, parallel to the runways.

As with departures, arrivals to Runway 4 or 7 are infrequent, occurring generally on the north or northwest side, avoiding Palmdale and the rising terrain to the south.

Other factors influencing the flight tracks observed at Plant 42 include:

- Takeoff patterns routed to avoid densely populated areas as much as practicable;
- Air Force criteria governing the speed, rate of climb, and turning radius for each type of aircraft;
- Efforts to control and schedule missions to keep noise levels low, especially at night; and
- Coordination with the FAA to minimize conflict with civilian air carrier and general aviation aircraft operations in the region.



As a result, aircraft operating at Plant 42 use the following basic flight patterns:

- Turning departure (departing Runway 22 or 25 and turning north toward Rosemond to enter the Edwards airspace);
- Straight out departure off Runway 22 or 25 to return toward Channel Islands ANGB;
- Straight in approach (typically used by transient aircraft); and
- Overhead arrival.

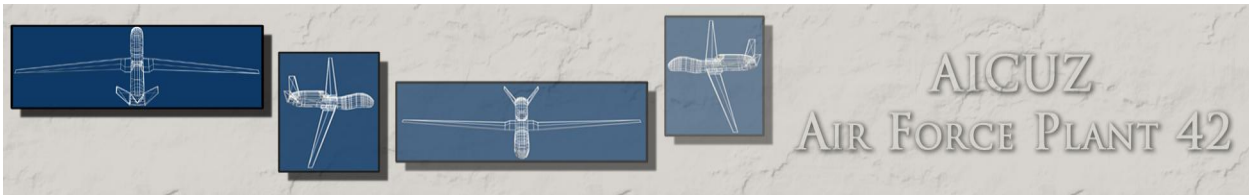
Runway 7/25 and 4/22 departure tracks reflect the varied missions of the aircraft using Plant 42. For example, the F-16 and F-22A tracks generally reflect the need to return to Edwards AFB expeditiously. The Channel Island C-130 flight tracks are designed to facilitate transit between their airfield and Plant 42. The flight tracks used by RQ-4 and the C-12 traffic are designed to deconflict with other aircraft and to take the aircraft toward their test areas. Transient departures taking off to the west (Runway 22 or 25) but destined to the east or south typically turn northward quickly after departure, then eastward for several miles before turning toward their destination to the northeast, east or south.

Normally, departure rolls begin from the runway ends; however, the location of the parking ramps and aircraft performance characteristics may warrant a takeoff roll beginning at the intersection of a taxiway elsewhere. In particular, transient executive transport and light aircraft often do not taxi to the runway ends prior to departure.

Arrivals to Plant 42 include both visual straight-in and overhead approaches to Runways 7/25 and 4/22; the overhead arrival turn away from the runway to the downwind leg (known as a “break” or “pitch”) usually occurs near the runway threshold, but in formation flights, the second ship typically turns about 5 seconds after the first (approximately 3,000 feet after the first ship turns), resulting in a break closer to mid-field. Breaks typically occur on the north side of the runway.

The closed patterns at Plant 42 are normally flown at 1,500 feet AGL by the fighters and heavy aircraft and 1,000 feet AGL by the lighter aircraft. Depending on the purpose of the maneuver, other altitudes are also used. Closed circuit patterns are often used to maintain pilot proficiency because they offer the greatest number of take-offs and arrivals in the shortest period of time.

In order to enhance safety, aircraft flying in the traffic pattern fly at a specified pattern altitude. Usually for light aircraft, this altitude is 1,000 AGL; for heavy aircraft and fighters it is 1,500 AGL. The use of a common altitude makes it easier to spot aircraft along the horizon. Aircraft normally descend from pattern altitude when turning from downwind to a base or final approach segment.



There are many occasions when an aircraft will have its engines running but not be moving; this is called an engine ground run. Aircraft with engines running while waiting to taxi or waiting to take the runway for takeoff are everyday occurrences, as are aircraft that are undergoing maintenance.

Engine ground runs associated with maintenance up to a moderate power setting are normally performed in the squadron ramp space; higher power runs to maximum power levels normally occur in a building specifically designed to attenuate noise (a hush house). Occasionally, a specific area called a trim pad that has blast deflectors and reinforced tie-downs may be used for moderate power runs.

Static engine run-ups are performed at Plant 42, most often in conjunction with maintenance activities. To the maximum extent possible, engine run-up locations have been established in areas that minimize noise exposure for people on-base as well as for those in the surrounding communities. Normal base operations may include a number of late night (after 10 PM and before 7 AM) engine runups.

As noted in the introduction to this report, the area of influence for airfield planning is concerned with three primary aircraft operational/land use determinants: (1) accident potential to occupants on the ground; (2) aircraft noise; and (3) hazards to flight operations from land uses (height obstructions, increased potential for bird-aircraft strike hazards, operations such as factories that emit smoke, dust, or light that adversely affect flight operations). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operation to determine the optimum flight profile for each aircraft type. The flight tracks are the result of such planning (Figures 2-3 – 2-9).

AICUZ AIR FORCE PLANT 42

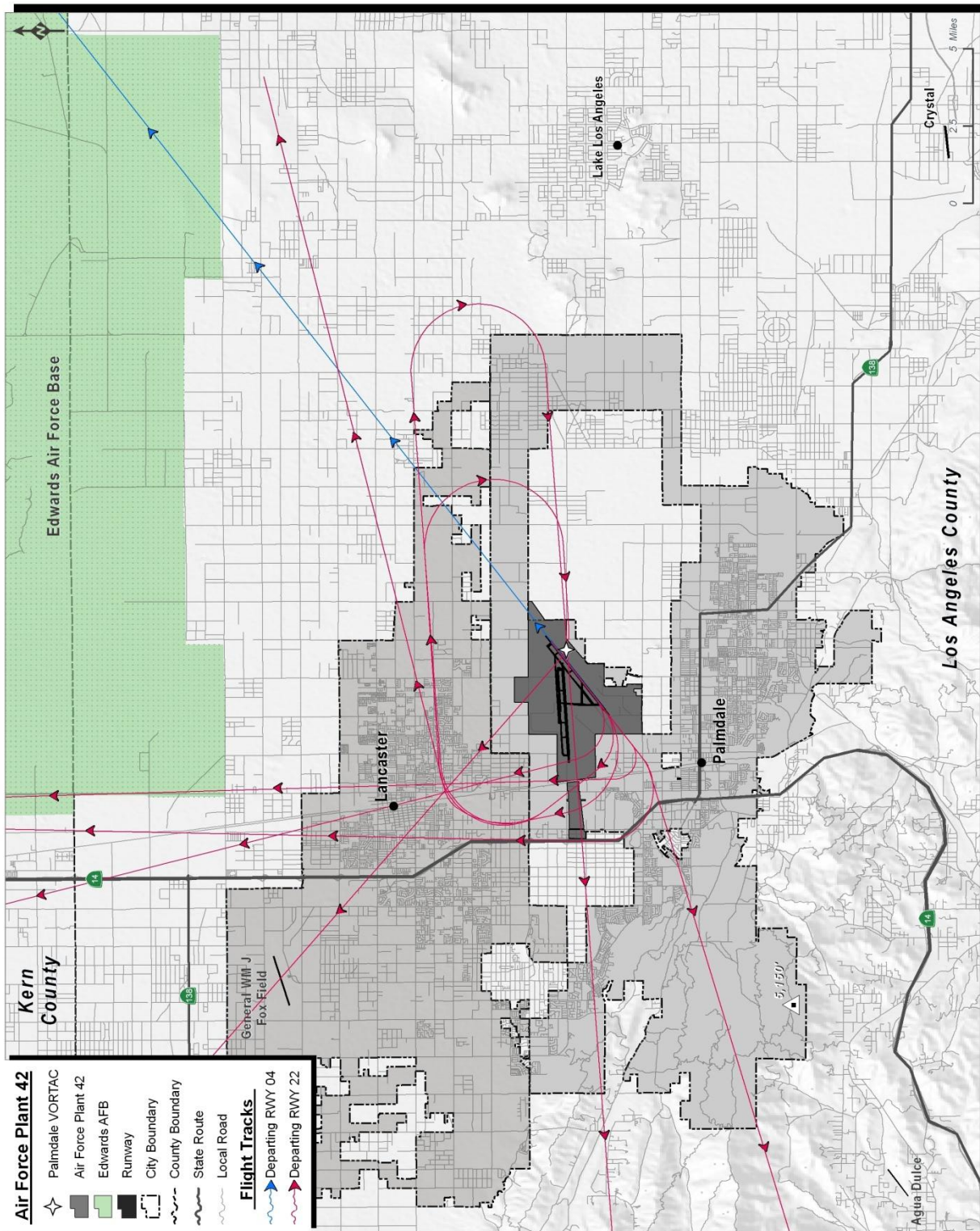
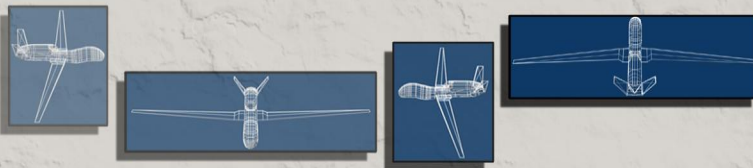


Figure 2-3. Runway 4/22 – Generalized Departure Flight Tracks

AICUZ
AIR FORCE PLANT 42

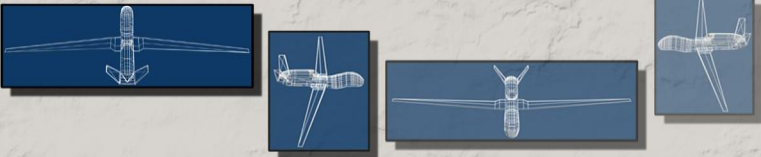
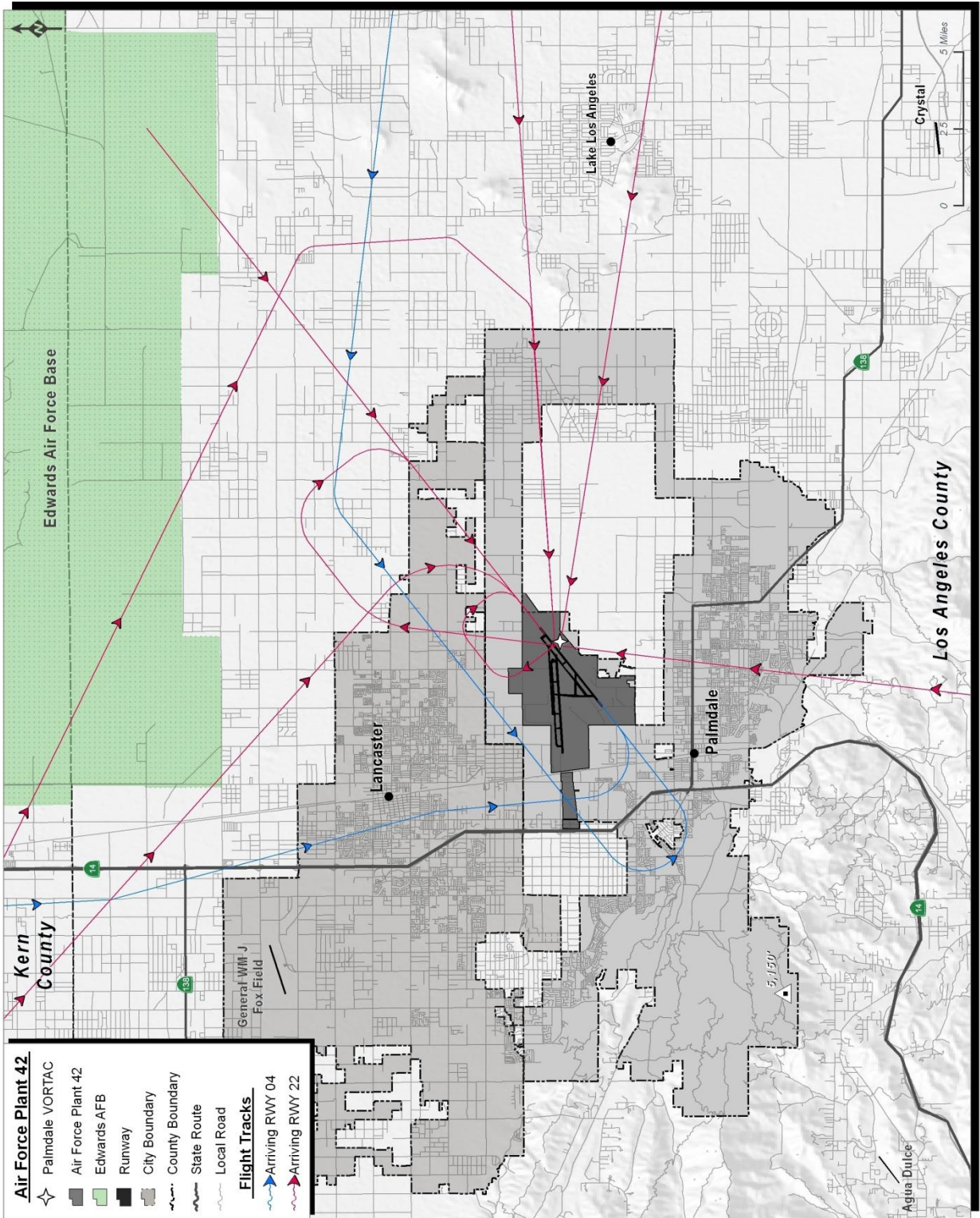



Figure 2-4. Runway 4/22 – Generalized Arrival Flight Tracks

AICUZ AIR FORCE PLANT 42

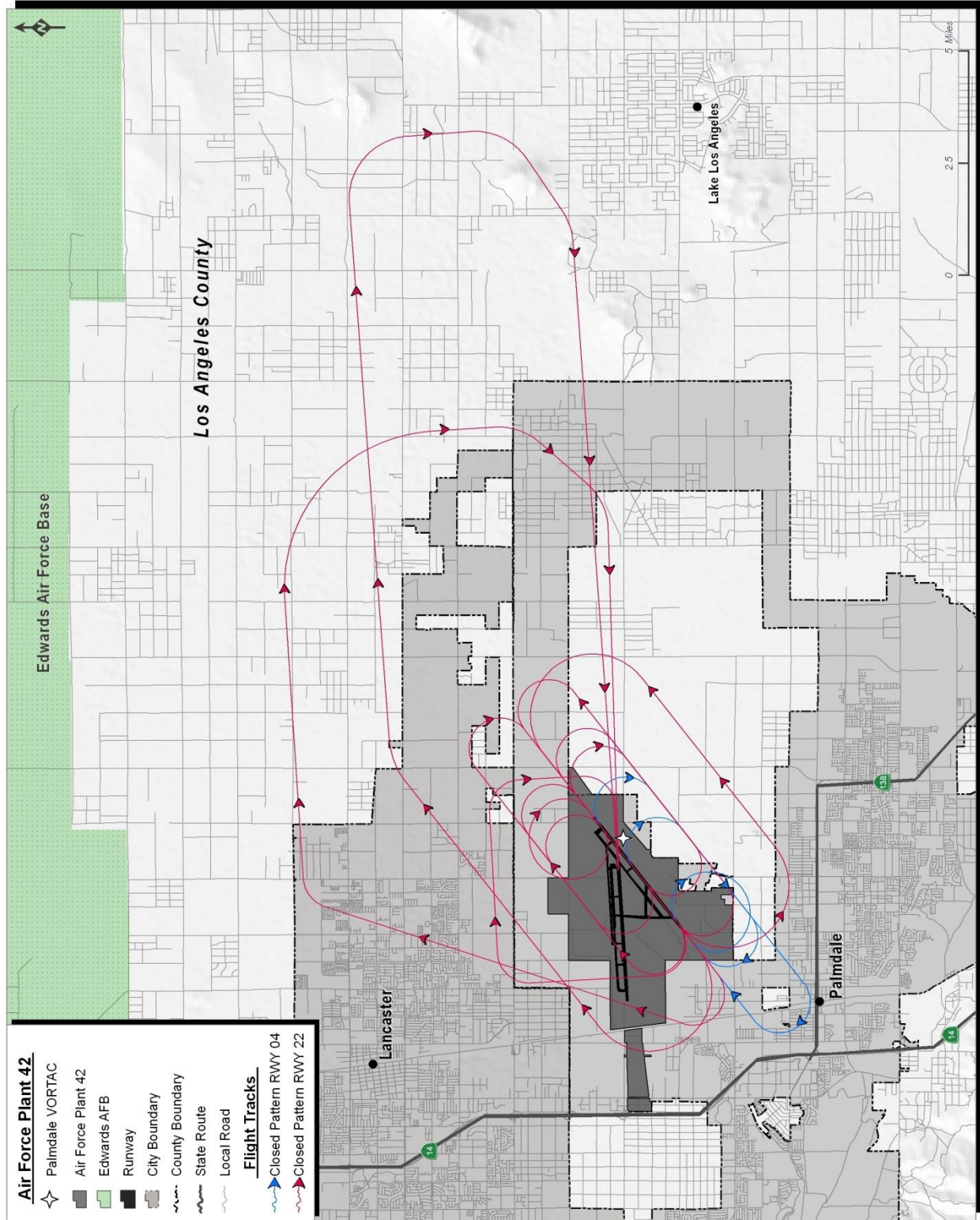


Figure 2-5. Runway 4/22 – Generalized Closed Pattern Flight Tracks

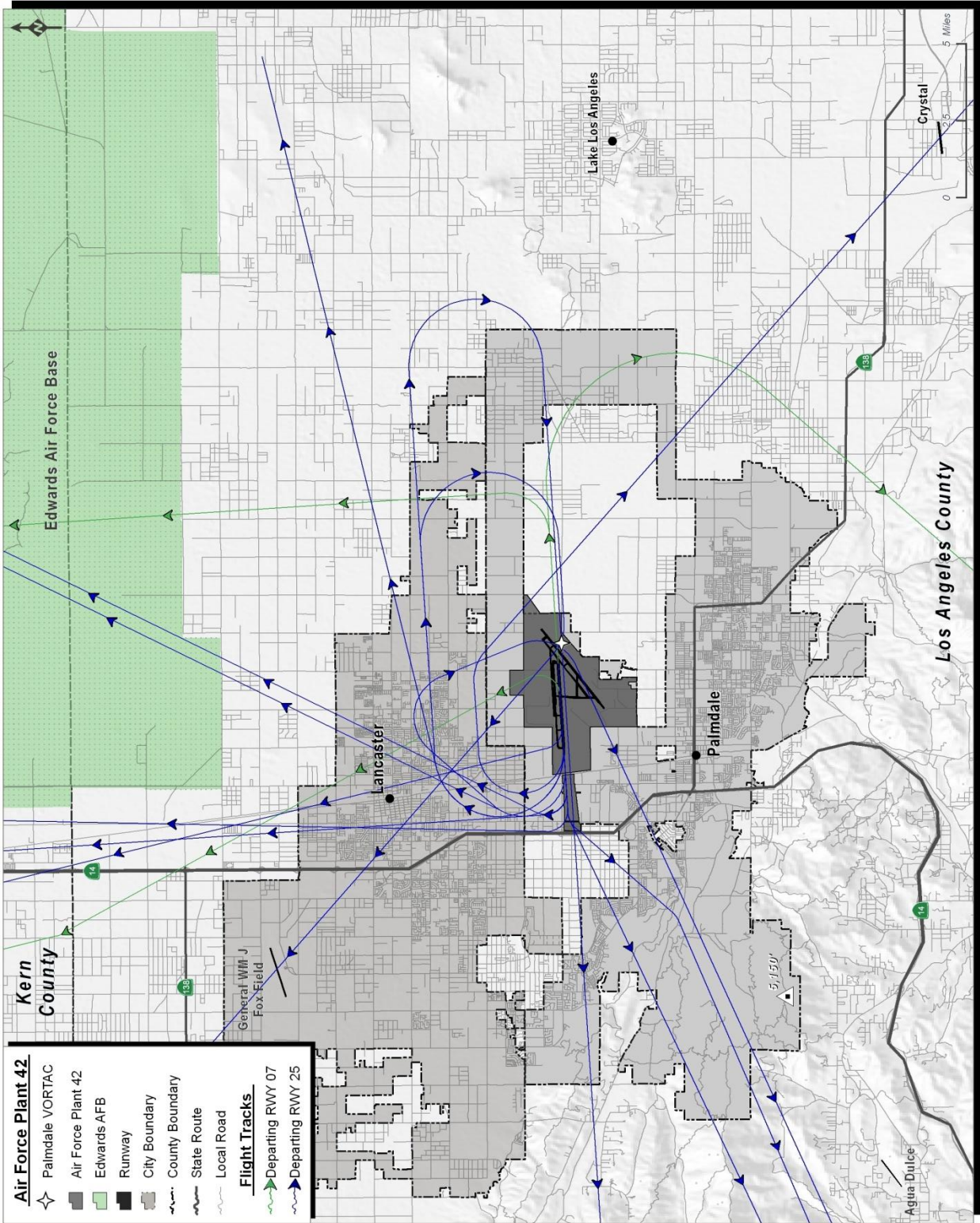


Figure 2-6. Runway 7/25 – Generalized Departure Flight Tracks

AICUZ AIR FORCE PLANT 42

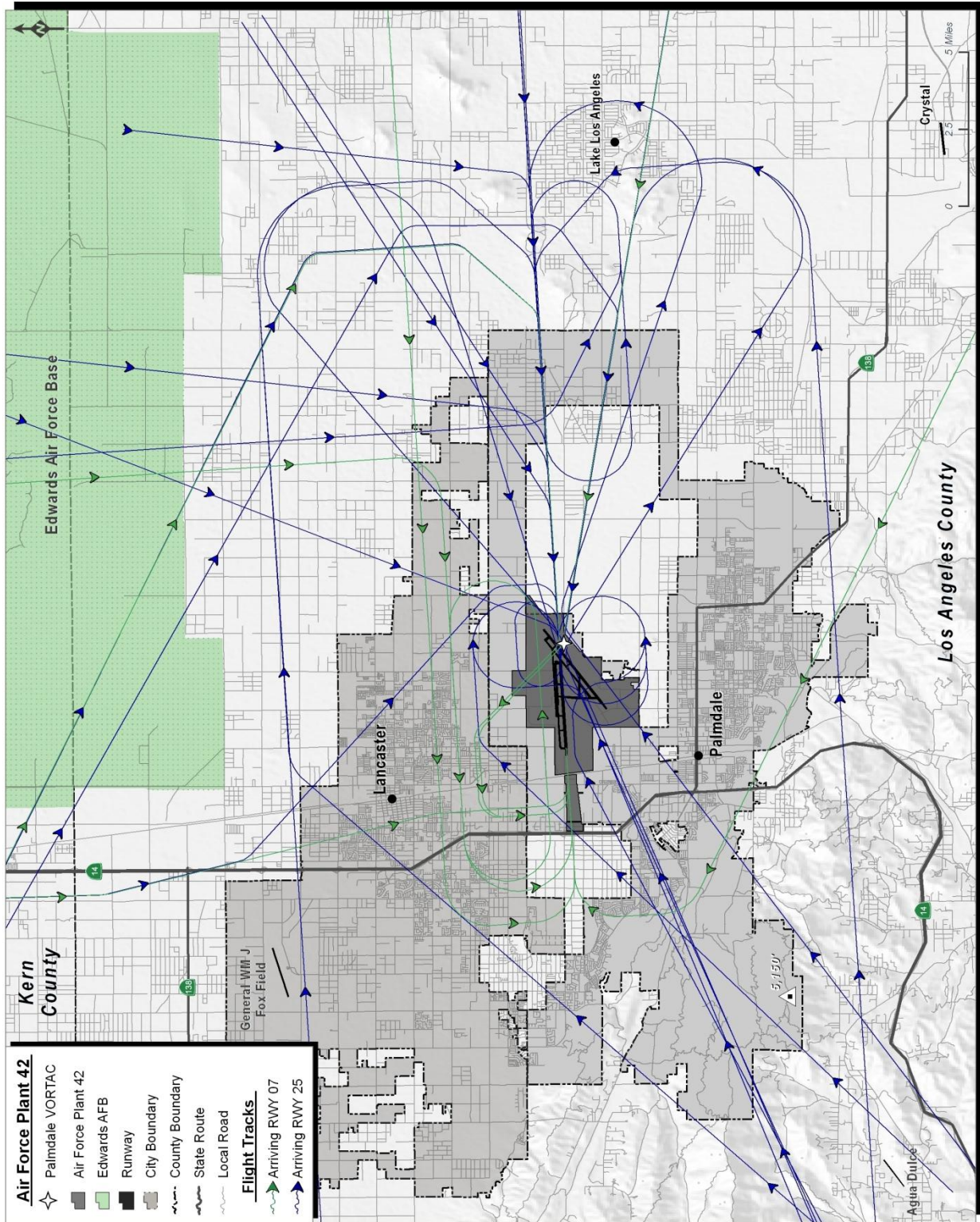
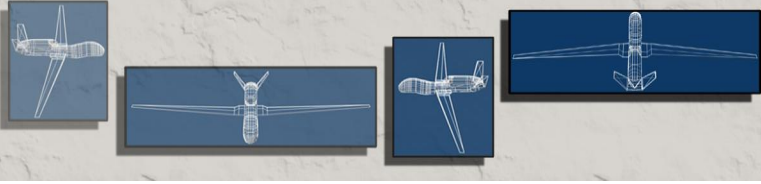
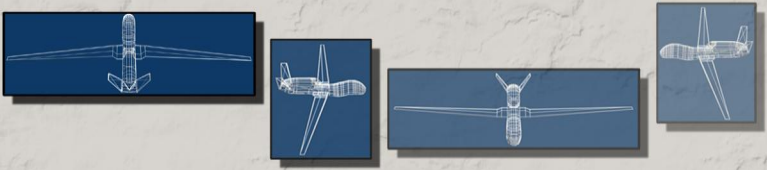


Figure 2-7. Runway 7/25 – Generalized Arrival Flight Tracks



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AIR FORCE PLANT 42

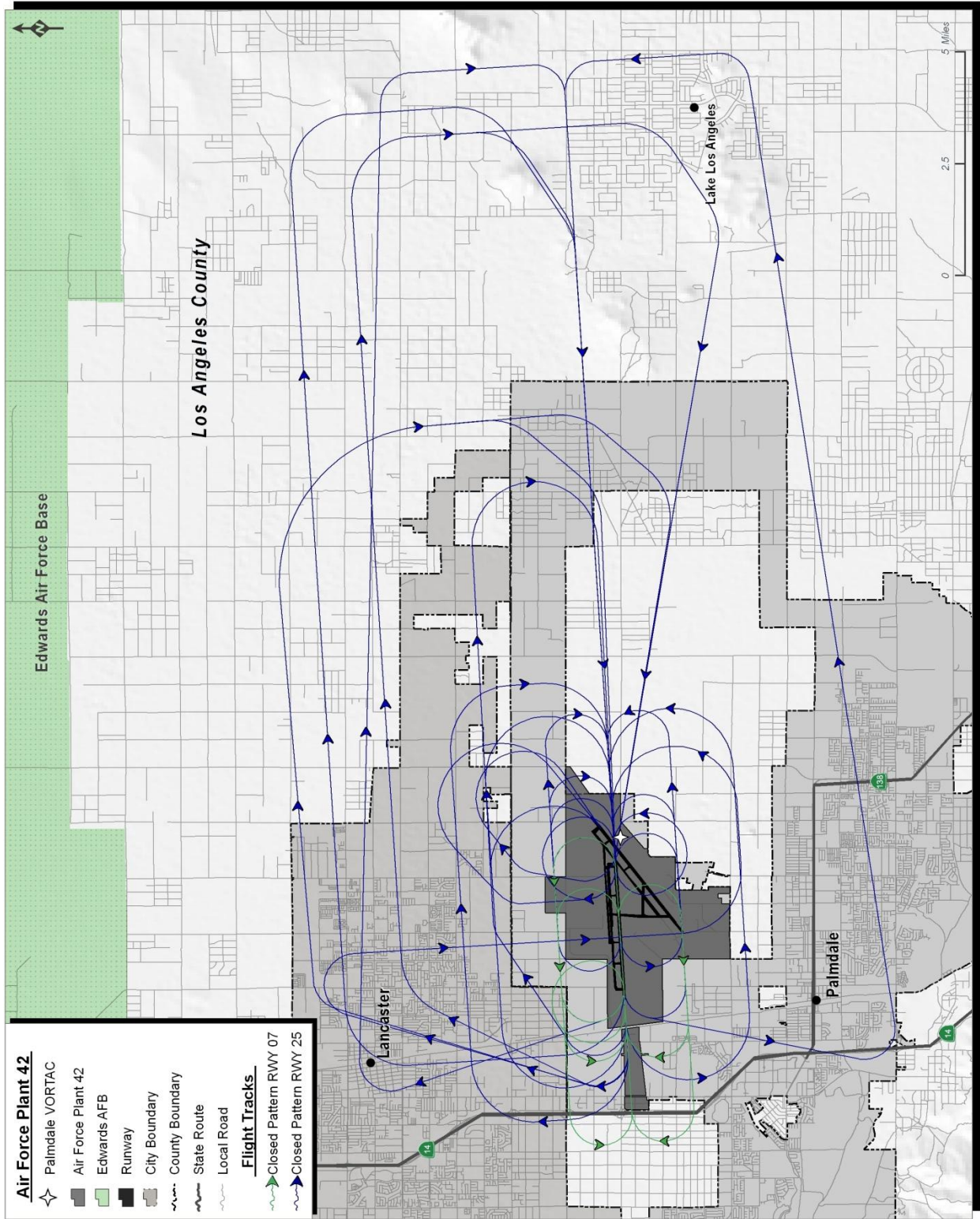


Figure 2-8. Runway 7/25 – Generalized Closed Pattern Flight Tracks

AICUZ AIR FORCE PLANT 42

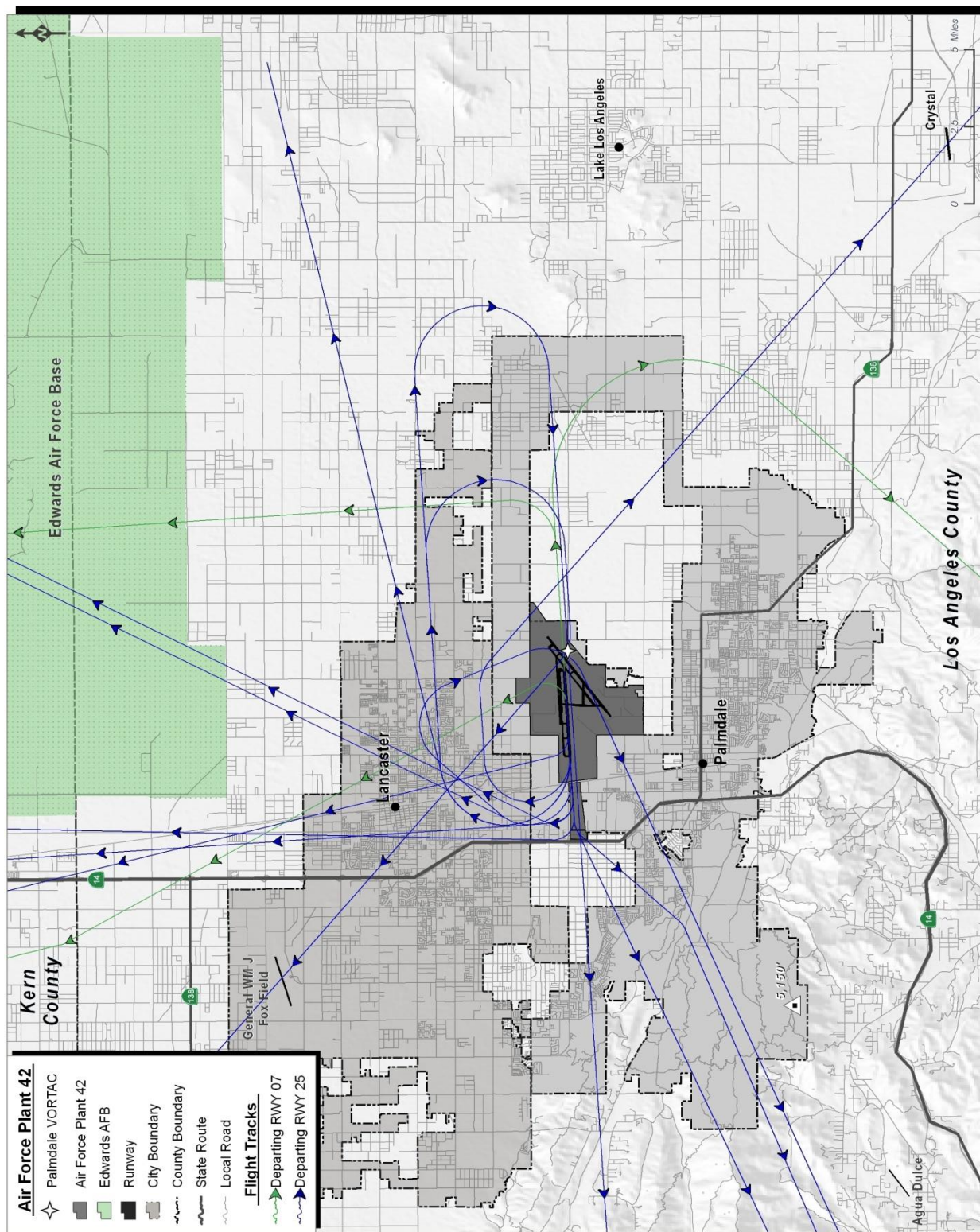
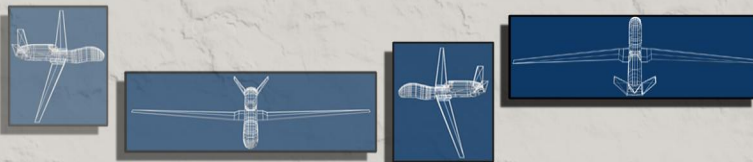
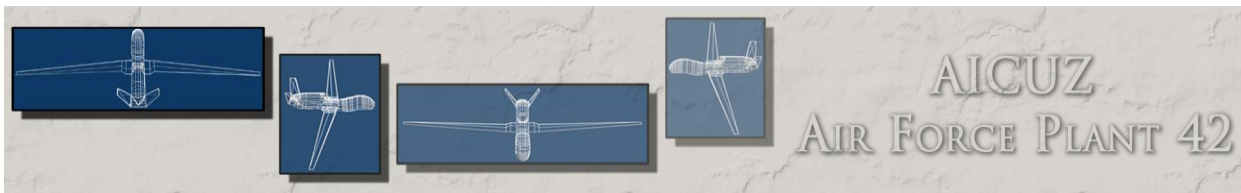


Figure 2-9. Plant 42 Summary of all Generalized Flight Tracks



2.6.4 Pre-Takeoff and Aircraft Maintenance Runup Operations

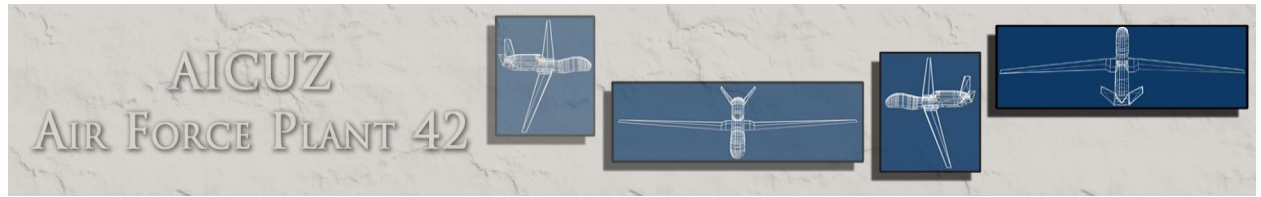
Pre-takeoff aircraft engine runs occur with every sortie. These runs usually occur in the parking space while the pre-flight checks are being performed and on taxiways at the ends of the runways while additional checks take place. Post-landing engine runs may also occur, again at the taxiways near the ends of the runway and in the parking space prior to shutdown at the end of a sortie. Additionally, engine maintenance run-ups occur in the parking area. If a runup with a higher power setting is required for testing or diagnostics, a location that is suitably designed for such purpose, such as a test stand, test cell, or hush house is used.

While the pre-takeoff and post-landing engine runs occur generally during the same timeframe as the sorties (i.e., day versus night), the maintenance runs have a greater night-time count than do flight operations. The maintenance personnel often use the period after the aircraft are finished flying for the day to perform required checks and maintenance so that aircraft are operational for the next day's flying activities.

2.6.5 Aircraft Flight Profiles and Noise Data

For the purposes of this AICUZ study, an aircraft flight profile denotes the engine power settings, altitudes above ground level, and aircraft airspeeds along a flight track. All Plant 42 aircraft flight profiles were obtained by interviewing pilots assigned to units based at Plant 42 that operate the aircraft. The data are then put into the NOISEMAP computer program and DNL contours are computed. NOISEMAP computes DNLs by either interpolating or extrapolating sound levels from a standard noise library to match the aircraft's configuration. The standard noise library is the result of controlled field measurements for each aircraft type.

Atmospheric temperature and relative humidity are important factors in the propagation of noise since they affect the ability of the atmosphere to absorb or attenuate noise. Plant 42's climate is characterized as arid with low humidity. There are approximately 186 clear days per year, and the remaining days being classified as cloudy to partly cloudy. The area receives only about 35 days of rain or snow each year.



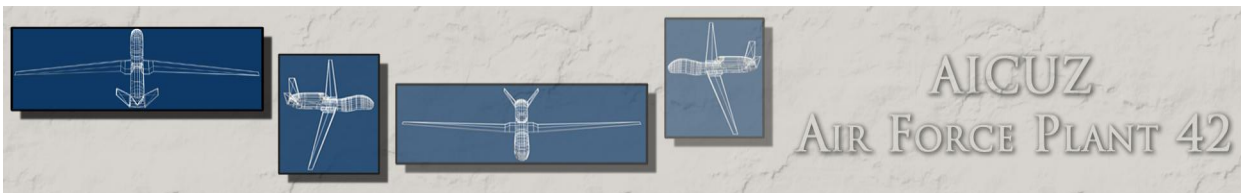
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AIR FORCE PLANT 42
CALIFORNIA

**CHAPTER 3 • LAND USE
COMPATIBILITY GUIDELINES**

AIR INSTALLATION COMPATIBLE USE ZONE



3.0 LAND USE COMPATIBILITY GUIDELINES

3.1 Introduction

The DoD has studied land-use compatibility in the vicinity of its airfields since the end of World War II. One of the first efforts was in 1952 when the President's Airport Commission published "The Airport and Its Neighbors", better known as the "Doolittle Report". The recommendations of this study were influential in the formulation of the APZ concept.

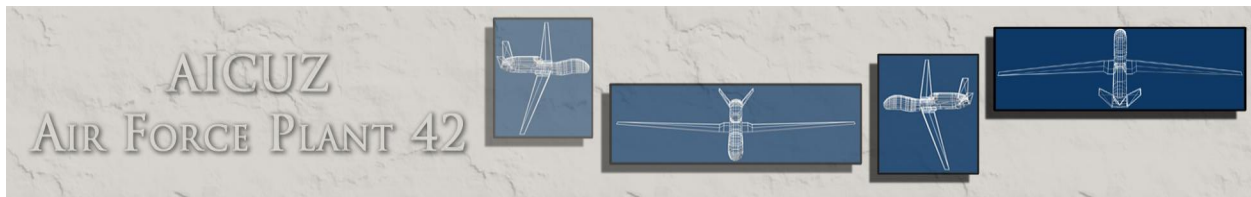
The AICUZ Program was developed in response to increased urban encroachment around military airfields. Most Air Force installations were built in the late 1940's and early 1950's in locations 10 to 15 miles away from urban population centers during an era of propeller aircraft. Since then, the nature of aircraft has changed, notably with the development of the jet engine. Urban growth has gradually moved closer towards the boundaries of many Air Force installations. Incompatible land use often results in public complaints about the effects of aircraft operations (e.g., noise and low overflights). Frequent complaints can cause operational changes, which in many cases adversely affect the flying mission. As an example, encroachment around Lowry, Chanute and Laredo AFBs contributed to the decision to cease aircraft operations at those installations.

The DoD developed the AICUZ Program to protect aircraft operational capabilities at its military airfields and to assist local government officials in protecting and promoting the public health, safety, and quality of life. The goal of the program is to promote compatible land use development around military airfields by providing information on aircraft noise levels and accident potential.

AICUZ reports describe three basic types of constraints that affect or result from flight operations. The first constraint involves areas identified by the FAA and DoD where height limitations on structures exist to prevent obstructions to air navigation. Airspace Control Surface Plans, which are based on Federal Aviation Regulations, designate height standards that determine whether an object constitutes an obstruction to air navigation.

The second constraint regarding flight operations involves the potential effects arising from noise exposure resulting from aircraft overflight and ground engine runs. Detailed sociological studies conducted by federal agencies over the past few decades have shown a correlation between certain noise exposure levels and increased levels of human annoyance. One of the purposes of the DoD AICUZ Program is a comparison of the land uses in the vicinity of its airfields to noise zones. Using the NOISEMAP computer program, which is similar to FAA's INM, the DoD produces noise contours showing the DNL that would be generated by current levels of aircraft operations. These contours (lines connecting points of equal noise exposure) are expressed in terms of the DNL. Essentially, the DNL metric is the average noise level over a 24-hour period with a 10 dB increase made for events occurring between 10 PM and 7 AM. In California, a 5 dB increase is added to aircraft flights that occur between 7 PM and 10 PM and a 10 dB increase is added to aircraft flights that occur between 10 PM and 7 AM to account for their increased annoyance. This AICUZ report contains noise contours plotted in increments of 5 dB, ranging from a DNL of 65 dB to 80+ dB. Additional information on the methodology used for analyses in this report is contained in Appendix C of Volume II.

The third constraint involves accident potential in areas near the runways based on statistical analyses of past DoD aircraft



accidents. DoD analyses have determined that the areas immediately beyond the ends of runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on these analyses, DoD developed three zones that have high relative potential for accidents. The CZ, or area closest to the runway's end, is the most hazardous area. The overall risk of an accident is so high that DoD generally acquires the land through purchase or easement to prevent development. APZ I is an area beyond the CZ that possesses a significant potential for accidents. APZ II is an area beyond APZ I having lesser, but still significant potential for accidents. While the aircraft accident potential in APZs I and II does not warrant land acquisition by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public. The CZs for the runways at Plant 42 are 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long, and APZ II is 3,000 feet wide by 7,000 feet long. Additional information on the methodology associated with accident potential is contained in Volume II, Appendix B of this report.

CZs and APZs are normally rectangular in shape, extending from the runway along the axis of its centerline but in certain circumstances a CZ and APZ can be curved.

3.2 Airspace Control Surfaces

Airspace Control Surfaces or "Imaginary Surfaces" are graphic representations resulting from the application of criteria for height and obstruction clearance found in the CFR, Title 14, Part 77 (14 CFR 77) and in Air Force design standards for its airfields. The design standards for Plant 42 are found in the DoD's Unified Facility Criteria (UFC) 3-260-01 *Airfield and Heliport Planning and Design* (Figure 3-1). Under the standards of the UFC, both runways at Plant 42 are Class B runways (designed and routinely used for fighter, heavy, jet aircraft as opposed to runways designed and routinely used by light, propeller aircraft). For a more complete description of obstruction evaluation/airport airspace analysis (OE/AAA), see FAR Part 77 and the UFC. Additional information on this topic is provided in Volume II, Appendix D.

In a 14 CFR 77 analysis, the heights of natural or man-made objects are examined to determine whether such objects would be hazardous to air navigation; this analysis is named after the section of the Federal Aviation Regulations (FAR Part 77) that set forth the applicable standards.

Another term often used in this line of inquiry is "imaginary surfaces." Imaginary surfaces project outward from an airfield, either parallel to the runway or inclined at an angle.

The purpose of these airspace control surfaces is to prevent construction of structures whose height would tend to compromise the ability of airplanes to land in adverse weather and, in the case of military airfields, to designate airspace required to safely conduct military training maneuvers. During periods of adverse weather conditions, course guidance is provided to pilots and

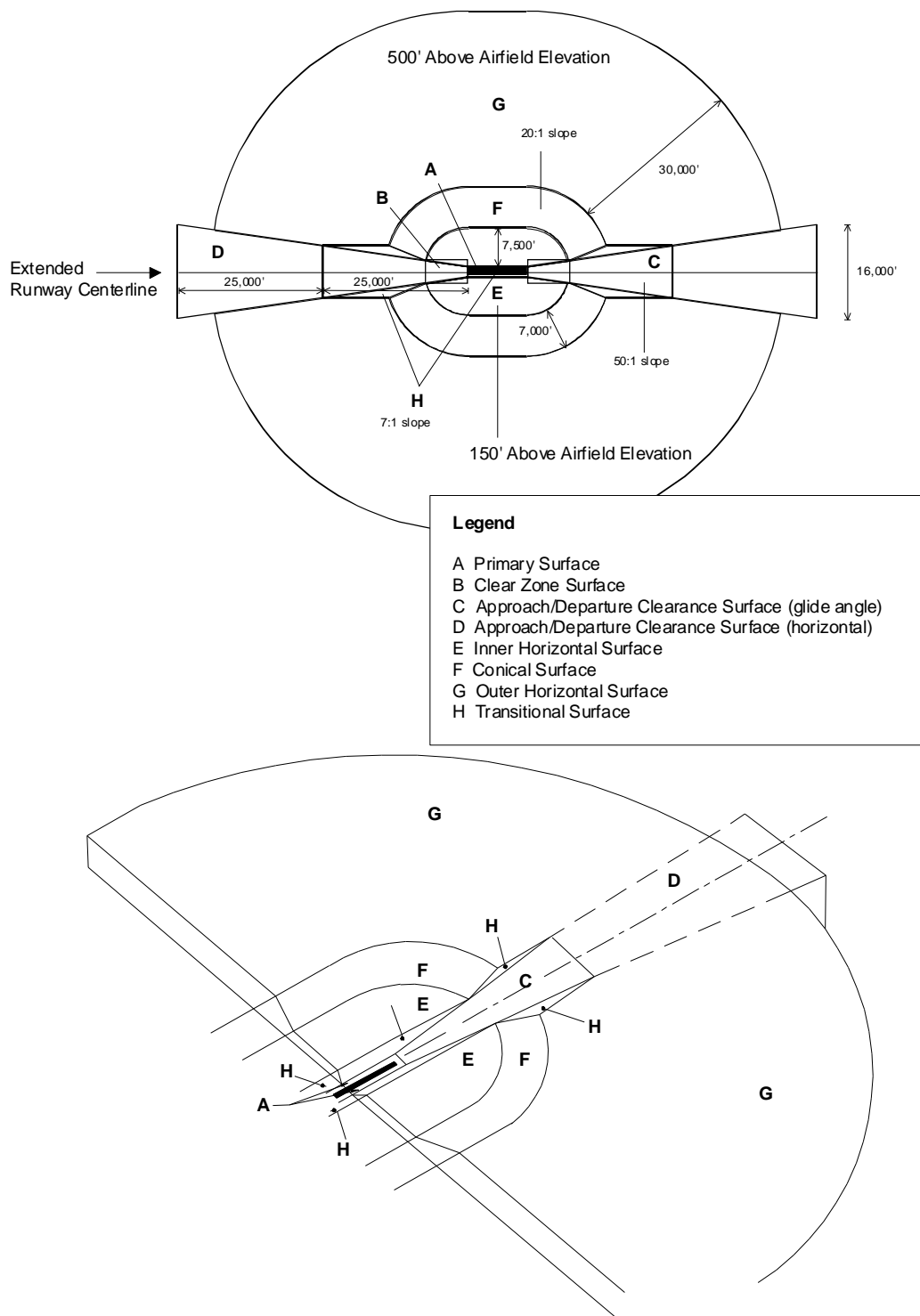
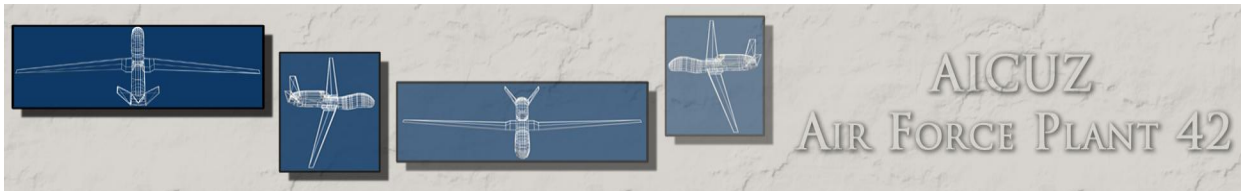
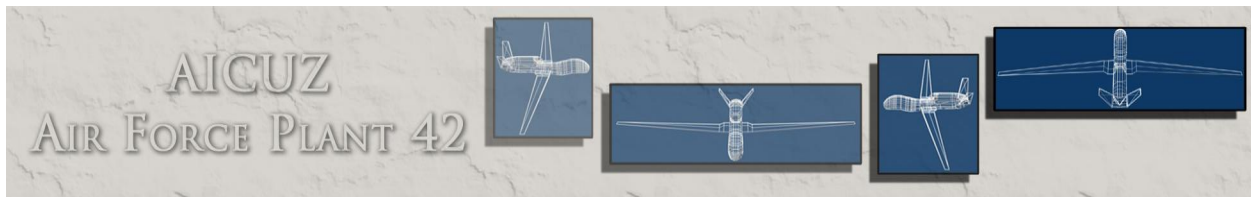


Figure 3-1. Plan View of 14 CFR 77 Imaginary Surfaces



minimum flight altitudes are observed to prevent collisions with terrain and man-made structures. If tall structures are built near airfields, the minimum in-flight altitude must also be increased.

The utility of an airfield is diminished when its minimum obstacle avoidance altitudes are increased, because the likelihood of having to divert to other airfields during adverse weather increases. A weather divert to another airfield consumes additional fuel and to allow for that possibility, training time is diminished. At Plant 42, increases to minimums in flight altitudes would diminish the viability of flight testing and proficiency training missions conducted by the aircraft manufacturers, the 412 FTW at Edwards, and the 146 AW at Channel Islands ANGB.

3.3 Land Uses Hazardous to Air Navigation

Controls discouraging land uses around an airfield that are inherently hazardous to aircraft or flight crews should be developed. The following uses should be restricted or prohibited in the vicinity of an airfield:

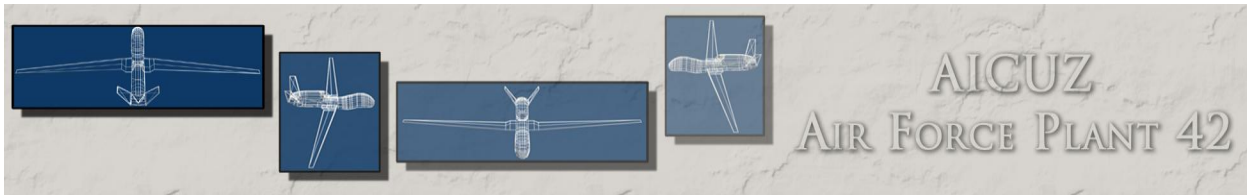
- Uses which release into the air any substance which would impair visibility or otherwise interfere with the operation of aircraft (i.e., steam, dust, or smoke from industrial operations);
- Uses which produce light emissions, either direct or indirect (reflective), which would interfere with pilot vision;
- Uses which produce electrical emissions which would interfere with aircraft communications systems or navigational equipment;
- Uses which would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, sand and gravel dredging operations, storm water retention ponds, created wetland areas, or the growing of certain vegetation; and
- Uses that provide for structures within ten feet of aircraft approach-departure and/or transitional surfaces outlined above.

3.4 Noise Due to Aircraft Operations

Using the NOISEMAP computer program, the Air Force produces DNL noise contours showing the areas with significant exposure to

While 14 CFR 77 Obstruction Evaluation/Airfield Airspace Analysis (OE/AAA) and Accident Potential use similar terminology, their methods and purposes are distinct.

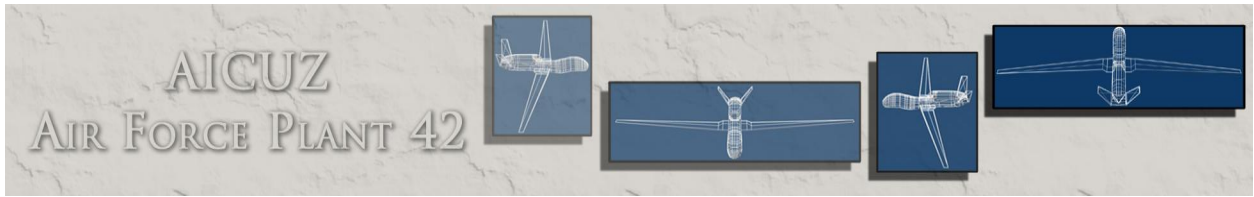
Accident Potential Areas are two-dimensional rectangles (CZ, APZ I, and APZ II) within which land use is assessed and restrictions are recommended. For example, within a Clear Zone, only items necessary for airfield operations (e.g., approach lights and navigation transmitters) are permitted and these must be designed to be frangible. With OE/AAA, the surfaces can be three-dimensional, and land use compatibility is not assessed. Instead, the height of the structure is examined to see if it interferes with arrivals and departures, particularly under instrument meteorological flight conditions.



aircraft noise. The DNL noise metric averages aircraft sound levels over a complete 24-hour period with the previously noted 10 dB increase added to those noise events taking place between 10 PM and 7 AM. This adjustment is made because most people are sleeping during these hours and generally winds diminish during this period, enabling the same sound energy to carry further than it would otherwise during the day. This AICUZ study contains the average busy-day noise contours plotted in increments of 5 dB(A), ranging from 65 dB(A) DNL to 80+ dB(A) DNL. An assessment of the compatibility of existing land uses, current zoning classifications, and future land use plans is made using the DNL contours.

Based on the aircraft operations data presented in Section 2.6.1, NOISEMAP (Version 7.352) was used to calculate and plot the contours for 65 dB(A) through 80+ dB(A) DNL for the anticipated aircraft operations. At the current operational tempo of 123 daily operations (33,105 annual operations) along the mix of flight tracks depicted in Chapter 2, the 65 dB(A) DNL contour extends west from the departure end of Runway 25 approximately 1.9 miles to the east the contour extends 2.0 miles from the arrival end of Runway 25. This reflects the usage pattern favoring westerly operations using Runway 25. To the sides of the Runway 7/25, the 65 dB(A) DNL contour extends approximately 1.1 miles and 1.7 miles to the north and south respectively. For the intersecting runway (4/22), the shape and extent of the contours are somewhat different and smaller. The 65 dB(A) DNL contour extends 1.4 miles southwest from the arrival end of Runway 4; to the northwest, the same contour extends only 0.15 miles from the arrival end of Runway 4. To the sides of Runway 4/22, the contour extends approximately 1.2 miles and 0.33 miles to the northwest and southeast, respectively (Figure 3-2).

In recognition of the adoption by the state of California of an alternative aircraft noise metric, CNEL, contours plotted in increments of 5 dB(A), ranging from 60 dB(A) to 80+ CNEL are also presented. The difference between DNL and CNEL is that the latter employs three time periods, rather than two. The nighttime period of 10 PM to 7 AM is the same and events occurring during this period have 10 dB(A) added to them just as they are with DNL. Where the two metrics differ is that CNEL has an evening period from 7 PM to 10 PM during which events occurring during this timeframe have 5 dB(A) added; under the DNL metric, this



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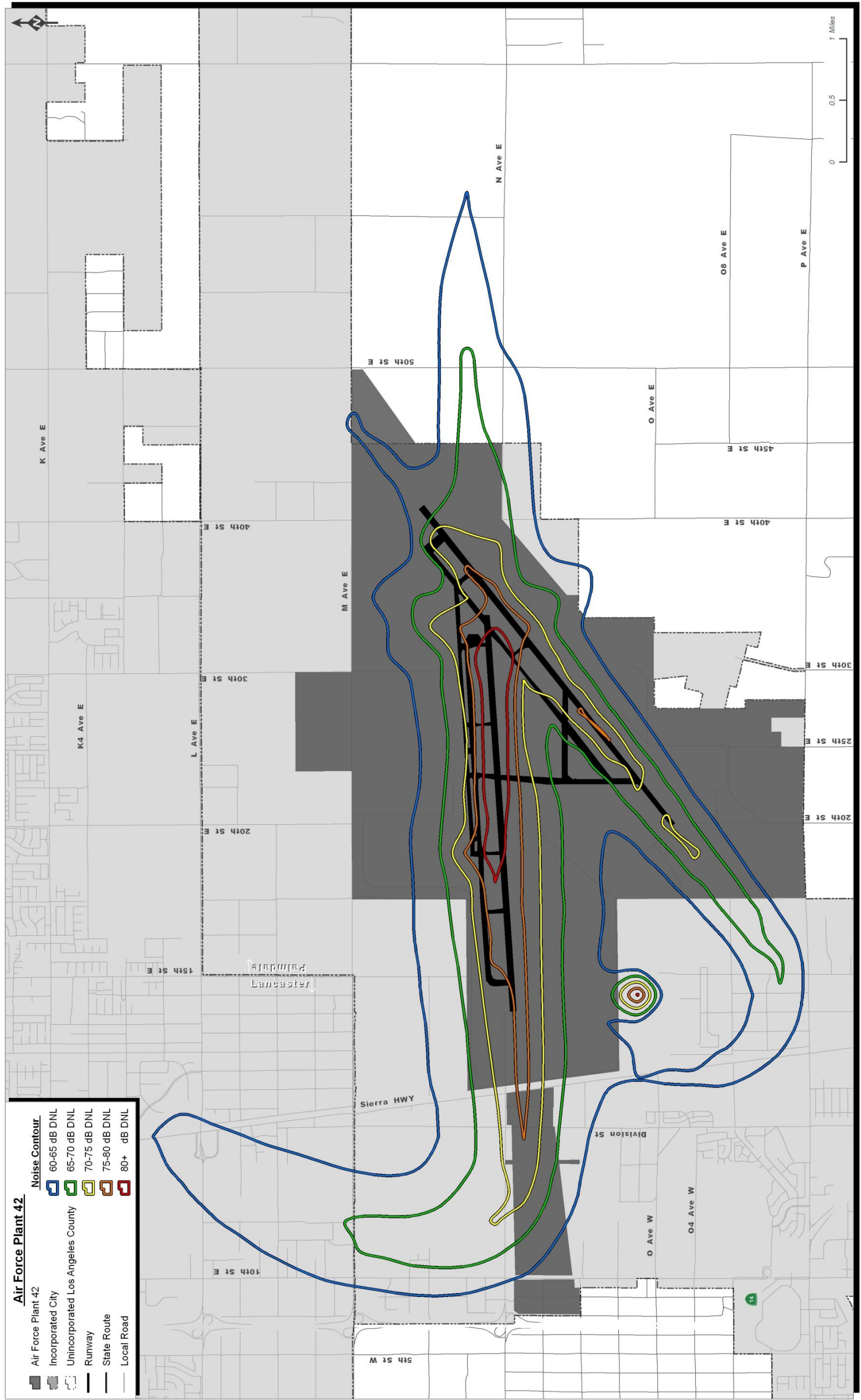
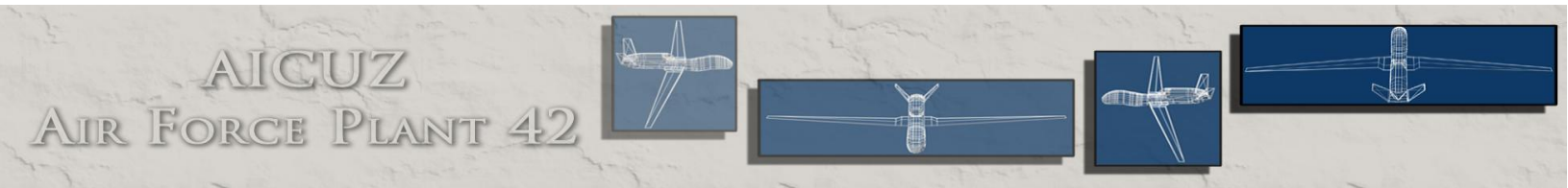
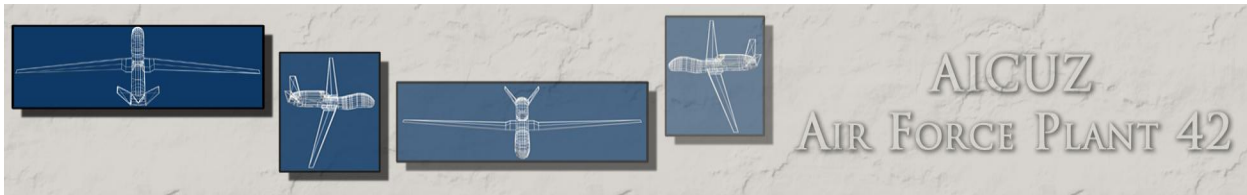


Figure 3-2. Air Force Plant 42 – 2010 Day-Night-Average Sound Levels (DNL)



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time period is considered to be part of the daytime and no adjustment to noise events would occur. It is important to note, however, that the DoD and Air Force make no land use recommendations below 65 dB(A) DNL nor do they rely upon CNEL in recommending compatible land uses. Calculating CNEL entails essentially the same steps as calculating DNL and therefore the results are presented in this report in a spirit of mutual respect and cooperation (Figure 3-3).

Using 2010 population data from the U.S. Census Bureau (USCB) combined with aerial photography, it is possible to estimate the number of persons occupying land that falls within a noise contour. The total area in each contour outside the base boundary and the number of residents within each contour were calculated for comparison purposes.

No persons are exposed to a DNL of 65 dB(A) or greater. The total land area underlying an area of noise exposure of 65 dB(A) DNL or greater is 2,897 acres, with 1,084 of those acres located off-base (Tables 3-1 and 3-2).

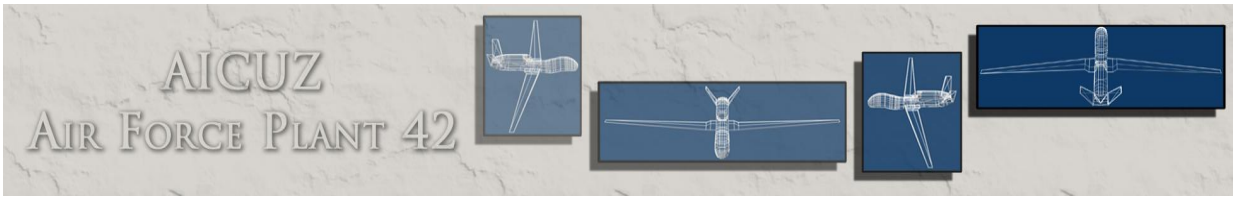
A comparison with the contour plots from the 2002 AICUZ study indicates that during the 10 year timeframe, the land area exposed to noise greater than 65 dB(A) DNL has decreased (Figure 3-4; Table 3-3). This is largely due to decreases in the number of flight operations occurring at Plant 42 and changes to the mix of aircraft produced, maintained or routinely operating from the facility. The flight tracks have not changed significantly during this time, although some minor changes in procedures have occurred.

3.5 Clear Zones (CZs) and Accident Potential Zones (APZs)

This section describes the accident potential criteria that are used to define the CZs and APZs and apply them to Plant 42. Section 3.4.1 presents the standards for defining CZs and APZs and Section 3.4.2 indicates how those standards apply to Plant 42.

3.5.1 Standards for CZs and APZs

Areas around military airfields are exposed to the possibility of aircraft accidents. While the maintenance of aircraft and the training of aircrews are rigorous, it should be understood that military flights at Plant 42 are primarily for the purposes of flight test and proficiency training. Despite stringent maintenance



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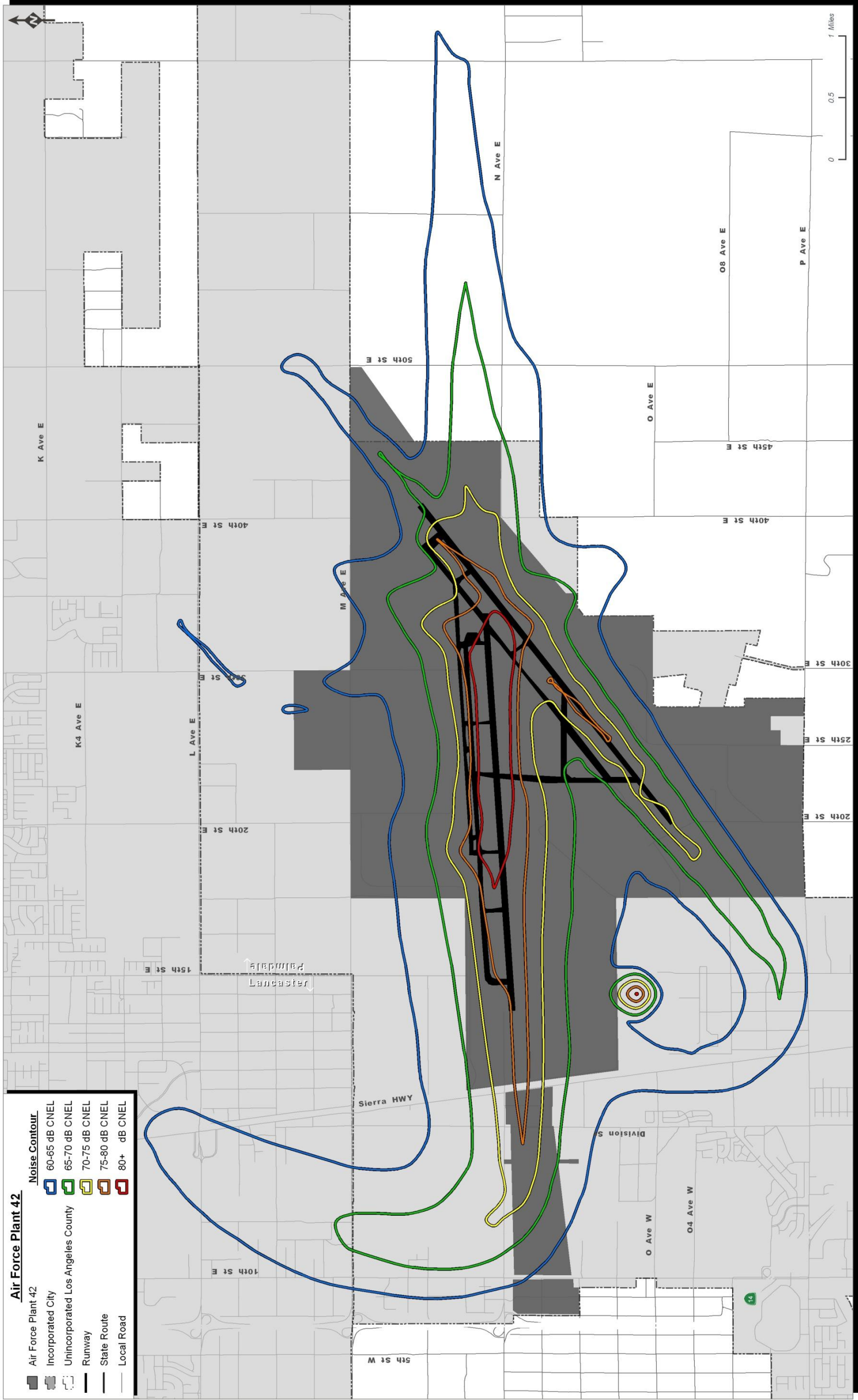
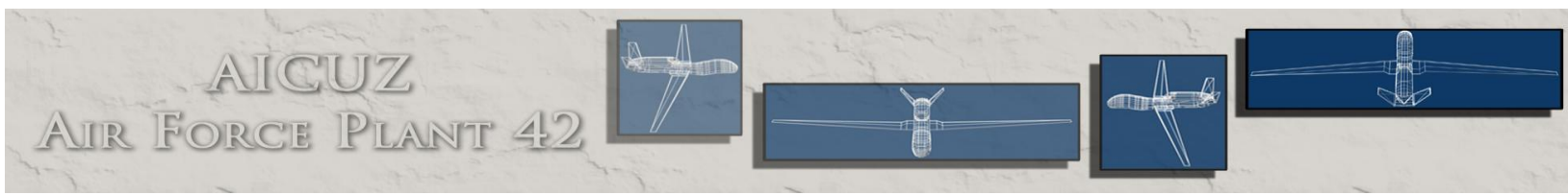


Figure 3-3. Air Force Plant 42 – Community Noise Equivalent Level (CNEL)



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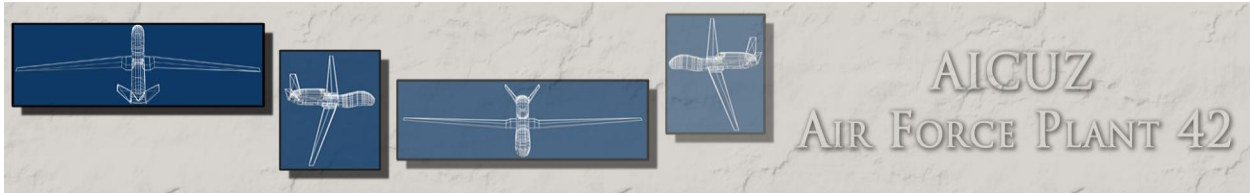


Table 3-1. Total Areas and Estimated Population (2010 Census) Residing within the 65 to 80+ dB Contours

| DNL Noise Zone | Acres | Population |
|----------------|----------------|------------|
| 65–69 | 1,574.6 | 0 |
| 70–74 | 791.8 | 0 |
| 75–79 | 364.4 | 0 |
| 80+ | 166.5 | 0 |
| TOTAL | 2,897.3 | 0 |

Source: US Census Bureau (2010)

Table 3-2. Off-Base Areas and Populations within the 65 to 80+ dB Noise Contours

| DNL Noise Zone | Acres | Population |
|----------------|--------------|------------|
| 65–69 | 583.6 | 0 |
| 70–74 | 129.4 | 0 |
| 75–79 | 13.7 | 0 |
| 80+ | * | 0 |
| TOTAL | 726.7 | 0 |

*Acreage within 80+ contour is negligible, 0.03 acre
 Source: US Census Bureau (2010)

AICUZ AIR FORCE PLANT 42

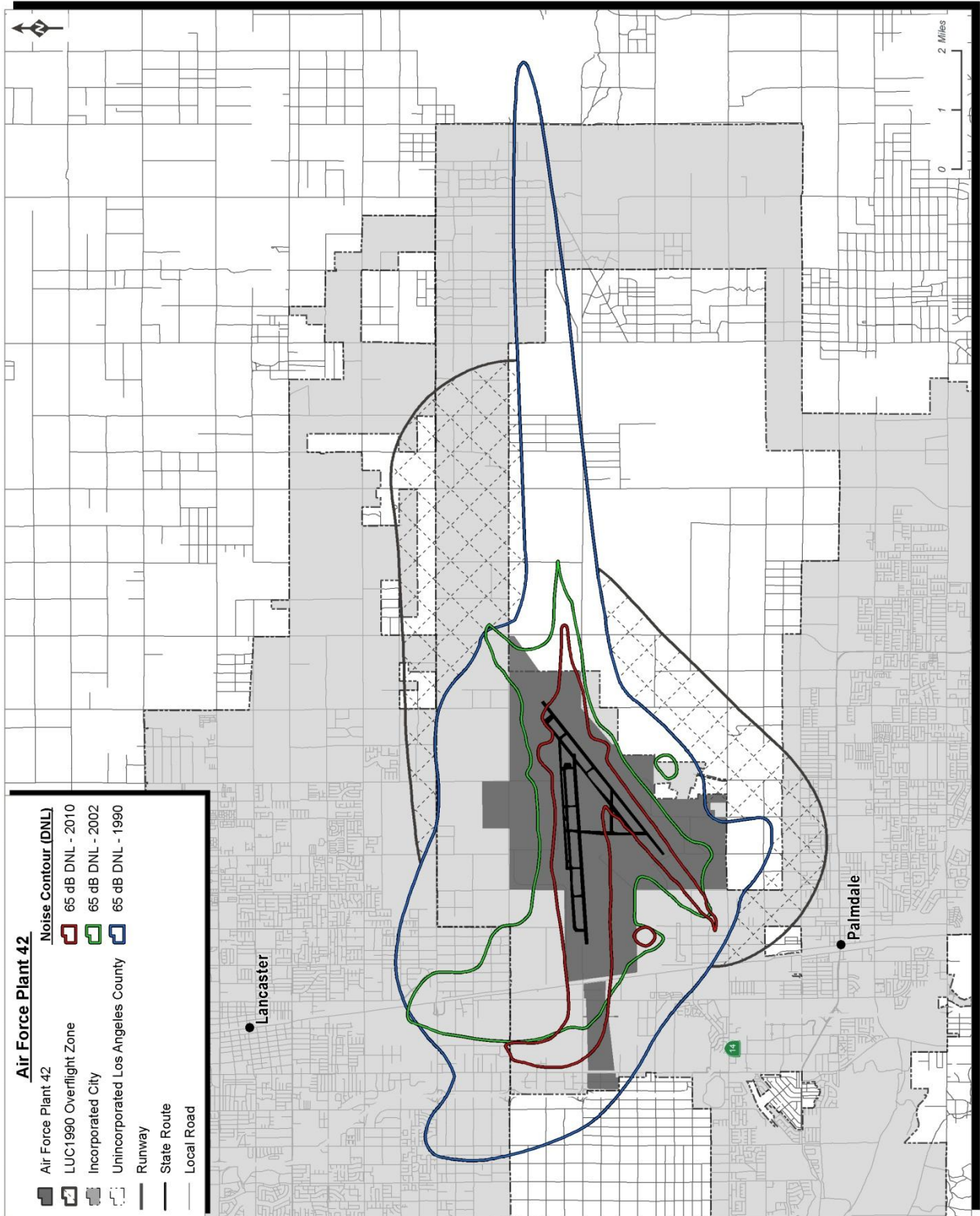
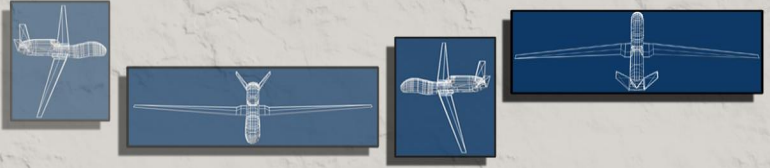


Figure 3-4. Day-Night Average Sound Level in 1990, 2002, and 2010

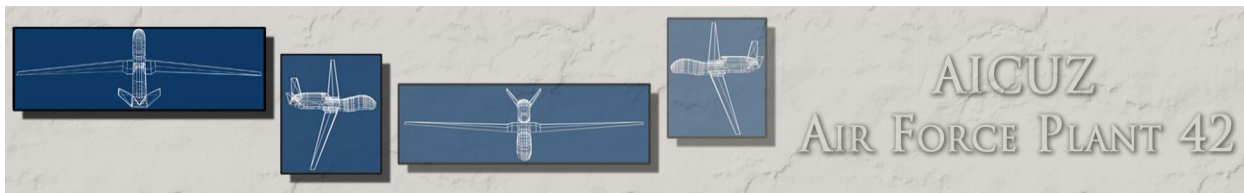


Table 3-3. Comparison of Acres within the 1990, 2002, and 2010 Noise Zones

| DNL Noise Zone | 1990 | 2002 | 2010 |
|---------------------------|---------------|---------------|--------------|
| 65–69 | 9,406 | 8,513 | 1,575 |
| 70–74 | 5,377 | 1,468 | 792 |
| 75–79 | 2,914 | 926 | 364 |
| 80+ | 2,112 | 600 | 167 |
| TOTAL | 19,809 | 11,507 | 2,898 |

requirements and countless hours of training, history shows that accidents occur. Accidents of military aircraft differ from accidents of commercial air carriers and general aviation due to the variety of aircraft flown, the type of missions, and the number of training flights.

Although the risk to people on the ground being killed or injured by aircraft accidents is small, an aircraft accident is a high-consequence event. When a crash occurs, the result is often catastrophic. As a result, the Air Force does not attempt to base its safety standards on accident probabilities, but instead approaches this safety issue from a land-use planning perspective. Designation of safety zones around airfields and restrictions of incompatible land uses can reduce the public’s exposure to aircraft safety hazards.

Based on analysis of 834 Air Force accidents at Air Force bases from 1968 through 1995 that occurred within 10 miles of the associated base, three planning zones were established; the CZ, APZ I, and APZ II (Figure 3-5). Each end of a runway has a CZ that starts at the runway threshold and extends outward 3,000 feet with a width of 3,000 feet. Of the three safety zones, the CZ has the highest potential for accidents with 27 percent of the total accidents studied having occurred in this zone. The Air Force has adopted a policy of acquiring property rights through purchase or easement to areas designated as CZs.

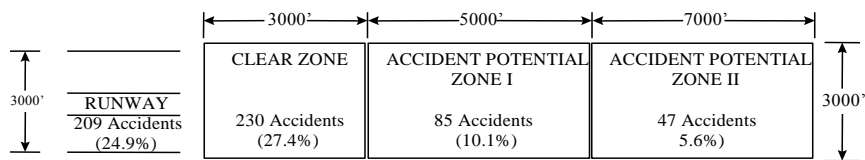
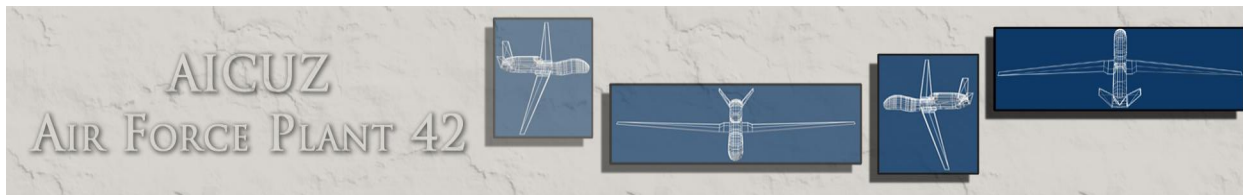


Figure 3-5. Air Force Aircraft Accident Data (838 Accidents - 1968-1995)

APZ I extends outward from the CZ an additional 5,000 feet. This area has a significant though reduced accident potential. Ten percent of the accidents studied occurred in this area. APZ I is 3,000 feet wide and 5,000 feet long beginning 3,000 feet from the runway endpoint along and centered on the extended runway centerline.

APZ II extends from the outer end of APZ I an additional 7,000 feet. This is an area having a lesser, but still significant potential for accidents. Five percent of the accidents studied occurred in this area. APZ II is 3,000 feet wide and 7,000 feet long beginning 8,000 feet from the runway endpoint along and centered on the extended runway centerline.

While the aircraft accident potential in APZs I and II does not warrant land acquisition by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public. Of the Air Force accidents studied, 15 percent occurred in APZs I and II. The area extending 1,000 feet out from each side of the runway centerline for the length of the runway accounted for 25 percent of the accidents analyzed. The remaining 33 percent occurred outside APZ II but were dispersed within 10 miles of the associated airfield.

3.5.2 CZs and APZs at Plant 42

The Plant 42 CZs and APZs are based on the configuration of the runways (Figure 3-6). Just as population estimates and areas were derived within noise contours, population (based on 2010 census data) and areas associated with CZs and APZs can be estimated. It is estimated that no persons reside within the CZs for either Runway 04/22 or for Runway 07/25; it is estimated that 564 persons reside within the APZs associated with Runway 04/22 and 268 persons for Runway 07/25 (Table 3-4).

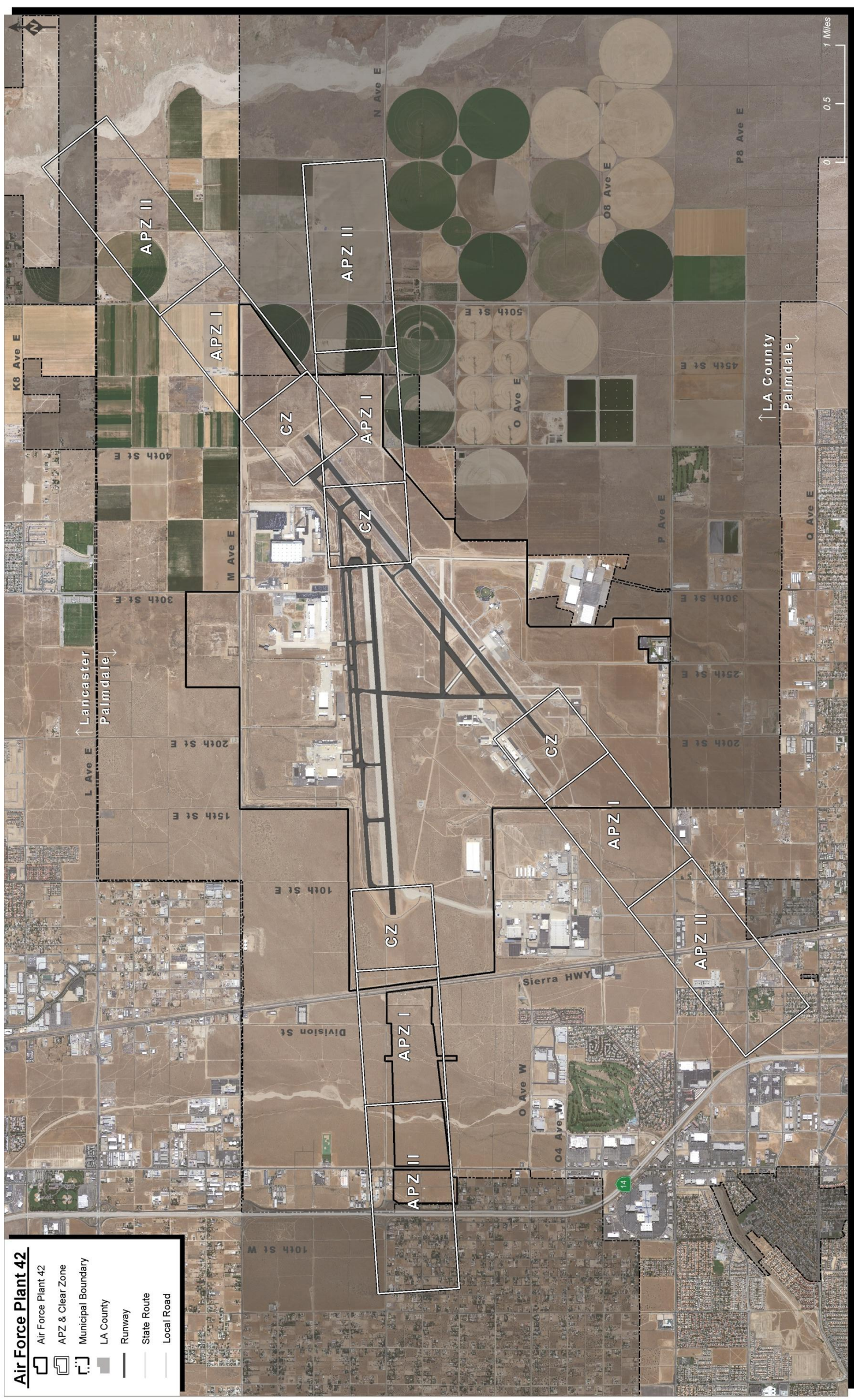
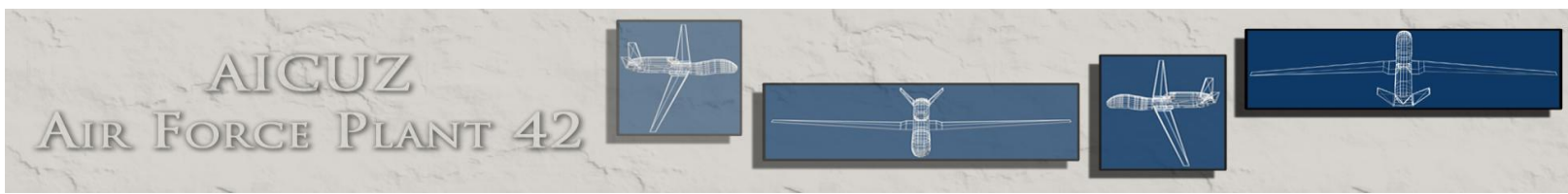


Figure 3-6. Plant 42 CZs and APZs



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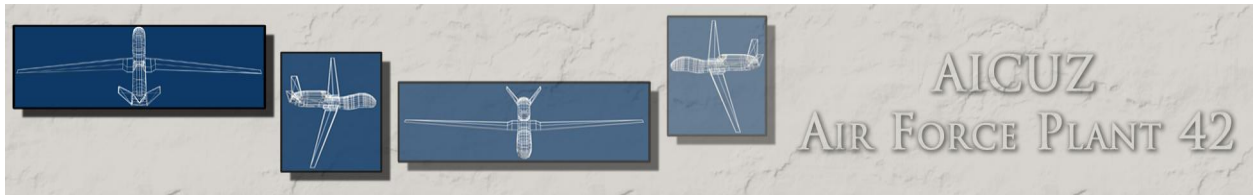


Table 3-4. Total Acreage and population within the Plant 42 Runways 04/22 and 07/25 CZs and APZs

| Zone | Acres | Off-Base Acres | Population |
|--------------|----------------|---------------------------|-------------------|
| Clear Zone | 826.4 | 0.4* | 0 |
| Zone I | 1,377.4 | 708.6 | 8 |
| Zone II | 1,928.4 | 1,760.5 | 824 |
| Total | 4,132.2 | 2,469.5 | 832 |

*0.4 acres of the Clear Zone is owned by LAWA
 Source: US Census Bureau (2010)

3.6 Land Use Compatibility

Each AICUZ report contains land use guidelines. Combinations of noise exposure and accident potential at Plant 42 have been considered in relation to land uses, with an ultimate determination of their compatibility (Table 3-5). Noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, Guidelines for Considering Noise in Land Use Planning and Control. The DoT publication, Standard Land Use Coding Manual (SLUCM), has been used for identifying and coding land use activities.

3.7 Participation in the Planning Process

As local communities prepare their land use plans, the Air Force must be ready to provide data and information. Aeronautical Systems Center (ASC)/Detachment 1 has been designated as the official liaison with the local community on all planning matters. This officer is prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by, Plant 42.

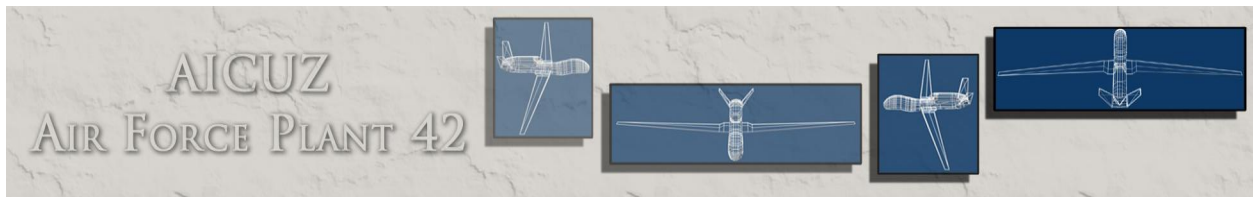


Table 3-5. Land Use Compatibility, Noise Exposure, and Accident Potential

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|-----------|--|--------------------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 10 | Residential | | | | | | | |
| 11 | Household units | | | | | | | |
| 11.11 | Single units; detached | N | N | Y ¹ | A ¹¹ | B ¹¹ | N | N |
| 11.12 | Single units; semidetached | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 11.13 | Single units; attached row | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 11.21 | Two units; side-by-side | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 11.22 | Two units; one above the other | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 11.31 | Apartments; walk up | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 11.32 | Apartments; elevator | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 12 | Group quarters | N | N | N | A ¹¹ | B ¹¹ | N | N |
| 13 | Residential hotels | N | N | N | A ¹¹ | B ¹¹ | | N |
| 14 | Mobile home parks or courts | N | N | N | N | N | N | N |
| 15 | Transient lodgings | N | N | N | A ¹¹ | B ¹¹ | C ¹¹ | N |
| 16 | Other residential | N | N | N ¹ | A ¹¹ | B ¹¹ | N | N |
| 20 | Manufacturing | | | | | | | |
| 21 | Food & kindred products; manufacturing | N | N ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 22 | Textile mill products; manufacturing | N | N ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 23 | Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing | N | N | N ² | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 24 | Lumber and wood products (except furniture); manufacturing | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 25 | Furniture and fixtures; manufacturing | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 26 | Paper & allied products; manufacturing | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 27 | Printing, publishing, and allied industries | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 28 | Chemicals and allied products; manufacturing | N | N | N ² | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 29 | Petroleum refining and related industries | N | N | N | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 30 | Manufacturing | | | | | | | |
| 31 | Rubber and misc. plastic products, manufacturing | N | N ² | N ² | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 32 | Stone, clay and glass products manufacturing | N | N ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 33 | Primary metal industries | N | N ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |

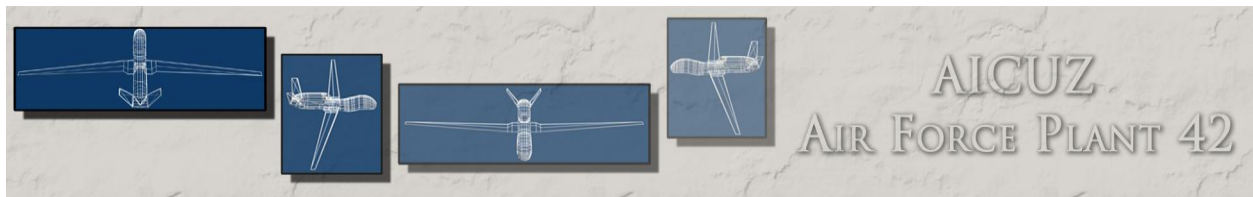


Table 3-5. Land Use Compatibility, Noise Exposure, and Accident Potential (cont'd)

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|-----------|---|--------------------------|----------------|----------------|-------------|-----------------|-----------------|-----------------|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 34 | Fabricated metal products; manufacturing | N | N ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 35 | Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks manufacturing | N | N | N ² | Y | A | B | N |
| 39 | Miscellaneous manufacturing | N | Y ² | Y ² | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 40 | Transportation, communications and utilities | | | | | | | |
| 41 | Railroad, rapid rail transit and street railroad transportation | N ³ | Y ⁴ | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 42 | Motor vehicle transportation | N ³ | Y | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 43 | Aircraft transportation | N ³ | Y ⁴ | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 44 | Marine craft transportation | N ³ | Y ⁴ | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 45 | Highway & street right-of-way | N ³ | Y | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 46 | Automobile parking | N ³ | Y ⁴ | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 47 | Communications | N ³ | Y ⁴ | Y | Y | A ¹⁵ | B ¹⁵ | N |
| 48 | Utilities | N ³ | Y ⁴ | Y | Y | Y | Y ¹² | Y ¹³ |
| 49 | Other transportation communications and utilities | N ³ | Y ⁴ | Y | Y | A ¹⁵ | B ¹⁵ | N |
| 50 | Trade | | | | | | | |
| 51 | Wholesale trade | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 52 | Retail trade-building materials, hardware and farm equipment | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 53 | Retail trade-general merchandise | N ² | N ² | Y ² | Y | A | B | N |
| 54 | Retail trade-food | N ² | N ² | Y ² | Y | A | B | N |
| 55 | Retail trade-automotive, marine craft, aircraft and accessories | N ² | N ² | Y ² | Y | A | B | N |
| 56 | Retail trade-apparel and accessories | N ² | N ² | Y ² | Y | A | B | N |
| 57 | Retail trade-furniture, home furnishings and equipment | N ² | N ² | Y ² | Y | A | B | N |
| 58 | Retail trade-eating and drinking establishments | N | N | N ² | Y | A | B | N |
| 59 | Other retail trade | N | N ² | Y ² | Y | A | B | N |
| 60 | Services | | | | | | | |
| 61 | Finance, insurance and real estate services | N | N | Y ⁶ | Y | A | B | N |
| 62 | Personal services | N | N | Y ⁶ | Y | A | B | N |

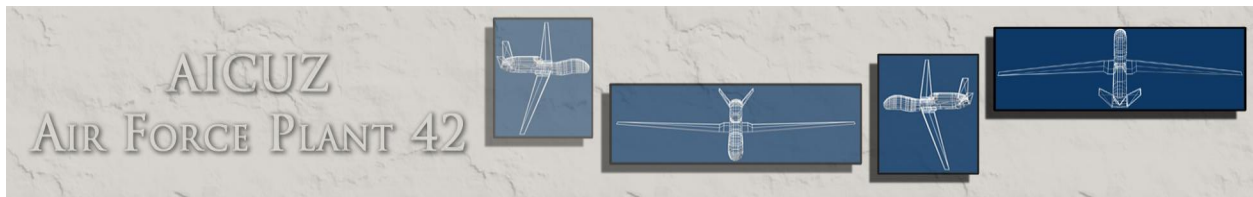


Table 3-5. Land Use Compatibility, Noise Exposure, and Accident Potential (cont'd)

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|--------------|--|--------------------------|-----------------------|----------------|-----------------|-----------------|-----------------|---------------------|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 62.4 | Cemeteries | N | Y ⁷ | Y ⁷ | Y | Y ¹² | Y ¹³ | Y ^{14, 21} |
| 63 | Business services | N | Y ⁸ | Y ⁸ | Y | A | B | N |
| 64 | Repair services | N | Y ² | Y | Y | Y ¹² | Y ¹³ | Y ¹⁴ |
| 65 | Professional services | N | N | Y ⁶ | Y | A | B | N |
| 65.1 | Hospitals, nursing homes | N | N | N | A* | B* | N | N |
| 65.1 | Other medical facilities | N | N | N | Y | A | B | N |
| 66 | Contract construction services | N | Y ⁶ | Y | Y | A | B | N |
| 67 | Governmental services | N ⁶ | N | Y ⁶ | Y* | A* | B* | N |
| 68 | Educational services | N | N | N | A* | B* | N | N |
| 69 | Miscellaneous services | N | N ² | Y ² | Y | A | B | N |
| 70 | Cultural, entertainment and recreational | | | | | | | |
| 71 | Cultural activities (including churches) | N | N | N ² | A* | B* | N | N |
| 71.2 | Nature exhibits | N | Y ² | Y | Y* | N | N | N |
| 72 | Public assembly | N | N | N | Y | N | N | N |
| 72.1 | Auditoriums, concert halls | N | N | N | A | B | N | N |
| 72.11 | Outdoor music shell, amphitheaters | N | N | N | N | N | N | N |
| 72.2 | Outdoor sports arenas, spectator sports | N | N | N | Y ¹⁷ | Y ¹⁷ | N | N |
| 73 | Amusements | N | N | Y ⁸ | Y | Y | N | N |
| 74 | Recreational activities (including golf courses, riding stables, water recreation) | N | Y ^{8, 9, 10} | Y | Y* | A* | B* | N |
| 75 | Resorts and group camps | N | N | N | Y* | Y* | N | N |
| 76 | Parks | N | Y ⁸ | Y ⁸ | Y* | Y* | N | N |
| 79 | Other cultural, entertainment and recreation | N ⁹ | Y ⁹ | Y ⁹ | Y* | Y* | N | N |
| 80 | Resources production and extraction | | | | | | | |
| 81 | Agriculture (except livestock) | Y ¹⁶ | Y | Y | Y ¹⁸ | Y ¹⁹ | Y ²⁰ | Y ^{20, 21} |
| 81.5 to 81.7 | Livestock farming and animal breeding | N | Y | Y | Y ¹⁸ | Y ¹⁹ | Y ²⁰ | Y ^{20, 21} |
| 82 | Agricultural related activities | N | Y ⁵ | Y | Y ¹⁸ | Y ¹⁹ | N | N |
| 83 | Forestry activities and related services | N ⁵ | Y | Y | Y ¹⁸ | Y ¹⁹ | Y ²⁰ | Y ^{20, 21} |
| 84 | Fishing activities and related services | N ⁵ | Y ⁵ | Y | Y | Y | Y | Y |

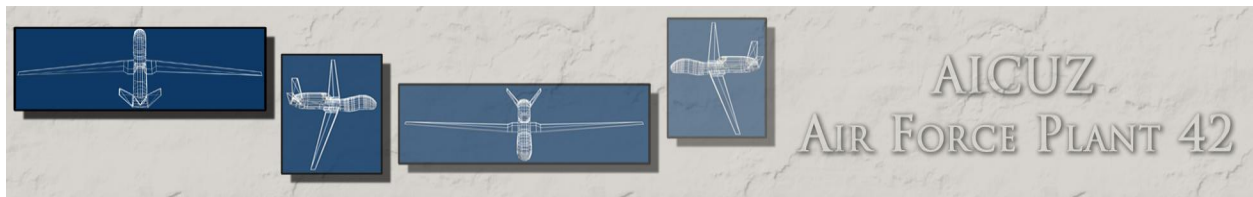


Table 3-5. Land Use Compatibility, Noise Exposure, and Accident Potential (cont'd)

| LAND USE | | ACCIDENT POTENTIAL ZONES | | | NOISE ZONES | | | |
|-----------|---|--------------------------|----------------|--------|-------------|----------|----------|--------|
| SLUCM NO. | NAME | CLEAR ZONE | APZ I | APZ II | 65-69 dB | 70-74 dB | 75-79 dB | 80+ dB |
| 85 | Mining activities and related services | N | Y ⁵ | Y | Y | Y | Y | Y |
| 89 | Other resources production and extraction | N | Y ⁵ | Y | Y | Y | Y | Y |

LEGEND SLUCM - Standard Land Use Coding Manual, U.S. Department of Transportation.

Y = (Yes); Land use and related structures are compatible without restriction.

N = (No); Land use and related structures are not compatible and should be prohibited.

Y^x = (Yes with restrictions); Land use and related structures are generally compatible; see note indicated by the superscript.

N^x = (No with exceptions); See note indicated by the superscript.

NLR = (Noise Level Reduction; NLR) (outdoor to indoor); To be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C = Land use and related structures generally compatible; measures to achieve NLR of A (25 dB), B (30 dB), or C (35 dB) should be incorporated into the design and construction of structures.

A*, B*, and C* = Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

* = The designation of these uses as "compatible" in this zone reflects individual federal agency and program consideration of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

¹Suggested maximum density of 1-2 dwelling units per acre possibly increased under a Planned Unit Development (PUD) where maximum lot coverage is less than 20 percent.

²Within each land use category, uses exist where further definition may be needed due to the variation of densities in people and structures.

Shopping malls and shopping centers are considered incompatible in any APZ.

³The placing of structures, buildings, or above ground utility lines in the clear zone is subject to severe restrictions. In a majority of the clear zones, these items are prohibited. See AFI 32-7063 and AFI 32-1026 for specific guidance.

⁴No passenger terminals and no major above ground transmission lines in APZ I.

⁵Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.

⁶Low-intensity office uses only. Meeting places, auditoriums, etc., are not recommended.

⁷Excludes chapels.

⁸Facilities must be low intensity.

⁹Clubhouse not recommended.

¹⁰Areas for gatherings of people are not recommended.

^{11a}Although local conditions may require residential use, it is discouraged in DNL 65-69 dB and strongly discouraged in DNL 70-74 dB. An evaluation should be conducted prior to approvals, indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones, and that there are no viable alternative locations.

^{11b}Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL 65-69 dB and DNL 70-74 dB should be incorporated into building codes and considered in individual approvals.

^{11c}NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.

¹²Measures to achieve the same NLR as required for facilities in the DNL 65-69 dB range 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.

¹³Measures to achieve the same NLR as required for facilities in the DNL 70-74 dB range 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.

¹⁴Measures to achieve the same NLR as required for facilities in the DNL 75-79 dB range 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.

¹⁵If noise sensitive, use indicated NLR; if not, the use is compatible.

¹⁶No buildings.

¹⁷Land use is compatible provided special sound reinforcement systems are installed.

¹⁸Residential buildings require the same NLR required for facilities in the DNL 65-69 dB range.

¹⁹Residential buildings require the same NLR required for facilities in the DNL 70-74 dB range.

²⁰Residential buildings are not permitted.

²¹Land use is not recommended. If the community decides the use is necessary, hearing protection devices should be worn by personnel.

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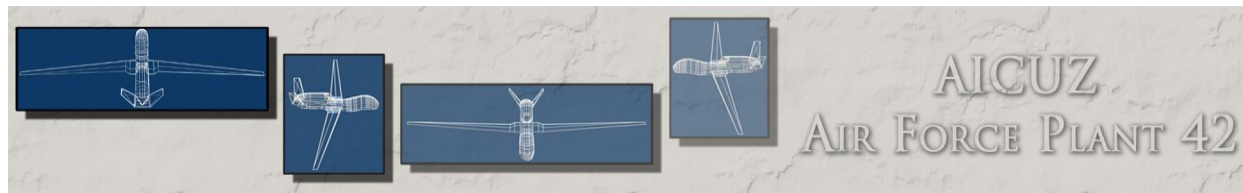
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AIR FORCE PLANT 42
CALIFORNIA

**CHAPTER 4 • LAND USE
AND ANALYSIS**

AIR INSTALLATION COMPATIBLE USE ZONE



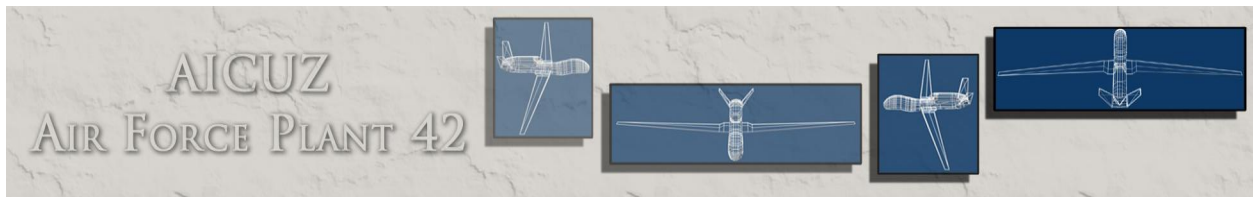
4.0 LAND USE AND ANALYSIS

4.1 Introduction

Land use planning and control is a dynamic rather than a static process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concerns. The planning process accommodates this fluidity in that decisions are normally not based on boundary lines but rather on more generalized area designations. Advances in computer technology has enabled Plant 42 to more precisely display its flight tracks, airspace control surfaces, noise contours, and accident potential areas for land use planning purposes.

In California, land use planning and zoning is delegated to city councils and county boards of supervisors. Land use planning and zoning is exercised both by incorporated cities and by counties for those lands outside of incorporated areas. Additionally, cities, counties, and special purpose jurisdictions (e.g., water authorities) control of land development through subdivision regulation and provision of public utilities such as public water and sewerage utilities as well as through the issuance of driveway permits that allow access to public roads. Land use planning is undertaken to facilitate and accommodate development in a more orderly and cost efficient fashion than would occur otherwise. Because development at significant densities does not occur without requiring investment in substantial public services (utilities, schools, public safety, libraries, parks and recreational facilities), states and municipalities undertake planning studies and develop a regulatory framework to guide future growth. The primary methods for implementing those plans are public investment (construction of roads, utilities), land use control (subdivision and zoning regulations), and design standards (landscaping and historic preservation ordinances). Over time, land use changes are the result of changing demographics and population trends that are channeled and focused into specific areas as a result of land use planning efforts and regulations.

Each of the three jurisdictions in the immediate vicinity of Plant 42 (the cities of Palmdale and Lancaster and Los Angeles County), has adopted a Comprehensive Master Planning document (including generalized recommendations for land use at specific locations) as well as implementing ordinances to further the



objectives of those plans, such as a zoning ordinance and subdivision controls. Under state law, a city or county has the power to regulate land use in California to the extent that the legislature has generally granted cities such powers. In unincorporated areas, land use control is usually exercised by a county; however, cities have some limited extra-territorial planning powers in areas near their boundaries. A set of building standards adopted by the State governs construction standards in California; however, it is implemented at the local level by the city or county code officials. In certain circumstances upon a finding made by a local government that particular climactic, topographic, or geological circumstances warrant it, more stringent standards may be adopted.

Additionally, the State Aeronautics Act (California Public Utilities Code §21001 et seq.) sets forth a comprehensive planning scheme for assuring land use compatibility with respect to civil and military airfields statewide. Since 1967, state law has required establishment of an Airport Land Use Commission (ALUC) in any county having a civil public use or military airfield—in Los Angeles County, the Regional Planning Commission serves as the ALUC—and prescribes several duties for them. Among the duties of an ALUC is preparation and adoption of an airport land use compatibility plan. Further, state law requires ALUCs and local planning jurisdictions to coordinate their planning efforts and for ALUC's to review plans adopted by municipalities and counties.

Other state laws require a disclosure addendum to all real estate contracts involving the transfer of residential property. Failure of a seller to provide a disclosure prior to contract ratification gives buyers the right to terminate contracts unless the property in question is located outside of an airport influence area defined by the ALUC. A similar disclosure requirement applies to residential lease contracts.

Population growth is a primary influence on land use planning efforts. The population of the State of California in general and the Palmdale/Lancaster region is growing rapidly (Table 4-1). When Plant 42 was established in 1953, it was a relatively undeveloped area in Los Angeles County. Originally considered somewhat distant and removed from developed area, the suburban growth experienced by the region has resulted over time in population growth and land use changes in the vicinity of the base.

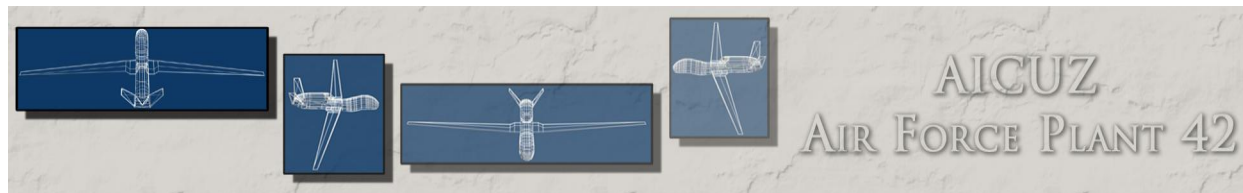


Table 4-1. US Census Population

| Jurisdiction | 2000 | 2010 | Population Change |
|---------------------|----------------|----------------|--------------------------|
| State of California | 33,871,648 | 37,253,956 | +10% |
| Los Angeles County | 9,519,338 | 9,818,605 | +3% |
| City of Palmdale | 116,573 | 152,750 | +31% |
| City of Lancaster | 118,783 | 156,633 | +32% |
| Kern County | 661,645 | 839,631 | +27% |

Source: US Census Bureau (2000, 2010)

The City of Palmdale now surrounds Plant 42 and portions of the City Lancaster lie approximately one-half mile to the west and one mile to the north of the facility.

Since the release of the 2002 AICUZ study, suburban growth has continued to radiate outward from Palmdale and Lancaster and land uses are changing from agricultural or open space to commercial or residential land use. Like many other regions, existing or recommended land uses are a function of transportation corridors, extension of utilities (particularly water and sewerage), terrain and topography, climate (air and water flows), employment patterns, presence of trade and service centers, and demographic trends (Figure 4-1). The existing land use data is compiled by the Los Angeles County Assessor’s Office at the parcel level.

For the purposes of this study, the wide variety of existing and future land uses have been classified into one of the following six general categories as shown in Figure 4-2:

- (1) Residential—includes all types of residential activity, such as single and multi-family residences and mobile homes, at a density of greater than one dwelling unit per acre.
- (2) Commercial—encompasses offices, retail, restaurants, and other types of commercial establishments.
- (3) Industrial—includes manufacturing, warehousing, and other similar uses.
- (4) Public/Quasi-Public—is comprised of publicly owned lands and/or lands to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.

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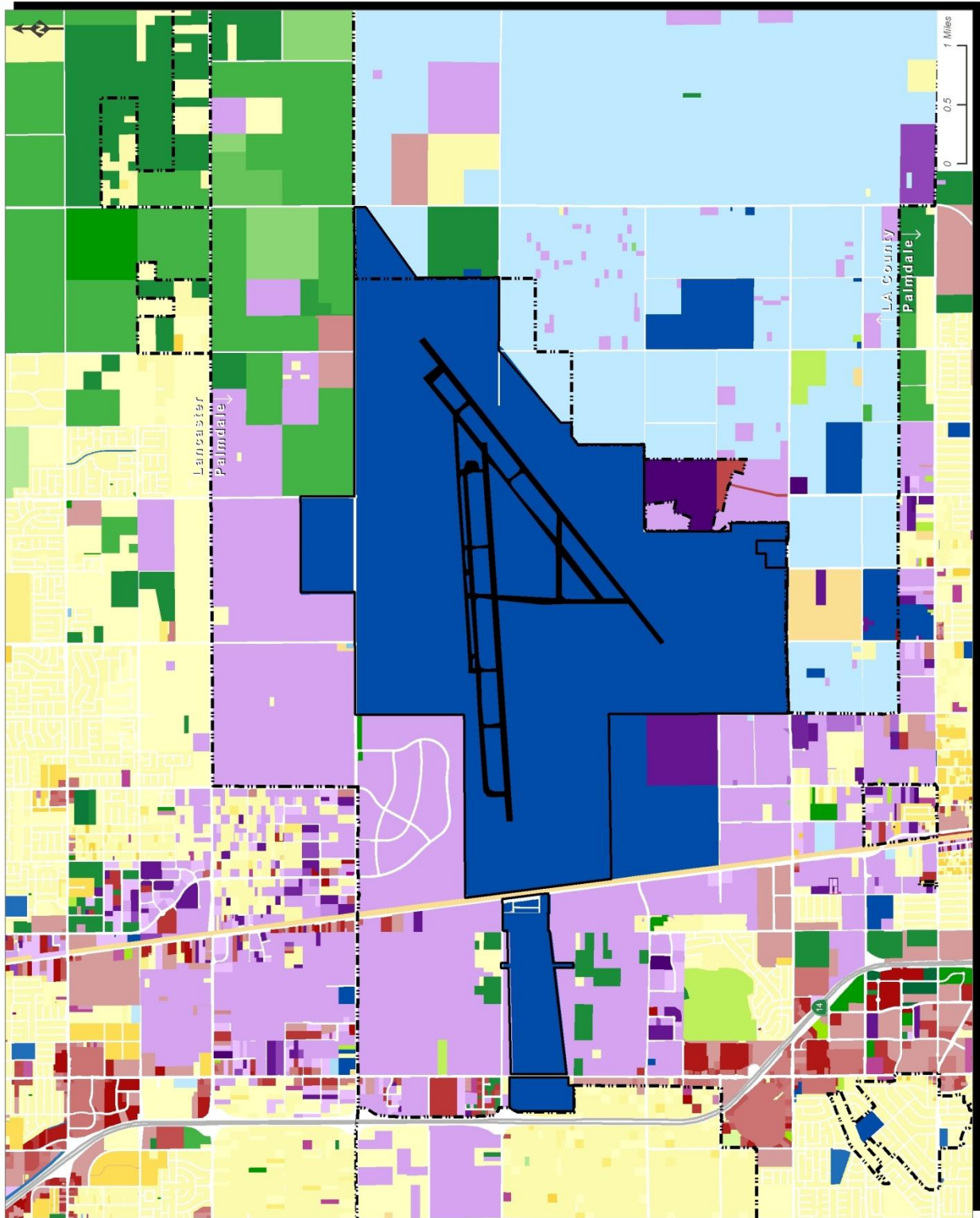
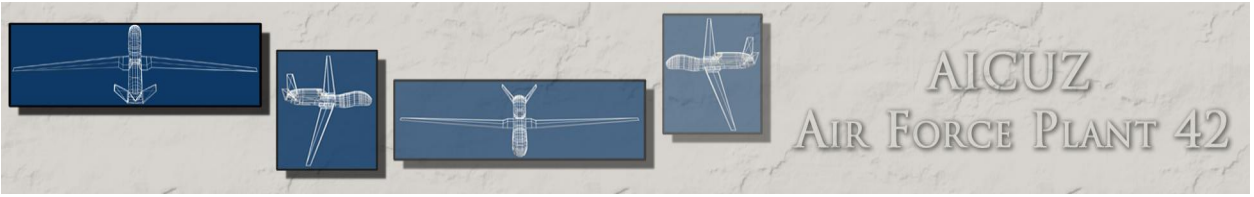


Figure 4-1. Existing Land Uses in the Region

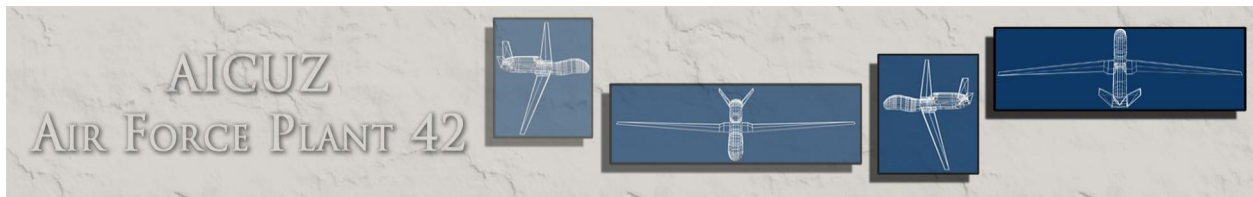


Air Force Plant 42

| County Boundary | Commercial | Government Owned | Industrial | Miscellaneous |
|-------------------------------|----------------------------------|--|------------------------------------|---------------------------------|
| Runway | Commercial, Animal Kennel | Government Owned Property, Open | Industrial, Heavy Equip | Miscellaneous, Dump Site |
| State Route | Commercial, Auto/Rec/Equip Sales | Government Owned Property, City Hall, Admin | Industrial, Industrial Parking | Miscellaneous, Pipeline, Canal |
| No Data | Commercial, Bank | Government Owned Property, College | Industrial, Light, Small Equip | Miscellaneous, Privately Owned |
| Agricultural | Commercial, Department Store | Government Owned Property, Elementary School | Industrial, Lumber Yard | Miscellaneous, Rights of Way |
| Dry Farm, Desert | Commercial, Hotel/Motel | Government Owned Property, Flood Control | Industrial, Mineral Processing | Miscellaneous, Rivers, Lakes |
| Dry Farm, Open | Commercial, Misc | Government Owned Property, Gov Services | Industrial, Misc | Miscellaneous, Utility |
| Dry Farm, Vacant Land | Commercial, Nursery/Greenhouse | Government Owned Property, High School | Industrial, Movie, Radio, TV | Miscellaneous, Vacant Land |
| Irrigated Farm, Feed Lot | Commercial, Office Building | Government Owned Property, Library | Industrial, Open | Recreational |
| Irrigated Farm, Field Crops | Commercial, Outlet | Government Owned Property, Public Housing | Industrial, Open Storage | Recreational, Athletic Facility |
| Irrigated Farm, Open | Commercial, Parking Lot | Government Owned Property, Public Park | Industrial, Vacant Land | Recreational, Bowling Alley |
| Irrigated Farm, Pumping Plant | Commercial, Professional Bldg | Government Owned Property, Public School | Industrial, Warehouse, Storage | Recreational, Club, Lodge |
| Irrigated Farm, Vacant Land | Commercial, Restaurant/Bar | Government Owned Property, Sewers, Utilities | Institutional | Recreational, Golf Course |
| Irrigated Farm, Vineyard | Commercial, Service Station | Government Owned Property, Streets | Institutional, Adult Care Facility | Recreational, Skating Rink |
| | Commercial, Service/Repair | Government Owned Property, Utility Office | Institutional, Cemetery, Mortuary | Recreational, Theater |
| | Commercial, Shopping Center | Government Owned Property, Vacant Land | Institutional, Church | Recreational, Vacant Land |
| | Commercial, Store | | Institutional, Hospital | Residential |
| | Commercial, Store Combo | | Institutional, Retirement Home | Residential, 3 Units/Apartments |
| | Commercial, Supermarket | | Institutional, School (Private) | Residential, 4 Units/Apartments |
| | Commercial, Vacant Land | | Institutional, Vacant Land | Residential, 5 Units/Apartments |
| | | | | Residential, Boarding House |
| | | | | Residential, Duplex/2 Units |
| | | | | Residential, Manuf Homes Park |
| | | | | Residential, Manufactured Homes |
| | | | | Residential, Single Unit |
| | | | | Residential, Vacant Land |

Source: Los Angeles County - Office of the Assessor; ESRI

Figure 4-1. Existing Land Uses in the Region (cont'd)



(5) Recreation—embodies land areas designated for recreational activity, including parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hiking, and camping.

(6) Open/Agriculture/Low Density—includes undeveloped land areas, agricultural areas, grazing lands, and areas with residential activity at densities less than or equal to one dwelling unit per acre.

4.2 Current Land Use

This section presents the municipalities that have tax or land-use jurisdiction in the vicinity of Plant 42, including descriptions of existing and future land uses, development controls (primarily zoning), and future land use plans.

The City of Palmdale exercises land-use control for the area immediately surrounding the north, west and southwest of Plant 42. The land directly east of Plant 42 although owned by the City of Los Angeles, specifically the LAWA, still remains subject to the jurisdiction of the municipality in which it sits, which in this case is the County of Los Angeles. The City of Lancaster is adjacent to Palmdale and lies north and northwest of the base. There are also some unincorporated areas of Los Angeles County interspersed within Palmdale and Lancaster city boundaries. Approximately 12 miles north of Plant 42 is the Los Angeles County/Kern County boundary, running approximately east/west.

4.2.1 Current Land Use – City of Palmdale

As noted, Plant 42 lies in the northern portion of, and entirely within, the City of Palmdale, California. This section of Palmdale is primarily industrial in character reflecting the presence of aircraft manufacturing facilities. Development patterns were influenced by the relatively flat terrain, the grid pattern of streets and the influence of the automobile on the layout. Although much of the existing development predates the AICUZ program, the city has been and remains an active partner with Plant 42 to enact land use controls in the AICUZ area of influence (the CZ/APZs and noise zones).

The city itself has experienced tremendous population growth, 31 percent over the past decade, and serves as an exurb of the employment centers in Los Angeles, Burbank, and Ontario.

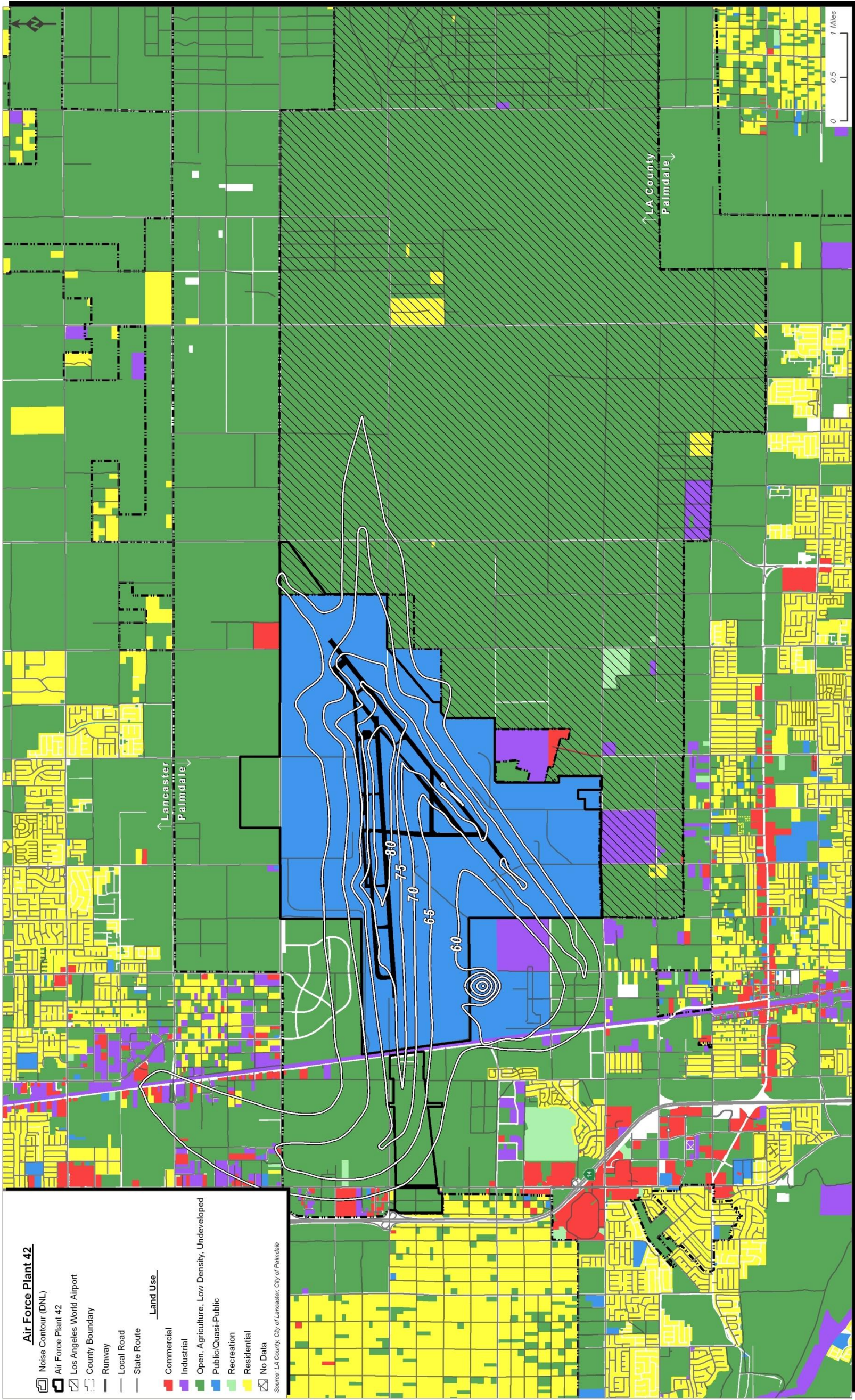
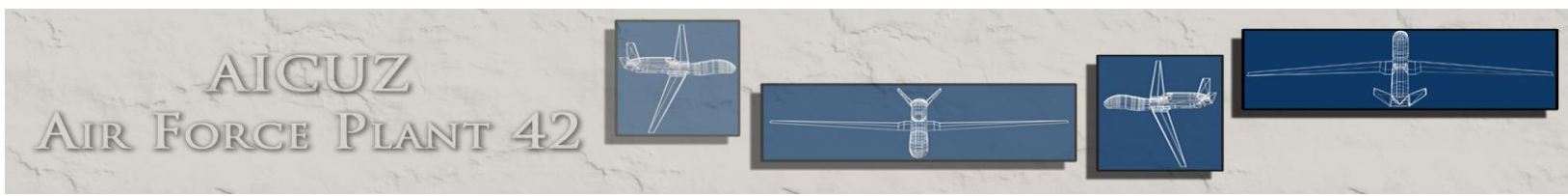
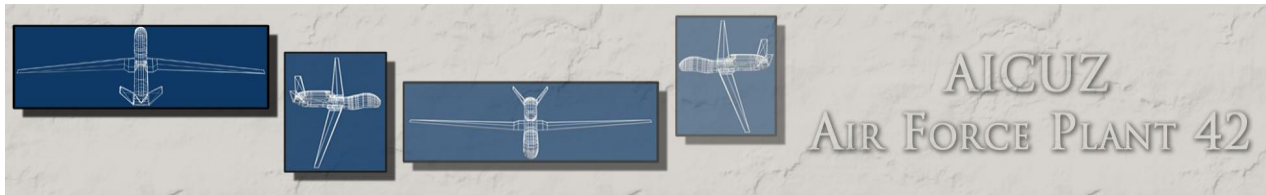


Figure 4-2. Existing Land Uses and 2010 Noise Contours



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4.2.1.1 Noise Zones

In general terms, the noise contours extend along the axes of the two intersecting runways and are largely confined to the installation. The 65 dB(A) DNL contour does, however, extend west and then north of Plant 42. In general terms and compared to other military airfields elsewhere in the country, Plant 42 is well buffered from incompatible uses with respect to noise and the contours overlies compatible land uses see (see Figure 4-2).

The 80+ contour associated with flight operations is wholly confined to the runway environment; an 80+ contour associated with aircraft maintenance engine runs lies off-installation but on the aircraft parking ramp of property owned by Lockheed Martin. In fact, test and maintenance operations are the source of the noise in this circumstance and this level of noise covering a relatively small area is inherent in the manufacture's operation of a test and depot maintenance facility for military aircraft.

The 75-80 noise zone overlies compatible vacant/open space land uses. The 70-75 noise zone similarly includes compatible open space uses. Only the 65-70 noise zone captures land uses that present potential incompatibilities, and then only on the western side of Plant 42 between State Route 14 and the Union Pacific Railroad main line. Specifically, a recreational use (driving range) on 10th Street West falls within the 65-70 contour. While generally compatible, such an outdoor recreational use can be adversely affected by aircraft noise (Tables 4-2 and 4-3).

4.2.1.2 Clear Zone/Accident Potential Zones I & II

Clear Zones

The CZ and APZs to the east of Runway 7/25 and to the northeast of Runway 4/22 mostly overlies agricultural land and open space. All of the Runway 7/25 East CZ and nearly all of the Runway 4/22 Northeast CZ overlies lands owned by Plant 42; a very small portion of the Runway 4/22 Northeast CZ overlies undeveloped land owned by LAWA. On the southwest and west side of the airfield, both the Runway 4/22 Southwest CZ and the Runway 7/25 West CZ are owned by Plant 42. Within the Runway 4/22 Southwest CZ and on Plant 42 is Site 7, currently occupied by Lockheed Martin. Portions of the hangars and manufacturing facilities lie within the current boundaries of the CZ; these structures were built prior to 1981 when the DoD expanded the

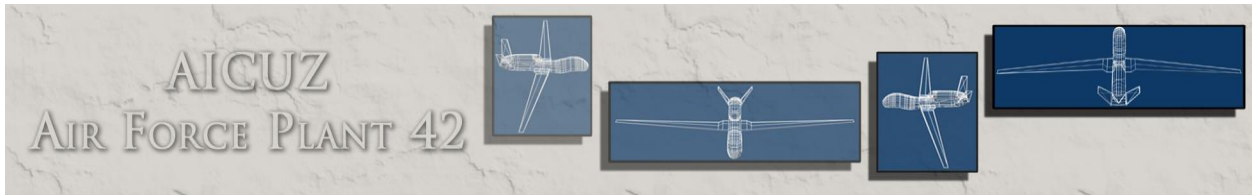


Table 4-2. Off Base Land Use within 65 dB+ Noise Contour

| Category | 2010 Acreage | 2002 Acreage |
|---------------------|-----------------|--------------|
| Residential | 0 | 0 |
| Commercial | 1.4 | 216 |
| Industrial | 15.7 | 73 |
| Public/Quasi-Public | 33.7 | 0 |
| Recreation | 7.5 | 0 |
| Open/Agriculture | 639.6 | 2,348 |
| Unclassified | 28.8 | 0 |
| Total | 726.7 | 2,637 |

Source: GMI, cities of Palmdale and Lancaster, and County of Los Angeles, California

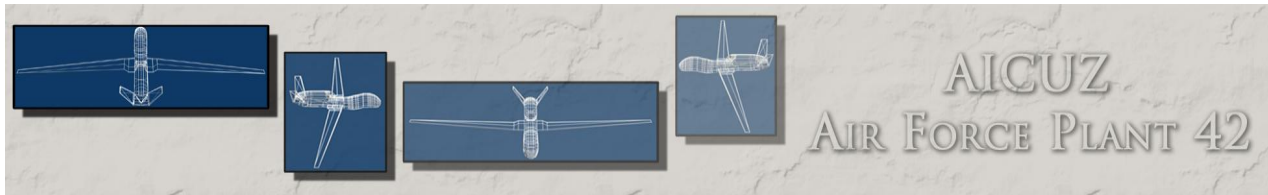
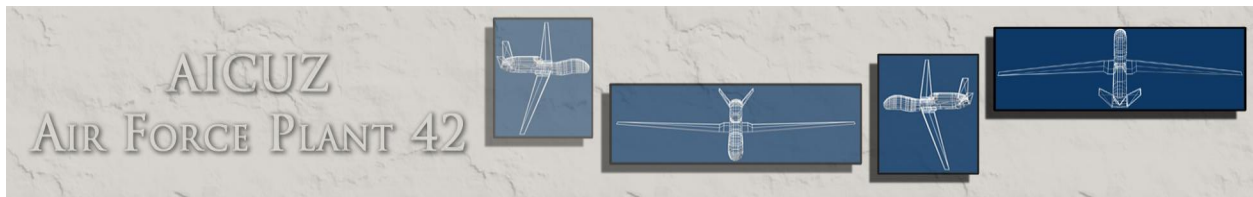


Table 4-3. Off Base Compatibility within Noise Contours

| Category | 65-69 | 70-74 | 75-79 | 80+ | Total |
|----------------------------------|--------------|--------------|--------------|------------|--------------|
| Residential | 0 | 0 | 0 | 0 | 0 |
| Compatible | 0 | 0 | 0 | 0 | 0 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Commercial | 1.4 | 0 | 0 | 0 | 1.4 |
| Compatible | 1.4 | 0 | 0 | 0 | 1.4 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Industrial | 10.3 | 4.1 | 1.2 | 0 | 15.7 |
| Compatible | 10.3 | 4.1 | 1.2 | 0 | 15.7 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Public/Quasi-Public | 17.4 | 11.9 | 4.4 | 0 | 33.7 |
| Compatible | 0 | 0 | 0 | 0 | 0 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Recreation | 7.5 | 0 | 0 | 0 | 7.5 |
| Compatible | 7.5 | 0 | 0 | 0 | 7.5 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Open/Agriculture | 532.3 | 101.2 | 6.2 | 0 | 639.6 |
| Compatible | 532.3 | 101.2 | 6.2 | 0 | 639.6 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| Unclassified (includes inter) | 14.9 | 11.5 | 2.4 | 0 | 28.8 |
| Compatible | 14.9 | 11.5 | 2.4 | 0 | 28.8 |
| Incompatible | 0 | 0 | 0 | 0 | 0 |
| TOTAL | | | | | 726.7 |

Source: GMI, cities of Palmdale and Lancaster, and County of Los Angeles, California

size of CZs from 1,500 feet wide (750 feet on either side of the runway extended centerline) to the current 3000 foot width. Other than this aircraft manufacturing, test, and maintenance facility, no



incompatible land uses exist in the CZs for the runways at Plant 42 (Figure 4-3; Table 4-4).

Accident Potential Zones

Further to northeast of Plant 42 but still within the city limits of Palmdale, the APZ I and part of the APZ II associated with Runway 4/22 overlie land devoted to agricultural, mining/extraction, and open space uses. These uses are compatible.

Further east falling within both Palmdale and unincorporated portions of Los Angeles County (primarily land owned by LAWA), the Runway 7/25 east APZ I and APZ II overlie similar agricultural and open lands. No incompatible land uses are noted on these lands.

By comparison, the areas to the southwest of Runway 4/22 and west of 7/25 contain somewhat more intense land uses. The APZs overlie primarily in the City of Palmdale with a very small portion of southwest APZ II associated with Runway 4/22 overlaying land in unincorporated Los Angeles County. Close in to the airfield, the southwest APZ I for Runway 4/22 is predominately undeveloped. Within the southwest APZ II for this runway, a mix of uses is present including residential (greater than one dwelling unit per acre), commercial (restaurant), public/quasi-public (church), industrial, and recreational (athletic complex/ball fields), as well as agricultural, and open space. The residential, restaurant, church, and recreational uses (to the extent they involve spectator sports, outdoor assembly of persons, or facilities of other than low intensity) are incompatible.

To the west of Plant 42, the APZ I for this end of Runway 7/25 is undeveloped. An eastern portion overlies the installation; however, most of it falls outside the installation over lands in the City of Palmdale. Within the western APZ II for this same runway, approximately two-thirds of the APZ II lies within the City of Palmdale (generally that portion that is west of State Route 14 or 12th Street West) with the balance overlying land in unincorporated Los Angeles County. Specifically in the Palmdale portion of the APZ II, the area between 10th Street West and APZ I is undeveloped. To the west of 10th Street West but east of State Route 14 or 12th Street West, a mixture of low to medium density

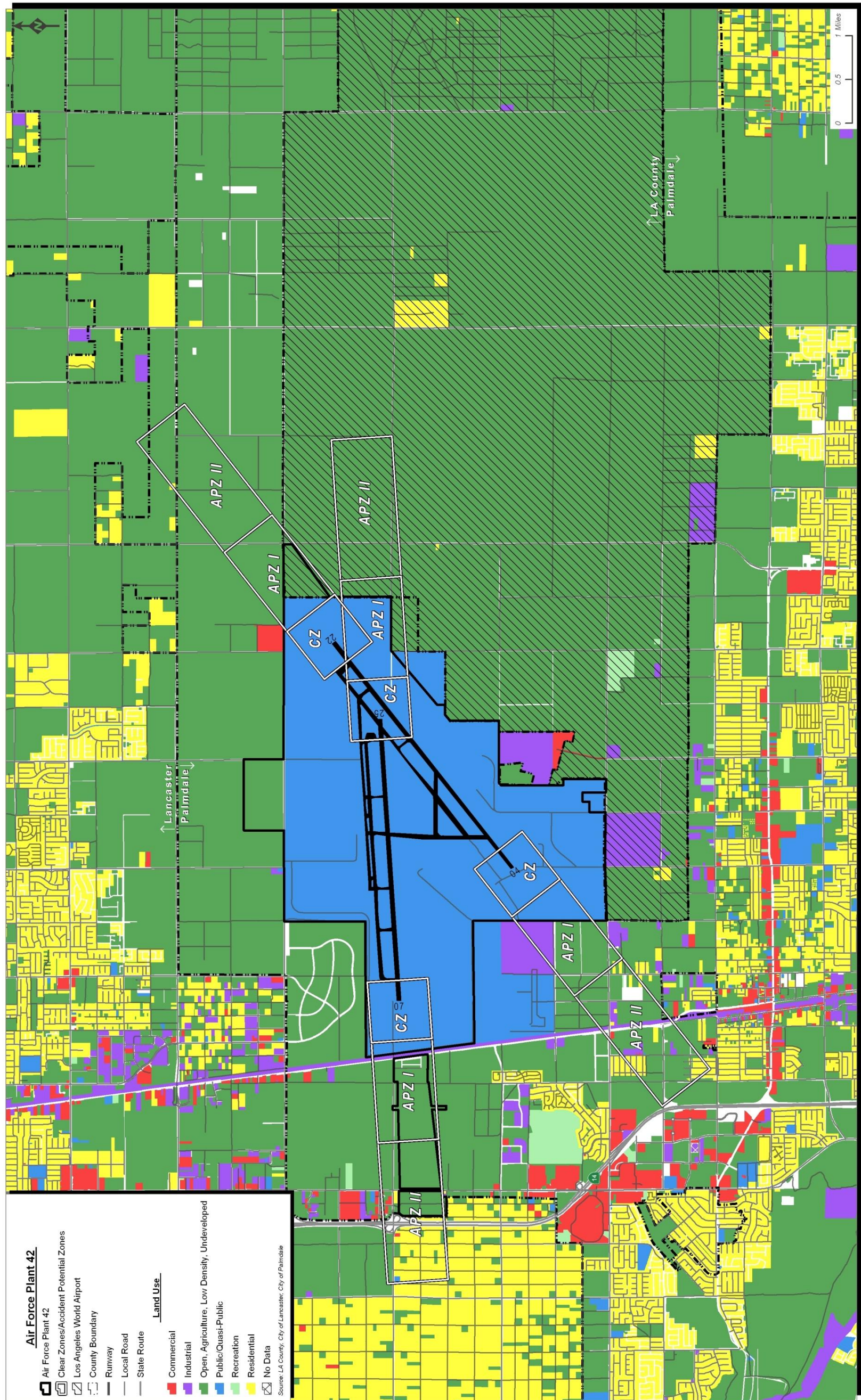
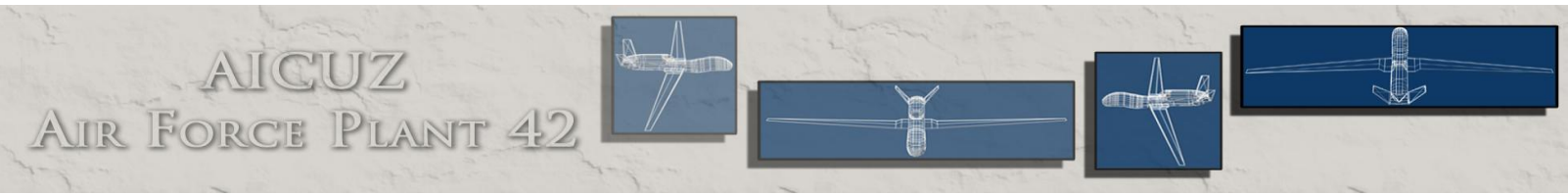


Figure 4-3. Existing Land Uses, CZs, and APZs



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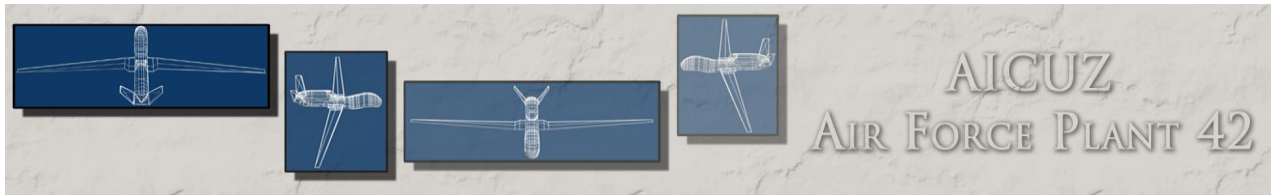


Table 4-4. Off Base Land Use Acreage for CZs and APZs

| Category | CZ | APZ I | APZ II | TOTAL |
|----------------------------------|-----------|--------------|---------------|---------------|
| Residential | 0 | 0.7 | 192.8 | 193.5 |
| Compatible | 0 | 0 | 179.4 | 179.4 |
| Incompatible | 0 | 0.7 | 13.4 | 21.1 |
| Commercial | 0 | 0.1 | 8.0 | 8.1 |
| Compatible | 0 | 0 | 7.5 | 7.5 |
| Incompatible | 0 | 0.1 | 0.5 | 0.6 |
| Industrial | 0 | 62.1 | 34.4 | 96.5 |
| Compatible | 0 | 62.1 | 34.4 | 96.5 |
| Incompatible | 0 | 0 | 0 | 0 |
| Public/Quasi-Public | 0 | 0 | 2.4 | 2.4 |
| Compatible | 0 | 0 | 0 | 0 |
| Incompatible | 0 | 0 | 2.4 | 2.4 |
| Recreation | 0 | 0 | 25.2 | 25.2 |
| Compatible | 0 | 0 | 25.2 | 25.2 |
| Incompatible | 0 | 0 | 0 | 0 |
| Open/Agriculture | 0.6 | 830.2 | 1515.3 | 2346.1 |
| Compatible | 0.6 | 830.2 | 1515.3 | 2346.1 |
| Incompatible | 0 | 0 | 0 | 0 |
| Unclassified (includes water) | 0 | 66.8 | 140.7 | 206.8 |
| Compatible | 0 | 66.8 | 140.7 | 206.8 |
| Incompatible | 0 | 0 | 0 | 0 |
| TOTAL | | | | 2878.6 |

Source: GMI, cities of Palmdale and Lancaster, and County of Los Angeles, California

residential uses (primarily fronting along the south side of N Avenue East, between 10th Street East and 12th Street East), medical office uses (primarily fronting along the north side of N Avenue East), a church, and open space/agricultural uses are present. Although low-density (less than 1-2 dwelling units per acre) single family residential use are compatible, the higher density residential use along with the church is not. Low intensity commercial/office uses are compatible. Figure 4-4 depicts the incompatible land uses.

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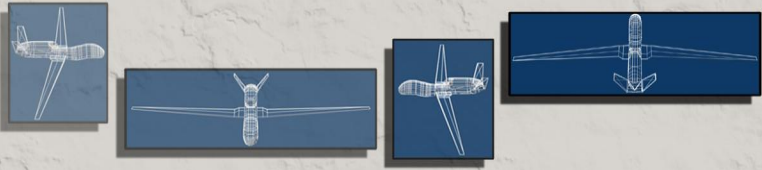
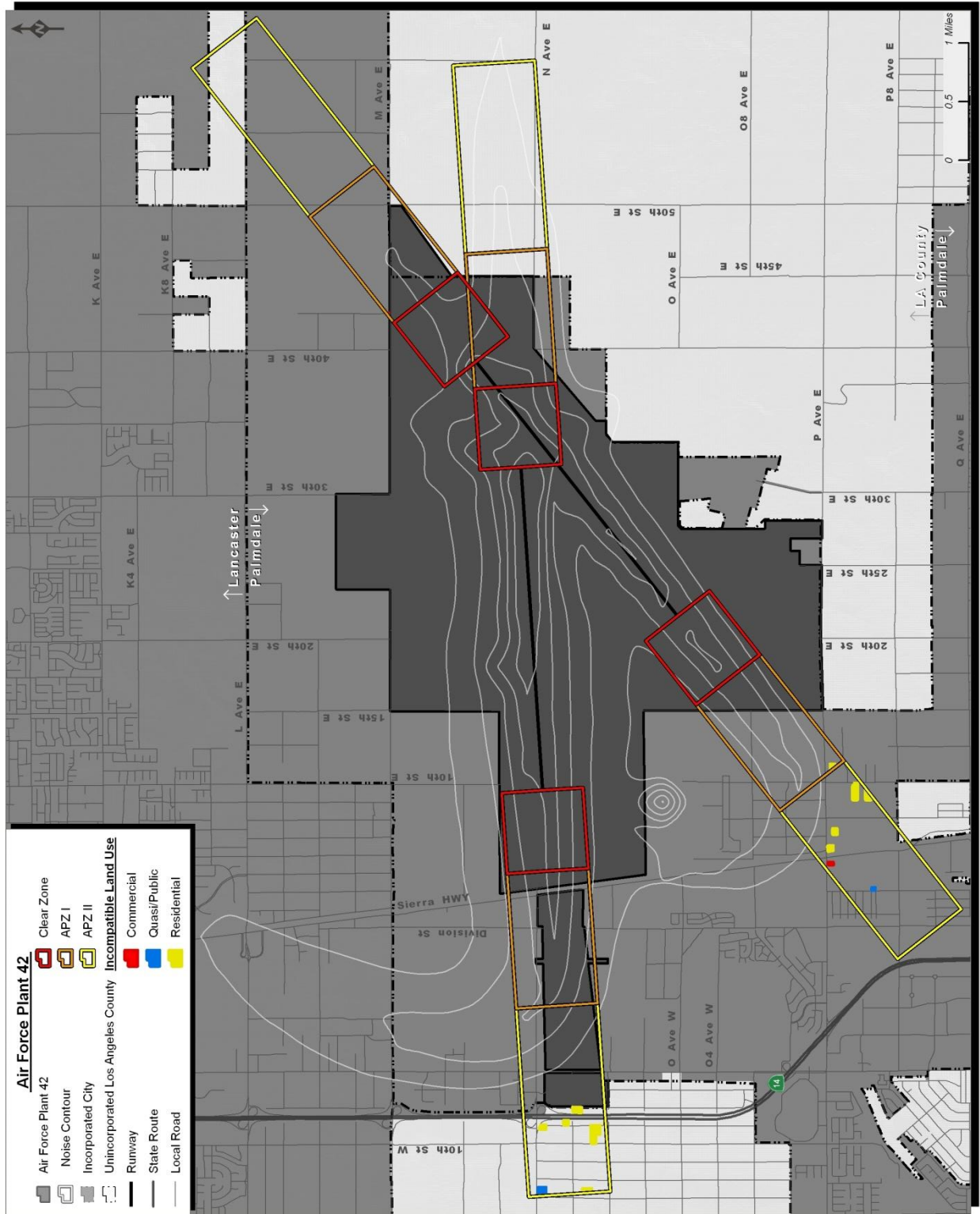
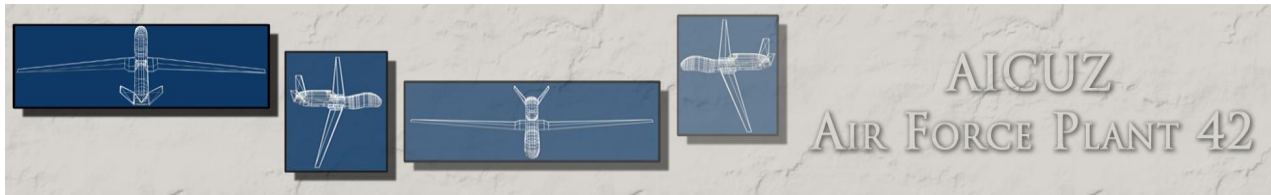



Figure 4-4. Incompatible Land Uses in Vicinity of Plant 42



4.2.2 Current Land Use – City of Lancaster

As previously noted, the City of Lancaster is north of and abutting the City of Palmdale. At its closest Point, Plant 42 lies within approximately one-half mile of lands lying within the City of Lancaster. In the area around Plant 42, the Lancaster/Palmdale boundary runs east/west along Avenue M to 10th Street East, turns north running along the centerline of 10th Street East, then turns eastward and then generally runs along Avenue L. Pockets of land lying within unincorporated Los Angeles County lie between Palmdale and Lancaster along the north side of Avenue L.

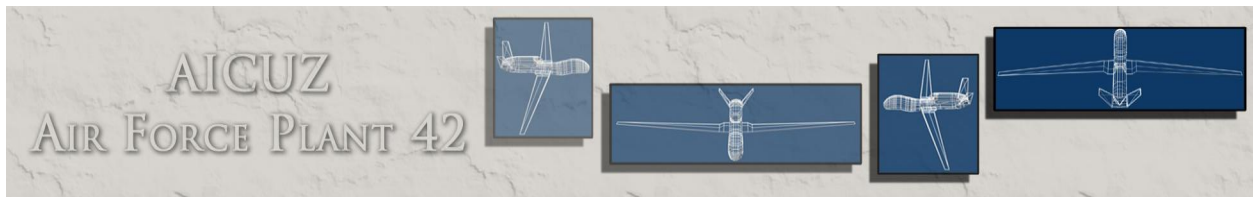
The section of Lancaster near Plant 42 is primarily residential in character. As with Palmdale, development patterns are influenced by the relatively flat terrain, the grid pattern of streets and the influence of the automobile on the layout. Lancaster has also been and remains an active partner with Plant 42 to enact land use controls in the AICUZ area of influence (the CZ/APZs and noise zones). Like Palmdale, the city itself has experienced tremendous population growth, 32 percent over the past decade, and serves as an exurb of the employment centers in Los Angeles, Burbank, and Ontario to the south and as a bedroom community for Edwards AFB to the north.

4.2.2.1 Noise Zones

A very small portion of the 65 dB(A) DNL noise contour that extends westward from Runway 7/25 and then turns northward paralleling State Route 14 and the Sierra Highway falls within the City of Lancaster, crossing the Lancaster/Palmdale boundary at Avenue M. Within this portion of the contour, industrial and warehousing uses exist. These uses are compatible with that level of predicted noise exposure.

4.2.2.2 Clear Zone/Accident Potential Zones I & II

None of the CZs overlie lands within the City of Lancaster. Only the northeast APZs associated with Runway 4/22 cross into Lancaster. Within the Runway 4/22 northeast APZ I, the land is largely undeveloped with agricultural uses predominating. Some structures and facilities supporting agricultural uses at the northwest corner of M Avenue East and 45th Street East are present; these uses are compatible.



4.2.3 Current Land Use – Los Angeles County

In the area around Plant 42, land that is not located within one of the two incorporated cities, Lancaster or Palmdale, would lie exclusively within Los Angeles County. There are numerous pockets of such land although most of it is located east and south of Plant 42 (the large parcels of land owned by LAWA) or along the north side of Avenue L between Lancaster and Palmdale. To the southwest and west of Plant 42, the pockets are less numerous and smaller in size; these areas generally result from the county residents declining to consent to annexation into a city.

Given the large geographical expanse of Los Angeles County, the barrier to transportation and development posed by the San Gabriel Mountains, as well as the population and number of incorporated cities within the county, it is not particularly meaningful to view the unincorporated areas Los Angeles County as a single entity for purposes of demographic analysis. Despite this, like their counterparts in incorporated areas, residents of Los Angeles County adjacent to or surrounded by either city or both have the potential to be affected by aircraft operations at Plant 42. Conversely, development policies adopted by the County of Los Angeles have the potential to encourage growth that could encroach upon and adversely affect operations at Plant 42.

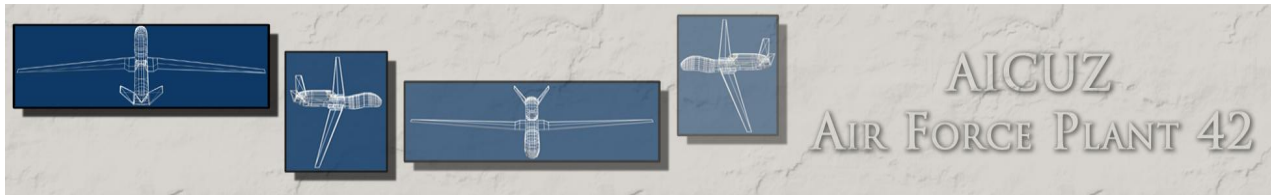
4.2.3.1 Noise Zones

Except for land owned by LAWA lying east of Plant 42, the noise contours resulting from operations at Plant 42 do not cross onto lands lying within unincorporated areas of Los Angeles County. As noted in the discussion of noise contours in Palmdale, the 80+ dB(A) DNL contour does not cross the base boundary. To the east of Plant 42 where the LAWA lands are, neither the 75-80 dB(A) DNL contour nor the 70-75 dB(A) DNL contour crosses the installation boundary. Only the 65 dB(A) DNL contour crosses into lands lying within Los Angeles County. Land uses underlying this contour east of Plant 42 are agricultural and therefore are compatible.

4.2.3.2 Clear Zone/Accident Potential Zones I & II

None of the CZs lie within the jurisdiction of Los Angeles County.

Portions of the APZs extend into unincorporated areas of Los Angeles County. The northeast APZ II associated with Runway 4/22 spans both Palmdale and Los Angeles County, with a



triangular portion east of 45th Street East and south of Avenue M East lying within the latter jurisdiction. This land is undeveloped. Within the northeast APZ II for the same runway, a similar circumstance occurs. A trapezoidal section of the APZ II, again containing undeveloped land, lies within an unincorporated section of Los Angeles County between the City of Palmdale boundary that runs along Avenue L East and the City of Lancaster boundary line that runs east/west approximately one-half mile to the north.

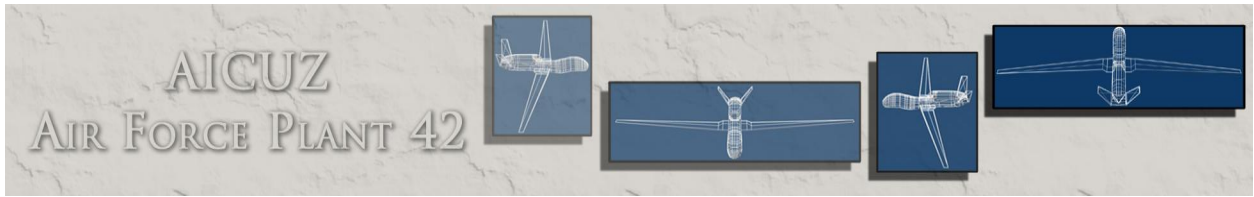
The Runway 7/25 East APZ crosses the installation boundary, which in this area also is the Palmdale city limit, onto land owned by LAWA located in the county. As with the other APZ's in the county, the lands are undeveloped and compatible agricultural uses predominate.

4.3 Current Zoning

This section examines the existing generalized zoning classifications as adopted by the jurisdictions in the region. Abbreviations are taken from the zoning ordinances and maps for each jurisdiction (see Figure 4-5). To match the generalized groupings that the Air Force uses for assessing compatibility of current land use, the zoning classifications employed by the jurisdictions have similarly been grouped (Figures 4-6 and 4-7). Like any real estate owned by the Federal government, Plant 42 itself is not subject to the jurisdiction of either the city nor the county in which it sits, Palmdale and Los Angeles County, respectively. Accordingly, land use control or regulation by the city or county does not apply to the real estate within the base boundary. Despite this immunity, the local zoning ordinance very much influences land use patterns around a military installation, can enable or discourage the development of compatible uses, and ultimately influences the viability of the mission at a military airfield.

4.3.1 Current Zoning – City of Palmdale

In 1917, California was one of the forerunners in adopting statewide enabling legislation allowing cities to undertake land use control and zoning. The City of Palmdale was incorporated in the early 1960s and its current zoning ordinance was adopted in 1994 and amended periodically since. The zoning ordinance is based on and implements its Master Plan, called the *Palmdale General Plan*, a general guide for future land use planning adopted by the City



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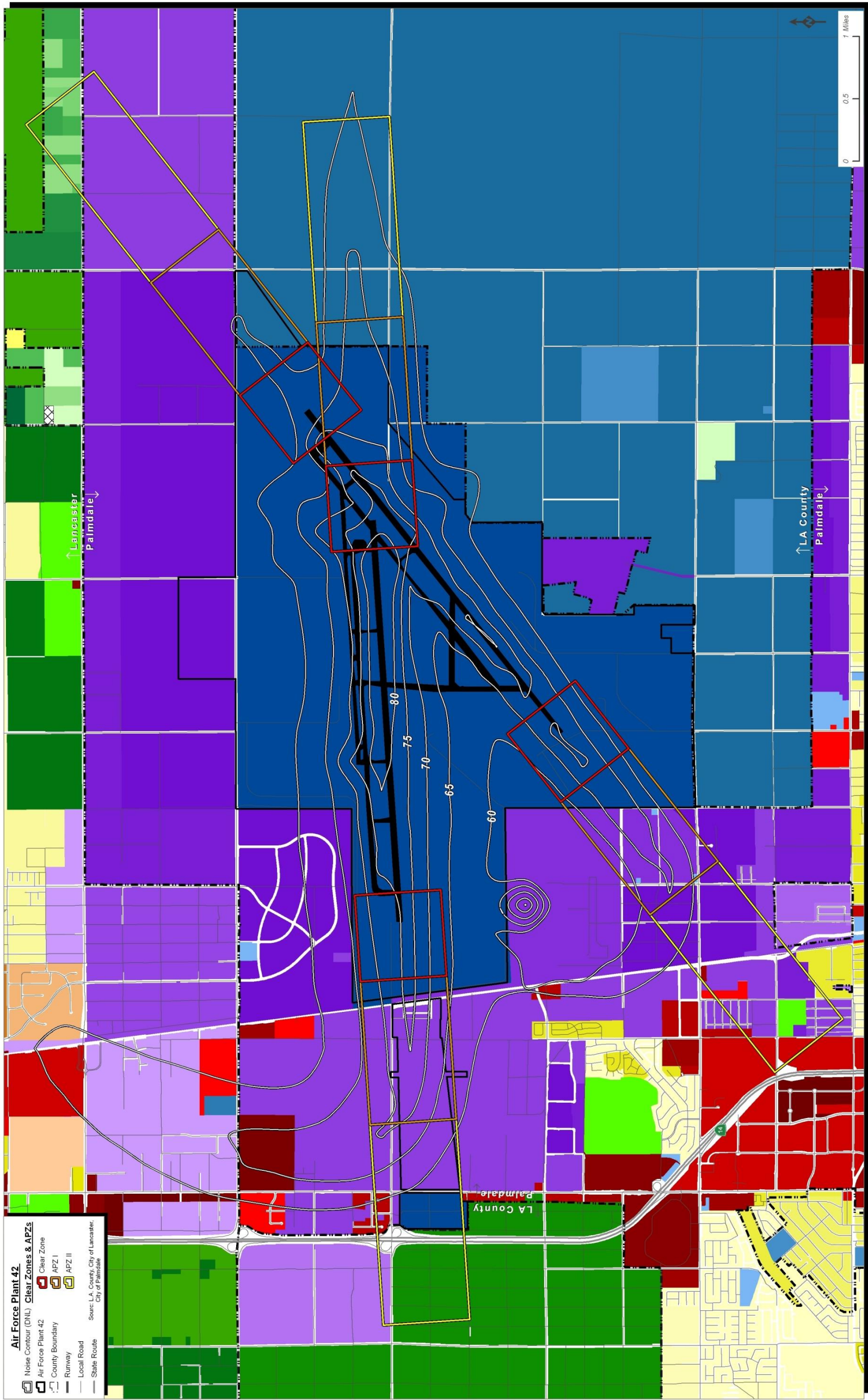
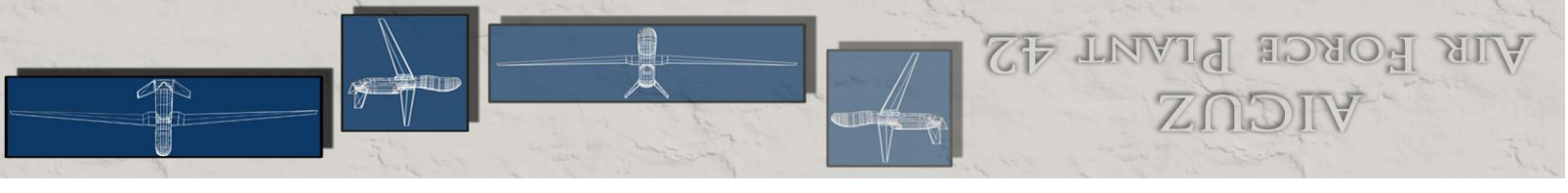


Figure 4-5. Detailed Parcel Zoning Classifications, Noise Contours, and APZs

| LA County Zoning | Lancaster Zoning | Palmdale Zoning |
|---|--------------------------------------|---|
| ■ Open, Ag, Low | ■ C;Commercial | ■ Ritter Ranch Specific Plan (SP-3) |
| ■ Agricultural;LCA 11 | ■ CPD;Commercial Planned Development | ■ Airport Industrial (M-3) |
| ■ Agricultural;LCA11-A22-A25 | ■ H;Hospital | ■ Prezone Airport Industrial (M-3 PZ) |
| ■ Agricultural;LCA21 | ■ MU-C;Mixed Use Commercial | ■ Prezone Public Facility (PF PZ) |
| ■ Agricultural;LCA21-A25 | ■ MU-E;Mixed Use Employment | ■ Open Space and Recreation (OR) |
| ■ Agricultural;LCA22 | ■ MU-N;Mixed Use Neighborhood | ■ Prezone Open Space and Recreation (OR PZ) |
| ■ Agricultural;LCA25 | ■ OP;Office Professional | ■ City Ranch Specific Plan (SP-2) |
| ■ Agricultural;LCA25-A21 | ■ California Aqueduct; | ■ Hillside Residential Specific Plan (SP-7) |
| ■ Agricultural;Open, Ag, Low | ■ HI;Heavy/Light Industrial | ■ Joshua Hills Specific Plan (SP-4) |
| ■ Agricultural;PDA11 | ■ LI;Heavy/Light Industrial | ■ Medium Residential (R-2) |
| ■ Agricultural;PDA25 | ■ O;Open Space | ■ Multiple Residential (R-3) |
| ■ LCN-2 | ■ RR-1;Rural Residential | ■ Palmdale Transit Village Specific Plan (SP-??) |
| ■ Commercial;LCC4-R17500 | ■ RR-2.5;Rural Residential | ■ Prezone Medium Residential (R-2 PZ) |
| ■ Manufacturing/Industrial;PDM2 1/2-A25 | ■ CE;Cemetery | ■ Prezone Multiple Residential (R-3 PZ) |
| ■ Manufacturing/Industrial;PDM4 | ■ P;Public | ■ Prezone Single Family Residential (R-1-1 PZ) |
| ■ Manufacturing/Industrial;PDMI | ■ S;School | ■ Prezone Single Family Residential (R-1-15,000 PZ) |
| ■ Manufacturing/Industrial;PDMPI | ■ PK;Park | ■ Prezone Single Family Residential (R-1-20,000 PZ) |
| ■ Manufacturing/Industrial;POM11/2-A25 | ■ RC;Resource Conservation | ■ Prezone Single Family Residential (R-1-7,000 PZ) |
| ■ No Data | ■ HDR;Residential | ■ Rancho Vista Specific Plan (SP-5) |
| ■ Residential;LRR2.5 | ■ MDR;Residential | ■ Single Family Residential (R-1-1) |
| | ■ MHP;Residential | ■ Single Family Residential (R-1-10,000) |
| | ■ R-10,000;Residential | ■ Single Family Residential (R-1-12,000) |
| | ■ R-15,000;Residential | ■ Single Family Residential (R-1-13,000) |
| | ■ R-7000;Residential | ■ Single Family Residential (R-1-15,000) |
| | ■ SRR;Residential | ■ Single Family Residential (R-1-2.5) |
| | ■ SP80-01;Specific Plan | ■ Single Family Residential (R-1-20,000) |
| | ■ SP80-02;Specific Plan | ■ Single Family Residential (R-1-7,000) |
| | ■ SP80-03;Specific Plan | |
| | ■ SP81-01;Specific Plan | |
| | ■ SP90-01;Specific Plan | |
| | ■ SP;Specific Plan | |

Source: Los Angeles County - Office of the Assessor, City of Palmdale, City of Lancaster

Figure 4-5. Detailed Parcel Zoning Classifications, Noise Contours, and APZs (cont'd)

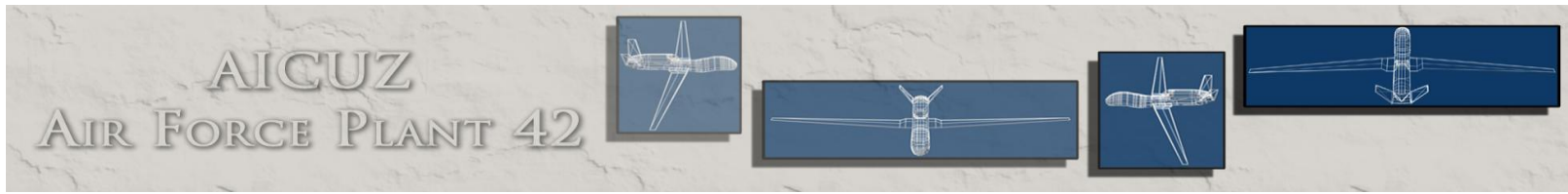




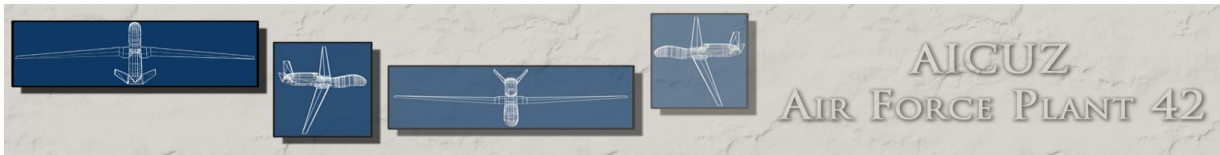
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Figure 4-6. Generalized Zoning, Noise Contours, and APZs



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Council in 1993. The *Palmdale General Plan* is a carefully designed policy that has been prepared to guide the city's growth and development in an orderly and efficient manner. The Master Plan and its implementing strategies (including zoning text or mapping changes) look forward in time for about 20 years, and it periodically is updated as conditions warrant.

In addition to traditional zoning classifications that group permissible uses, segregate incompatible ones, and regulate density and other features of development (e.g., minimum lot widths, setbacks, maximum height limits, provision of off-street parking, maximum signage), the Palmdale Zoning Ordinance also uses a variety of other techniques including conditional use permits, overlay zoning, and site plan reviews for certain permitted uses within a given zoning district.

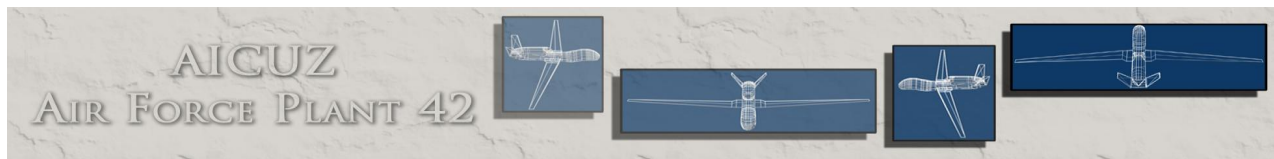
Noise Contours

Current Zoning is based upon the 2002 AICUZ noise contours, which included noticeably larger land areas within the noise contours. Since the 2010 noise contours generally fall on the base, incompatible zoning classifications with respect to noise are not a significant issue in Palmdale. Two points should be kept in mind when examining the noise environment at Plant 42: first, the contours vary over time as missions change and various airframes are stationed at the base; and second, aircraft noise does not stop at a contour boundary.

Under current conditions, no portion of the 65 dB(A) DNL contour overlies land with incompatible residential zoning. In the near term this condition is likely to continue. As noted in Chapter 3 of this document, the nature of the terrain, the climate (winds), air traffic at higher altitudes, and the location of Edwards AFB to the north influence the flight tracks and resulting noise contours; it would take a fairly pronounced change in mission (aircraft types using Plant 42) or operational intensities for some of the existing residential zoning classifications in areas southwest, or west of the installation to then become incompatible as a result of a contour shift. However, demands for use of the airfield, primarily by transient organizations, continue to indicate that longer term increased use of the airfield may indeed occur.

Accident Potential

Assessing compatible zoning for accident potential is best done by examining the west side of the base separately from the east side. Both the CZ at the arrival end of Runway 22 and the CZ at the arrival end of Runway 25 are nearly entirely within the boundaries



of Plant 42; they are zoned for Public/Quasi-Public uses reflecting their ownership by Plant 42. These classifications are compatible. The zoning classifications underlying the APZ I and APZ II at the northeast end of Runway 4/22 are largely compatible. The predominant zoning classification is again Public/Quasi Public for the LAWA land or Industrial and Agricultural. Similar zoning pertains to the APZ I and II at the east end of Runway 7/25; these lands are further protected by virtue of their being owned by LAWA. No incompatible residentially zoned real estate lies in either CZ on the east side of Plant 42 nor in any of the four APZs on this side of the airfield.

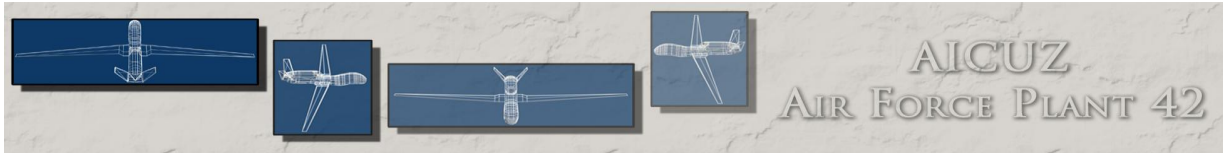
Both the CZs on the southwest and west side of Plant 42 also lie entirely within the installation boundary. Their Public/Quasi-Public zoning classifications reflect the government ownership of Plant 42. Although this zoning classification can allow incompatible uses (e.g., a school, church, or park not owned by the Air Force), it nonetheless is an appropriate classification for the installation.

At the southwest end of Runway 4/22, the predominant zoning classification is industrial, with residential, public/quasi-public use, and commercial zoning classifications making up the balance. For both APZ I and II, residential zoning is incompatible and public/quasi-public zoning typically permits uses that also are incompatible. Within APZ I, the commercial zoning classification may permit either compatible or incompatible uses depending upon the particular use proposed. The primary determinant of compatibility within the APZs are the degree to which the uses promote assembly of large numbers of persons within relatively small land areas.

4.3.2 Current Zoning – City of Lancaster

The City of Lancaster shares a similar history to Palmdale, its neighbor immediately to the south. The development of Edwards AFB (originally Muroc Army Airfield) in the 1930s, coupled with the development of Plant 42 in the 1950s, helped to establish Lancaster as a bedroom community for those employers. The construction of the Antelope Valley Freeway (State Route 14) in the late 1960s made commuting to Los Angeles feasible and relatively lower cost housing contributed to the population growth. By 1977 a sufficient number of votes in favor of incorporation were cast.

The City's current zoning ordinance was adopted in 1979 as a successor ordinance to the *Los Angeles County Zoning Ordinance*



then in effect and it has been amended periodically since. The zoning ordinance is based on and implements its Master Plan, called the *General Plan 2030*, a general guide for future land use planning adopted by the City Council in 2009. The *General Plan 2030* is a carefully designed policy that has been prepared to guide the city's growth and development in an orderly and efficient manner. The Master Plan and its implementing strategies (including zoning text or mapping changes) looks outward in time for about 20 years, and periodically is updated as conditions warrant.

In addition to traditional zoning classifications that group permissible uses, segregate incompatible use, and regulate density and other features of development (e.g., minimum lot widths, setbacks, maximum height limits, provision of off-street parking, maximum signage), the Lancaster Zoning Ordinance also uses a variety of other techniques including conditional use permits, overlay zoning, and site plan reviews for certain permitted uses within a given zoning district.

Noise Contours

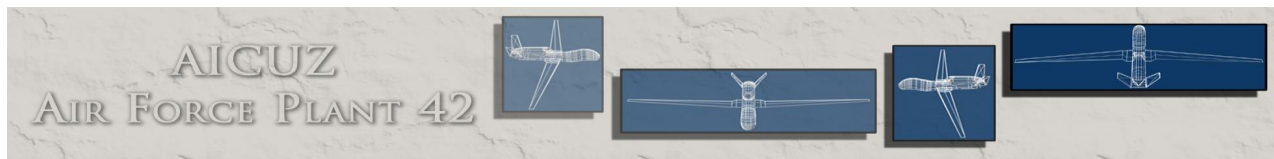
As noted in §4.2.2.1 above, a very small portion of the 65 dB(A) DNL noise contour that extends westward from Runway 7/25 and then turns northward paralleling State Route 14 and the Sierra Highway falls within the City of Lancaster, crossing the Lancaster/Palmdale boundary at Avenue M. This area is zoned for industrial uses which are compatible with this level of predicted noise exposure.

Accident Potential

As with the predicted noise exposure contours, relatively few of the areas having increased accident potential overlie land in the City of Lancaster. None of the CZs are in Lancaster. Only a small portion of APZ II northeast of Runway 4/22 overlies lands in this city. These lands are zoned for Agricultural or Low-Density Residential use, which is compatible provided densities do not exceed one dwelling unit per acre.

4.3.3 Current Zoning – Los Angeles County

Los Angeles County has been settled for hundreds of years and has had a zoning ordinance and maps since the 1920s. Lands presently lying within the cities of Lancaster and Palmdale previously were in unincorporated parts of Los Angeles County prior to those cities' incorporations or their addition to either of those cities through a subsequent annexation. The zoning ordinance



implements the *Los Angeles General Plan*, adopted in 1980 as well as the *Antelope Valley Area-Wide General Plan* adopted in 1986. An update to the *Los Angeles General Plan* is underway and a draft document is available to the public. Like Master Plan documents for the cities of Palmdale and Lancaster, these planning documents set the framework for development that zoning ordinances (among other tools) implement. Similar to the zoning in the cities of Palmdale and Lancaster, the Los Angeles County zoning ordinance makes use of the same techniques of segregation of incompatible uses, regulation of density and review of development proposals.

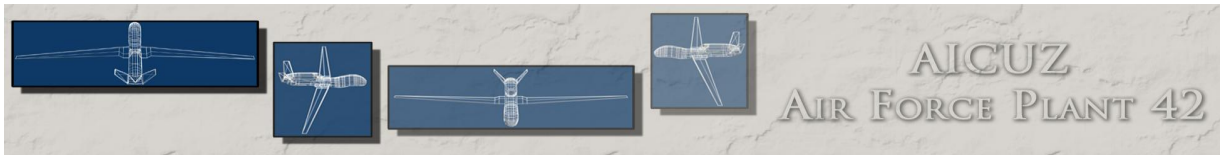
Noise Contours

As described in §4.2.2.1 above, the LAWA land east of Plant 42 is the only area of unincorporated Los Angeles County that lies within an area of elevated predicted noise exposure. These lands are zoned for Public/Quasi-Public use, reflecting the future intent of LAWA to develop an airport as a reliever to LAX, BUR, and ONT. This zoning is compatible.

Accident Potential

Portions of the APZs extend into unincorporated areas of Los Angeles County both to the east and the west. The Northeast APZ II associated with Runway 4/22 spans both Palmdale and Los Angeles County, with a triangular portion east of 45th Street East and south of Avenue M East lying within the latter jurisdiction. This land is undeveloped and is zoned for Public/Quasi-Public use, again reflecting the intent LAWA has for future development of an airport. Within the northeast APZ II for the same runway, a similar circumstance occurs. A trapezoidal section of the APZ II, again containing undeveloped land, lies within an unincorporated section of Los Angeles County between the City of Palmdale boundary that runs along Avenue L East and the City of Lancaster boundary line that runs east/west approximately one-half mile to the north. This land is zoned Open Space, Agricultural or Low-Density Residential. In both cases, the zoning is compatible provided the residential density does not exceed one dwelling unit per acre.

The East APZ I and APZ II overlay the LAWA land. These areas are zoned to Public/Quasi Public uses reflecting the future airport use. The West APZ II for Runway 7/24 is zoned for Industrial, Agricultural and Open Space uses which are compatible zoning classifications.



4.4 Future Land Use

This section examines the comprehensive land use plans adopted by the local jurisdictions and assesses the extent to which recommended changes to land use patterns could generate potential conflicts with the Air Force mission at Plant 42. As was done with existing land use and current zoning classifications, recommended future land uses (maps) from the surrounding jurisdictions have been consolidated for purposes of this AICUZ study (Figure 4-7).

Much of the area surrounding AFP 42 has already been developed; and those areas that are undeveloped have primarily been designated for compatible land uses. There are significant areas to the north and east of AFP 42 that are currently vacant or in agricultural uses, including over 17,000 acres of land that is owned by the Los Angeles World Airports (LAWA) that has been specifically reserved for potential future airfield uses. Some of these land areas have seen inquiries for development for solar energy uses, which would need to be reviewed on a case by case basis to ensure compatibility. It is recommended that LAWA continue to support AFP 42 by preserving these land areas for continued airport uses. Land areas to the northeast, east, and south of AFP 42 will likely see more in the way of infill development or re-development rather than conversion of agricultural or open space uses to more intensely developed uses.

Land use planning and its implementation through public infrastructure investment and zoning ordinances inherently involve a balancing of competing interests. Among the factors community leaders necessarily consider are the need to accommodate population growth, economic opportunity, and provision of public services. This process is a continuous one.

The cities of Palmdale and Lancaster, along with Los Angeles County employ a multi-tiered, comprehensive planning process. A conceptual framework is outlined in a Master Plan and supplemental area-wide plans, adopted by the Planning Commissions and governing bodies. These documents outline broad policy themes to guide future planning efforts, as well as any changes to zoning text/classifications or re-mapping of zoning districts. The jurisdictions respective Master Plans would also inform area-specific subsidiary planning efforts and capital investment in infrastructure for public services and recreation.

Much of the focus of these plans center on sustainable growth, green infrastructure, and quality of life issues. In more concrete

AICUZ
AIR FORCE PLANT 42



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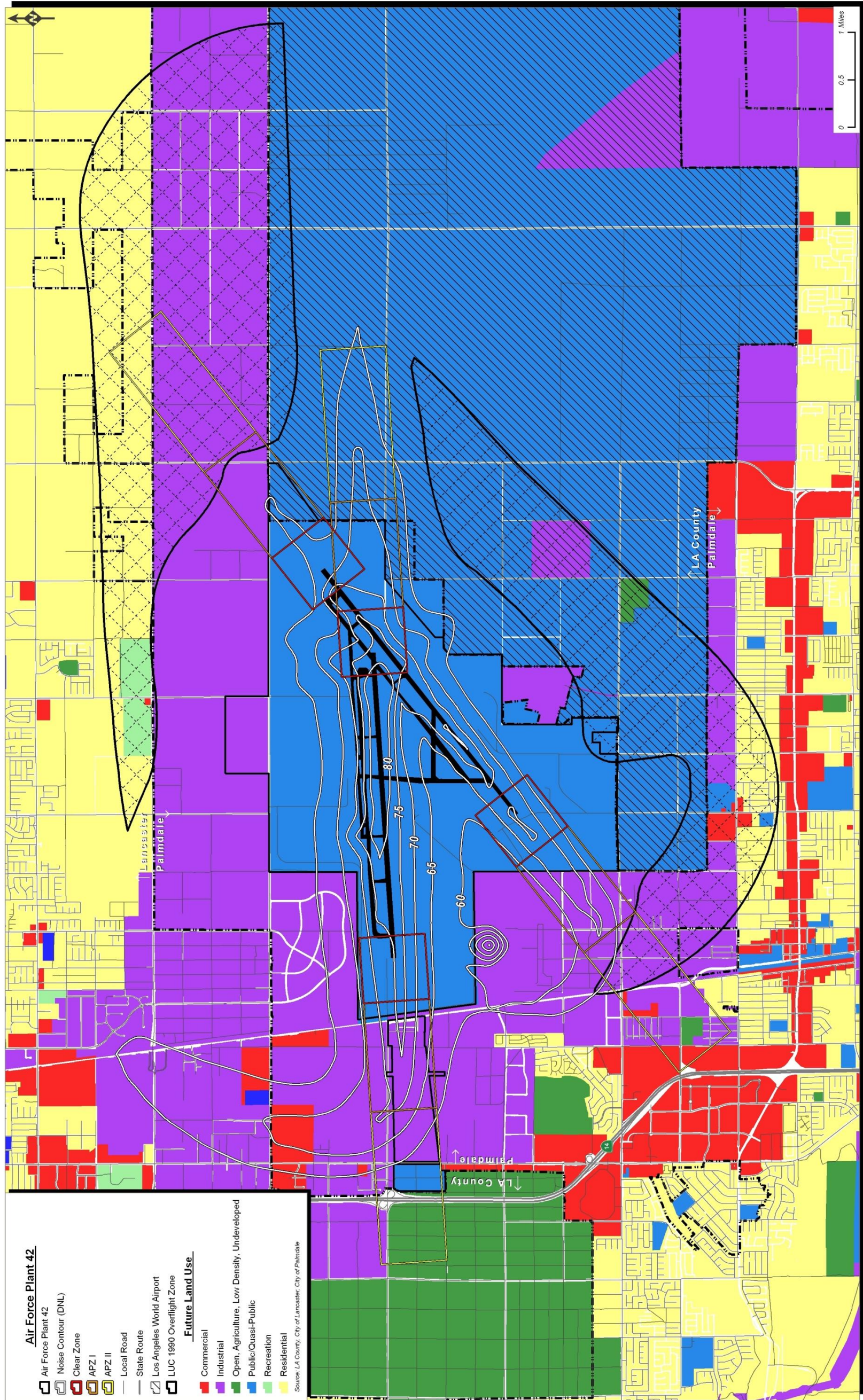
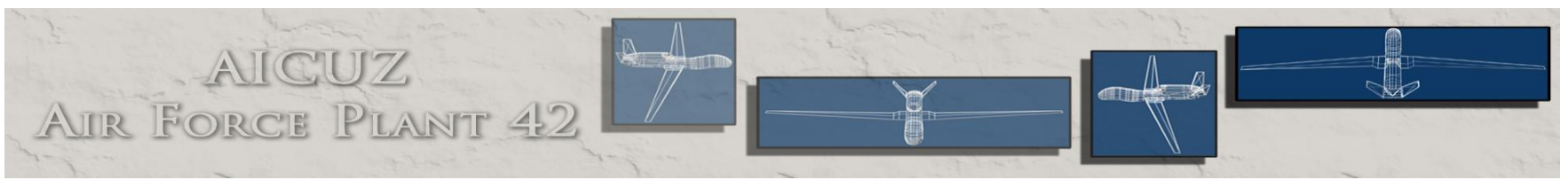
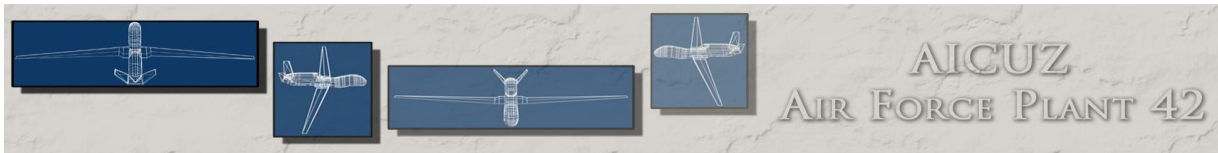


Figure 4-7. Generalized Future Land Use Plan



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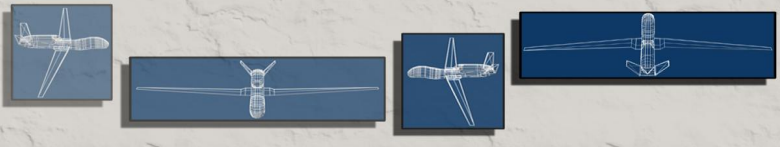
terms, that means preservation of the wetlands and floodplains, protection of hillsides with highly erodible soils, recognition of seismic zones, protection of viewsheds and cultural resources, in addition to other policy objectives pertaining to fostering orderly housing and commercial development and employment growth. The objectives are compatible with the mission at Plant 42. Channeling and focusing residential growth into suitable areas would not present a land-use conflict in and of itself. However, to the extent new construction or redevelopment of housing stock, higher intensity office or retail uses, schools, outdoor recreational facilities, or medical facilities might occur, the community should be mindful of the base's flying mission and remain cognizant that the airfield's operations can vary. Should the mission of the installation change or if air traffic control procedures were to change, it is possible that predicted noise exposure could increase. There is evidence that the jurisdictions are attuned to this and they each have demonstrated an ongoing commitment, reinforced by policies at the state government level to planning for and enforcing compatible land uses.

During the development of future Land Use Plans, the jurisdictions should continue to validate the detailed land use compatibility studies previously undertaken for the areas having increased potential for aircraft noise and accidents. These plans should continue to encourage development of compatible land uses. As area-specific planning documents and corresponding capital improvement public investment decisions are made, the mission of Plant 42 should be kept in mind and decisions that would tend to foster development of incompatible land uses should be avoided.

4.4.1 Future Land Use – City of Palmdale

The City of Palmdale recognizes the importance of Plant 42 to the vitality of the city and the Antelope Valley region in general. It has been proactive in preventing land use conflicts with the mission of Plant 42. The *Palmdale General Plan* specifically has as one of its goals to “[p]rotect and promote a variety of air transportation services within the City of Palmdale.” Supporting objectives include “Protect[ing] opportunities for full utilization and expansion of Air Force Plant 42.” Specific policies set forth in the *Palmdale General Plan* for achieving these include:

- Adopting land use designations which minimize encroachment of incompatible uses;
- Coordinating development policies and decisions with Plant 42 representatives;



- Restricting encroachment of incompatible uses onto land affected by future LAWA operations; and
- Supporting regional transportation planning for surface routes serving the proposed airport facilities including State Routes 14 and 138.

To the extent that these policies and recommendations continue to be implemented through zoning, capital improvements, and subdivision controls, this should generally yield compatible land uses.

4.4.2 Future Land Use – City of Lancaster

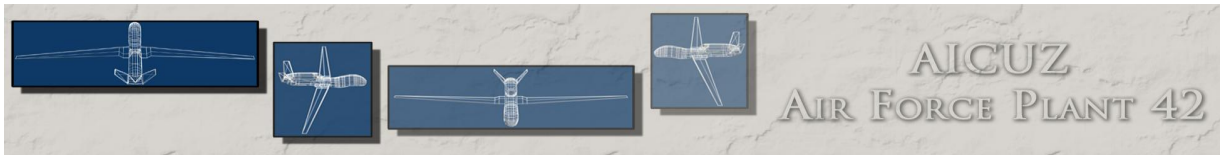
In a similar vein, the City of Lancaster has expressed in its *General Plan 2030* that Plant 42, along with Edwards AFB to the north, are both significant contributors to the economic activity in the region. Among the goals expressed in that document are to:

- Ensure compatibility between land uses in the City of Lancaster and air operations from U.S. Air Force Plant 42 (Palmdale Regional Airport), Fox Field, and Edwards Air Force Base.
- Promote a regional perspective in land use decisions affecting the residents of Lancaster.

Specific strategies for achieving these include limiting residential development densities to no greater than 1 dwelling unit per 2.5 acres (below the 1 unit per acre threshold of compatibility in a 65 dB(A) DNL or APZ II). For commercial development, uses having a concentration of persons of 25 or greater, per acre, per 24-hour period would be discouraged in the APZ II. To promote a regional perspective in decisions involving land use, the City of Lancaster endeavors to solicit comments from Air Force officials for uses in the AICUZ environs. The document also contains numerous references to best practices found in the *California Airport Land Use Planning Handbook* through which the land use compatibility objectives set forth in the State Aeronautics Act are achieved.

4.4.3 Future Land Use – Los Angeles County

The 1980 *Los Angeles General Plan* and the 1986 *Antelope Valley Area-Wide General Plan* both recognize Plant 42 role in the vitality of the North Los Angeles County planning area. Further, the County Regional Planning Commission serves as the ALUC under the State Aeronautics Act. In that capacity, they have updated and adopted the *Los Angeles County Airport Land Use*



Plan in 2004 as required by state law. These efforts all reinforce and complement each other in seeking to foster compatible land uses around all of the military and public use airfields in the county.

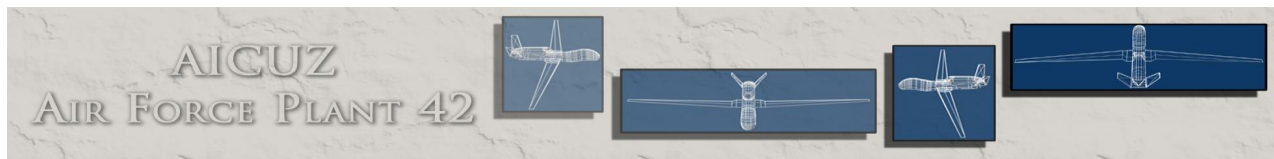
The 2008 draft *Los Angeles General Plan*, like the documents of the cities of Palmdale and Lancaster, includes policy statements, goals and objects to guide zoning and investment decisions. Such policies recommend that the County should:

- Ensure airport operation compatibility with adjacent land uses through Airport Land Use Plans.
- Utilize land uses, such as parks and commercial uses, to buffer noise-sensitive uses from excessive noise impacts.
- Ensure compliance with the State Noise Insulation Standards (Title 24, California Code of Regulations and Chapter 35 of the Uniform Building Code), such as noise insulation of new multifamily dwellings constructed within the 60 dB (CNEL or Ldn) noise exposure contours

With respect to Plant 42, the most significant item in all these plans is the continued recommendations and policies that support reservation of lands east of the installation (owned by LAWA) for a future airport. This assembly of over 17,000 contiguous, undeveloped acres in public ownership serves as an effective buffer from incompatible uses.

4.4.4 1990 Joint Land Use Committee

As noted on the Future Land Use Map, in addition to local zoning criteria, the Air Force, City of Lancaster, City of Palmdale, and LAWA established a Joint Land Use Committee (JLUC) to organize and integrate into one document the various planning efforts and decisions relating to land use around AFP 42 that existed at that time. The JLUC published a report in 1990 that provides land use policies and requires all local jurisdictions to apply JLUC recommendations to land use decisions in the vicinity of AFP 42. The JLUC report created an additional overflight zone (see Figure 4.7) which identified an area below the most heavily used flight patterns flown at AFP 42, based on the 1990 AICUZ Study. While the JLUC report does include general recommendations consistent with AICUZ planning policy, the overflight zone is not a standard component of an AF AICUZ Study. As a member of the JLUC, the Air Force supported the desires of the local jurisdictions to provide extra measures of protection which they deem necessary.



4.5 Obstructions to Air Navigation (FAR Part 77 Analysis)

The Air Force seeks to protect its airfields from encroachment from construction of facilities whose uses are incompatible with its mission. In addition to the recommendations in Chapter 3, the Air Force is also concerned about development that has the potential to compromise the utility of the airfield if its height or other characteristics (e.g., light emissions, smoke, dust, or steam) is not regulated.

Unlike bases in a coastal plain or prairie areas, terrain elevations around Plant 42 are not uniform; in fact, elevations to the south are significantly higher than the airfield elevation (Figures 4-8, 4-9, 4-10, and 4-11). The elevation above mean sea level (MSL) of the outer horizontal surface is 3,043 feet MSL, based on the established airfield elevation of 2,543 feet MSL. Of note for the jurisdictions south of Plant 42, (Palmdale and Los Angeles County) are that the steeply rising terrain itself penetrates the imaginary surfaces. Structures erected in this area have the potential to adversely affect the current and future mission capability of Plant 42 by impeding the use of instrument approach corridors. These obstacles could cause the aircraft to maintain an altitude that is too high to permit a descent below adverse weather causing a divert to another airfield.

The nearby jurisdictions (cities of Palmdale and Lancaster and Los Angeles County) as well as the State of California should continue to implement land use controls to minimize encroachment from construction of structures whose height and location compromise the utility of the airfield.

To protect aviators and persons on the ground, the FAA evaluates proposals for construction of objects greater than 199 feet above ground level (AGL) or within 20,000 feet of an airport and the object to be constructed would exceed a slope of 100:1 horizontally, (i.e., 100 feet horizontally for each foot vertically) from the nearest point of the nearest runway. Where proposed structures are found to penetrate the Airspace Control Surface Plan (Section 3.2), the FAA and Plant 42 would strongly recommend disapproval of the project to protect pilots during times of adverse weather (low ceilings, poor visibility). Such obstructions can lead to raised minimum altitude for an instrument procedure which can mean the difference between a successful instrument approach to the airfield and a diversion to another base. See Volume II, Appendix D for additional details on how these maximum height recommendations are calculated.

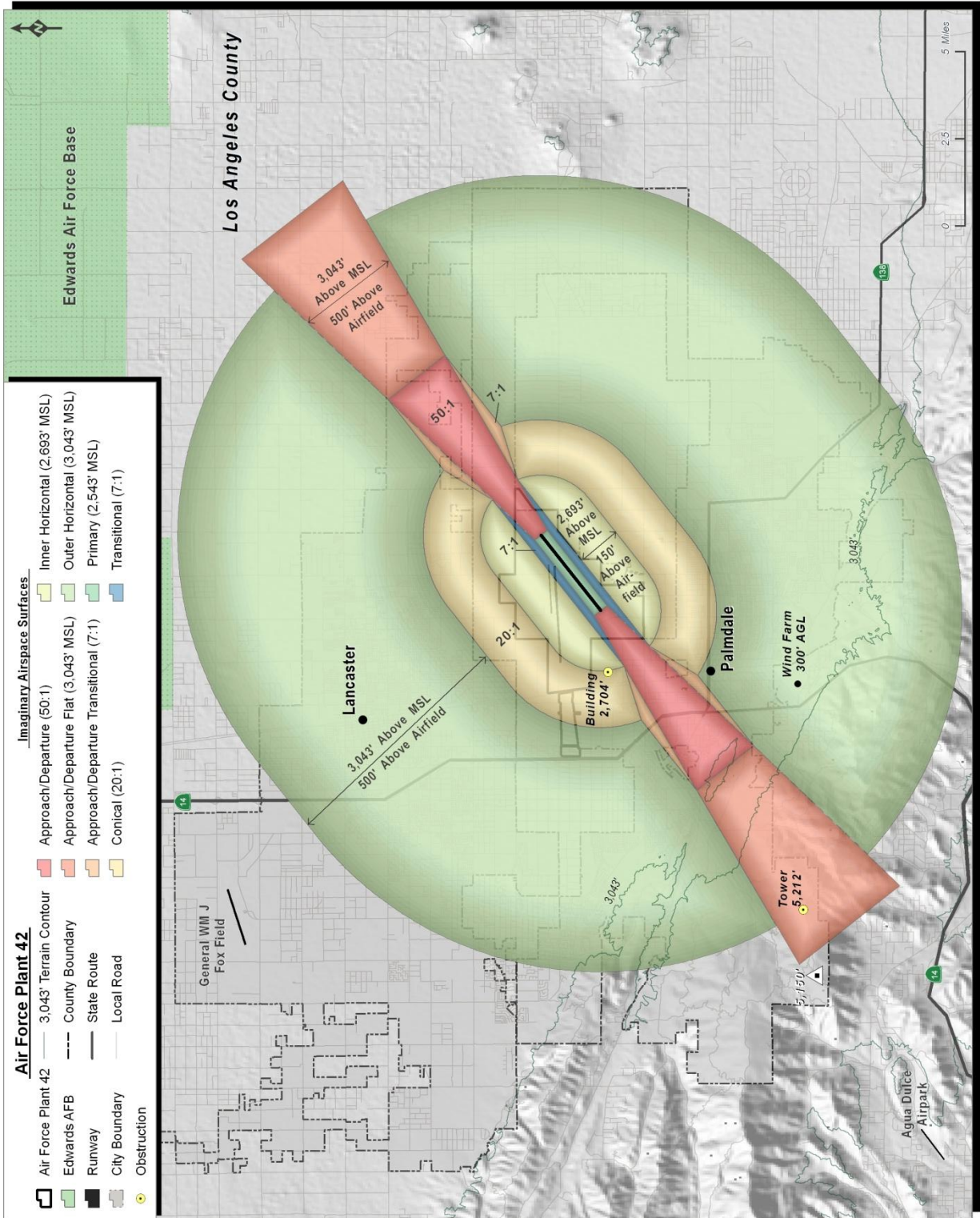


Figure 4-8. Runway 4/22 Imaginary Surfaces

AICUZ AIR FORCE PLANT 42

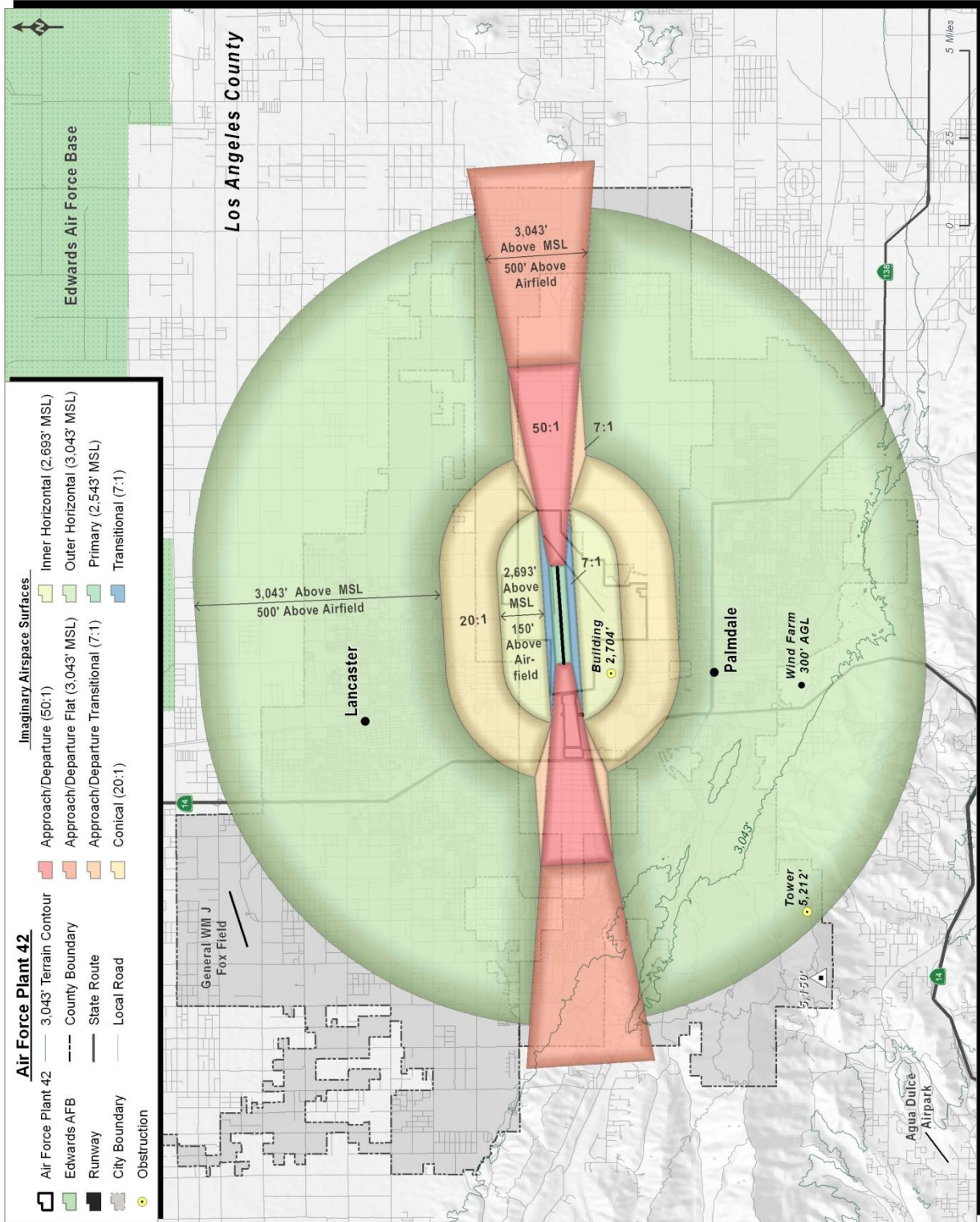
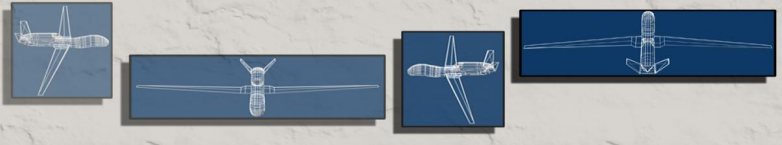


Figure 4-9. Runway 7/25 Imaginary Surfaces

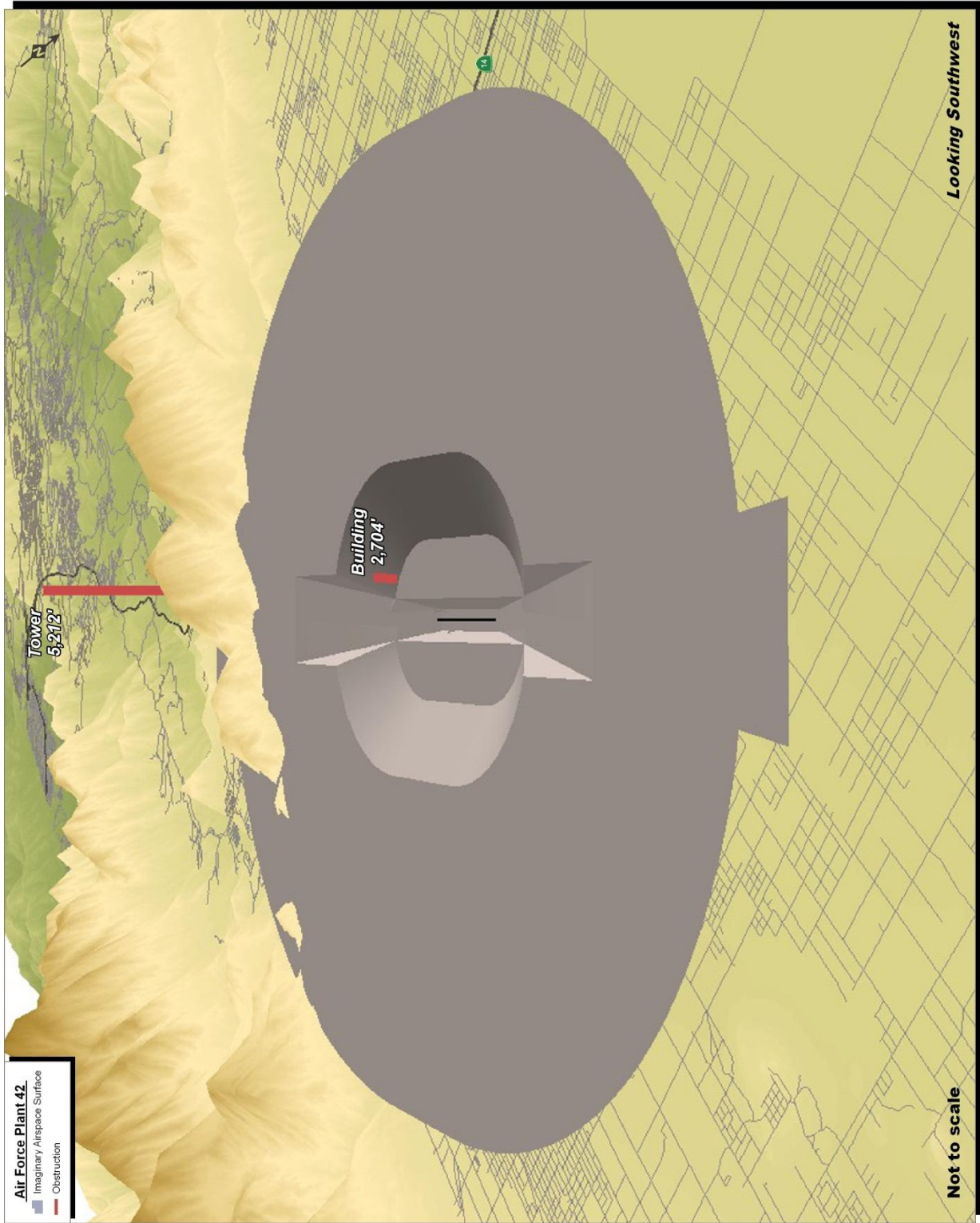


Figure 4-10. Runway 4/22 Imaginary Surfaces (3-Dimensional)

AICUZ AIR FORCE PLANT 42

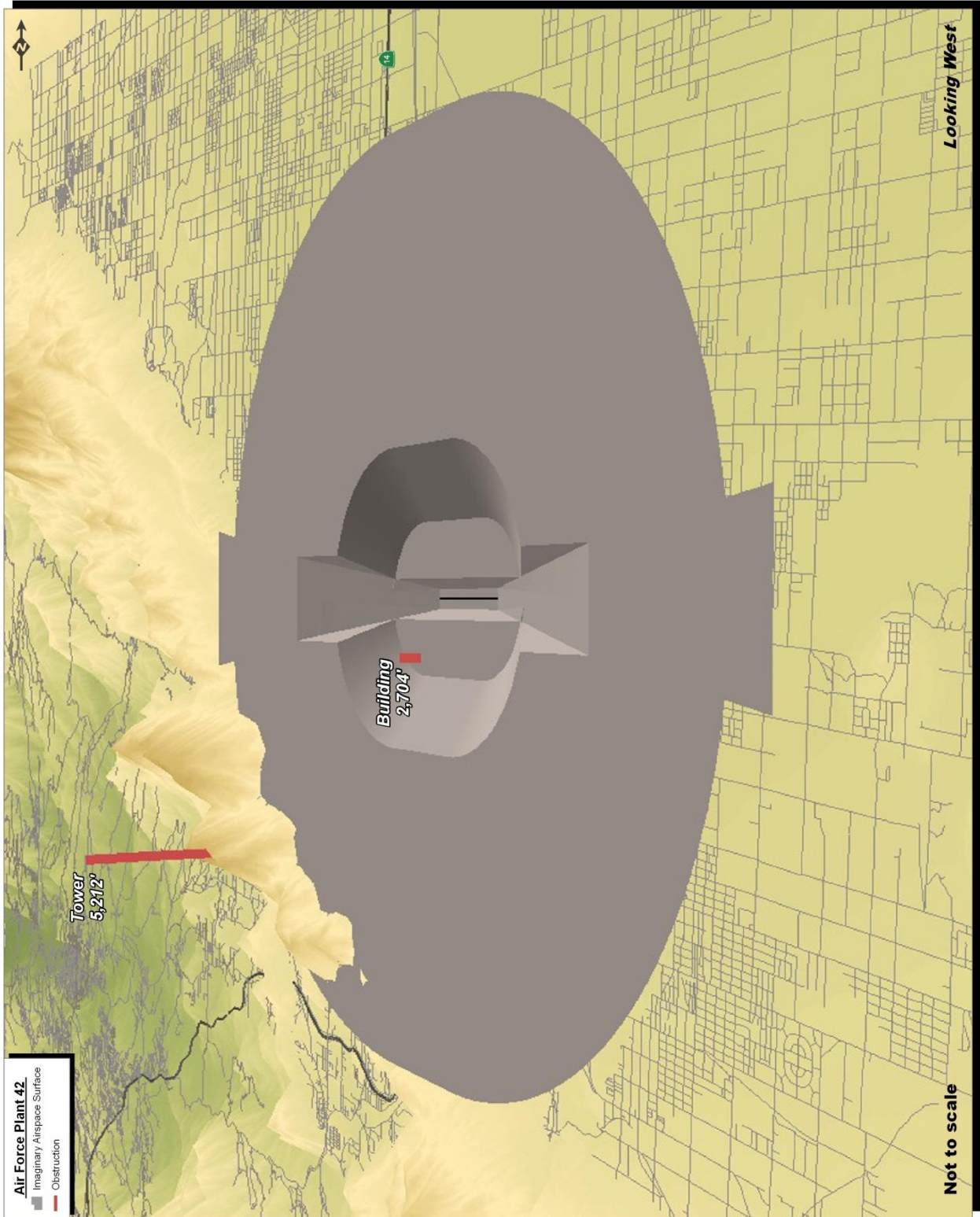
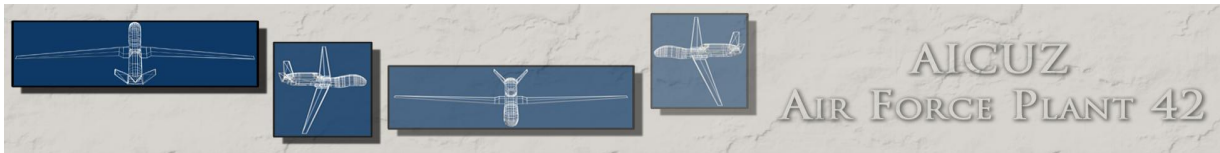


Figure 4-11. Runway 7/25 Imaginary Surfaces (3-Dimensional)

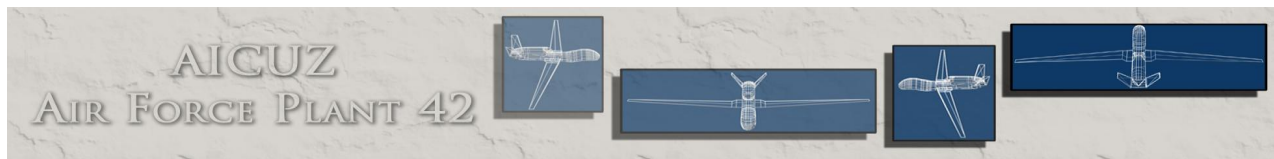


It is also important that the local communities be cognizant of temporary construction activities that might require obstructions, such as tall cranes. These can also affect airfield operations and Plant 42 would request that the surrounding communities contact the installation to determine whether such would have an effect on airfield operations.

As noted in Chapter 3, a weather/fuel divert increases risk to aviators and those on the ground, incurs additional expense in ferrying the aircraft and aircrew when weather improves and consumes additional fuel.

A review of FAA obstruction data indicates that two existing structures penetrate the 14 CFR 77 imaginary surfaces associated with the runways at Plant 42. Both are off the installation. The first is a 109-foot AGL building (2,704 MSL) located adjacent to Plant 42 on Site 10, commonly known as the Lockheed Martin Skunkworks. This structure penetrates the both the 7:1 Conical Transition Surface that connects the Inner Horizontal surface to the Outer Horizontal surface for Runway 4/22 and the Inner Horizontal surface for Runway 7/25. The other obstruction is a 33 foot AGL (5,212 MSL) tower situated on a ridgeline southwest of the airfield in an area where the terrain itself penetrates the imaginary surfaces. In this case, the structure penetrates both the Approach-Departure surface for Runway 4/22 and the Outer Horizontal surface for Runway 7/25. It is unknown when this tower was constructed.

Apart from incompatibilities due to height, the Air Force is concerned that structures not interfere with Air Force communications, navigation, surveillance (CNS), or weather radar facilities. Tall structures, especially when aggregated, may interfere with terrestrial based CNS and weather equipment due to frequency interference, scattering of radar beams, or attenuation of radar returns. In addition, therefore, to the traditional obstruction height analysis performed by the FAA, local communities may wish to require proponents to demonstrate that proposed structures would not compromise the utility of an airfield and the taxpayers' long-standing investment in Plant 42.



4.6 AICUZ Environs

The area of influence for an AICUZ study for which specific land use planning should be undertaken extend beyond the base's immediate neighbors (Figure 4-12).

AICUZ boundaries and noise contours describe the noise exposure of the current operational environment and as such will change over time as operational changes are made. If the local communities that make up the Plant 42 environs attempt to use noise contours alone as boundary lines for zoning districts, it is conceivable that problems will result. Should the mix of aircraft regularly using Plant 42 change, or if the operations intensity were to increase, the noise contours would change.

Additionally, the Air Force is recommending that AICUZ data be utilized with all other planning data. Therefore, specific land use control decisions should not be based solely on AICUZ boundaries. With these thoughts in mind, Plant 42 has revised the 2002 Study and provides flight track and noise contour maps in this report that reflect the most current and accurate picture of aircraft activities.

As the local communities engage in a continuous process of maintaining their comprehensive land use plans, the accompanying implementing ordinances (zoning, subdivision control), and their capital improvement plans for infrastructure and public facility investments, the communities should continue to use sound planning principles. In particular, the Air Force would continue to recommend that planning documents, zoning changes, and similar activities be evaluated against the recommendations contained in Table 3-4 of this document for land use compatibility recommendations.

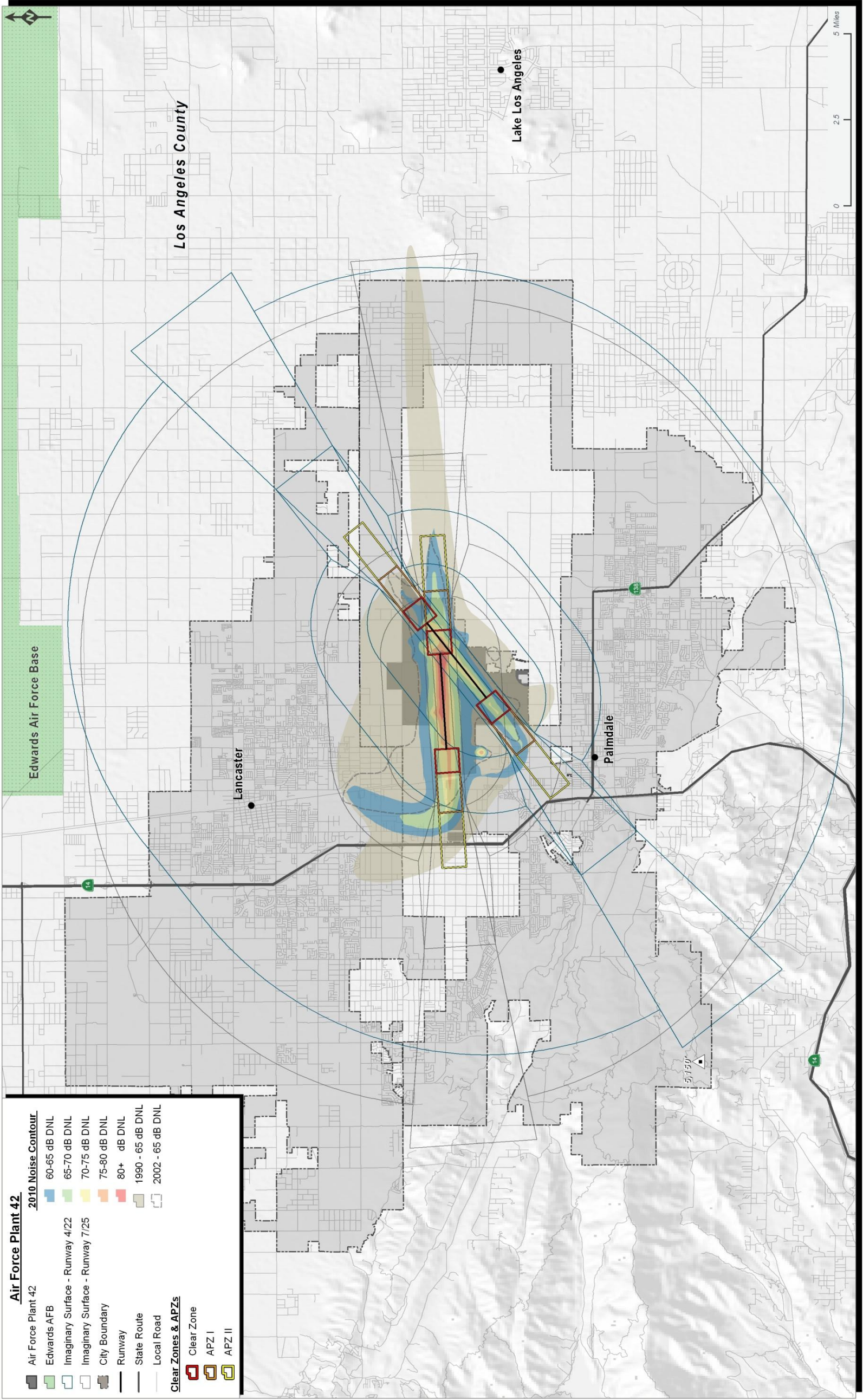
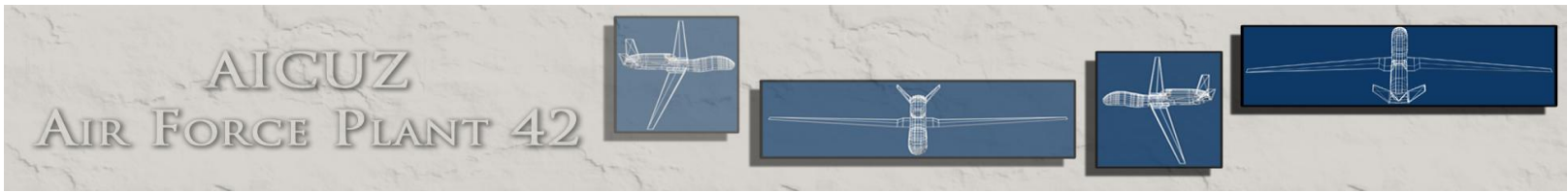
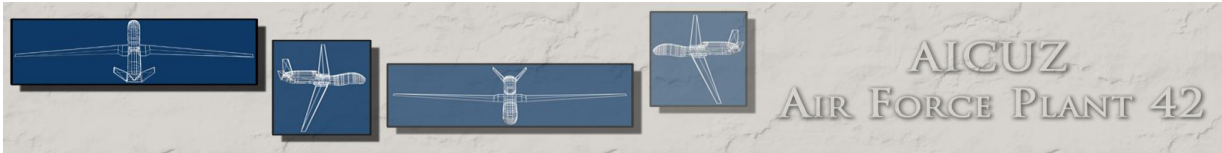


Figure 4-12. AICUZ Environs Map



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4.7 Summary

As noted in the foregoing, Air Force Plant 42 is surrounded by multiple jurisdictions having land use controls to guide development in the region. A review of exiting land use, current zoning, and future land use planning efforts indicate a strong awareness of the mission of Plant 42 and its role in the Greater Antelope Valley.:

Current Land Use:

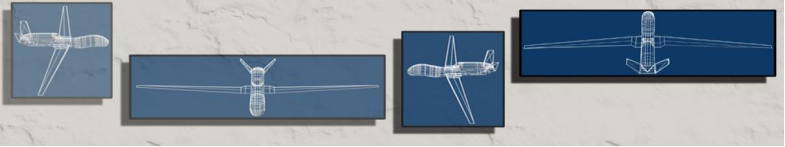
- In general, the vast majority of real estate underlying the noise and accident potential zones are compatible.
- No incompatible land uses with respect to noise were noted.

Current Zoning:

- In general, the jurisdictions zoning ordinances are cognizant of and serve to protect Plant 42 from incompatible development.
- In the City of Palmdale, no incompatible residential zoning exists with respect to noise at current operational levels; however should missions change, areas southwest and west of the installation have residential zoning that may become incompatible.

Future Land Use

- The land use plans of all three jurisdictions contain policy statements recognizing the value of Plant 42 and recommend that development regulations protect the installation from incompatible land uses.
- California has implemented Airport Land Use Committees statewide that review localities planning documents for compatibility with airport operations.
- The ownership of over 17,000 acres adjacent to Plant 42 by LAWA serves as an effective buffer from encroachment by incompatible land uses.
- Noise contours fluctuate over time as seen by comparing the 1990, 2002, and current 2010 contours.
- Navigable airspace is a resource to be protected from encroachment. Future planning efforts should more explicitly incorporate provisions of FAR Part 77, requiring



additional reviews of areas underlying imaginary surfaces as appropriate.

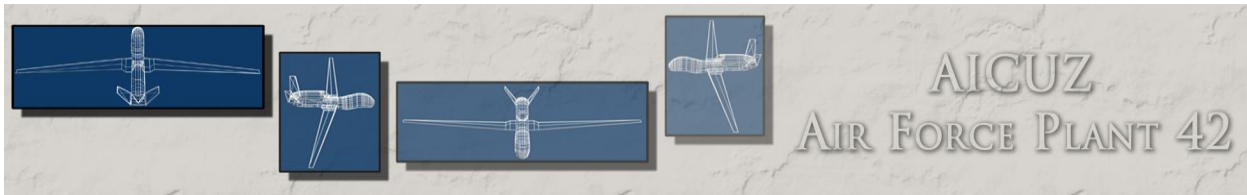
- The continued evolution of technology will require jurisdictions to continuously re-evaluate their land use plans and implementing ordinances. For example, the advances in Unmanned Aerial Vehicles and improvements to solar technology each may have impacts to land use planning efforts requiring further study and analysis.
- New development and population growth in the region are expected to continue, which may give rise to increased pressure to rezone lands around the installation.



AIR FORCE PLANT 42
CALIFORNIA

**CHAPTER 5 •
IMPLEMENTATION**

AIR INSTALLATION COMPATIBLE USE ZONE



5.0 IMPLEMENTATION

The implementation of the AICUZ study must be a joint effort between the Air Force, the cities of Palmdale and Lancaster, the County of Los Angeles, and the State of California. The Air Force's role is to minimize the impact on the local communities caused by Plant 42 operations. The role of the communities is to ensure that development in the base environs is compatible with accepted planning and development principles and practices. To date all parties have done an exceptional job at protecting the flying mission at Plant 42 and in ensuring development of compatible land uses.

5.1 AICUZ Environs

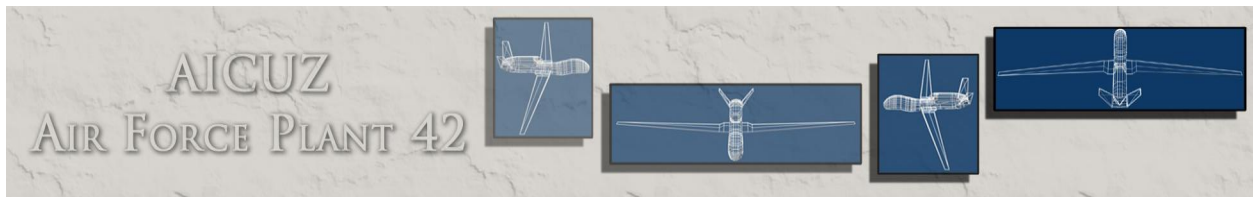
To better assist the community in identifying whether real estate is potentially affected by, or has the potential to affect Air Force flight operations, it is important that all elements of AICUZ, accident potential, noise exposure, and obstruction evaluation and airfield airspace analysis be considered by local authorities when considering potential development. Plant leadership, working in concert with local community leaders and municipal planners will continue to use the information contained within this report as a starting point for inquiry and analysis.

5.2 Air Force Responsibilities

In general, the Air Force perceives its AICUZ responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the land use planning process.

Well-maintained aircraft and well-trained aircrews do much to assure that aircraft accidents are avoided. However, despite the best training of aircrews and maintenance of aircraft, history makes it clear that accidents do occur. It is imperative that flights be routed over sparsely populated areas as much as possible to reduce the exposure of lives and property to a potential accident.

According to Air Force regulations, commanders are required to periodically review existing traffic patterns, instrument approaches, weather minimums, as well as operating practices and evaluate these factors in relationship to populated areas and other local situations. This requirement is a direct result and expression of Air Force policy that all AICUZ plans must include an analysis of flying and flying-related activities that are designed to reduce



and control the effects of such operations on surrounding land areas.

The preparation and presentation of this Plant 42 AICUZ Study is one phase of the continuing Air Force participation in the planning process of local municipalities. As local communities update land use plans, the Air Force must be ready to provide additional inputs.

The AICUZ program represents an ongoing, dynamic process that occurs even after compatible community development plans are adopted and implemented. AFP personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they may affect or may be affected by Plant 42. AFP personnel will also be available to provide information, criteria, and guidelines to state, county and local planning bodies, civic associations, and similar groups. In a spirit of mutual respect and in consideration of our neighbors residing in adjacent communities, the Air Force continuously seeks ways to minimize impacts from flying operations.

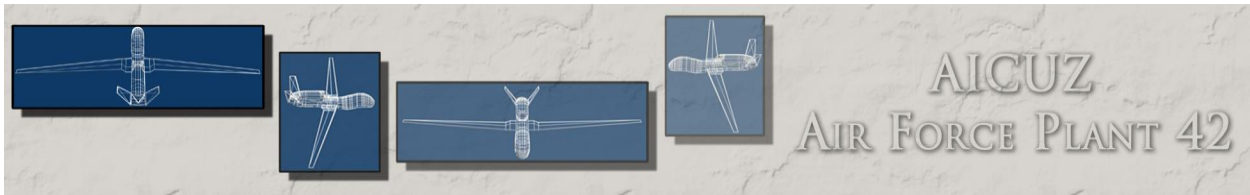
This outreach and other initiatives, while not depicted or represented in the noise model used to develop the contours, do represent ways that the Air Force seeks to minimize noise impacts on its neighbors.

The Air Force participates in working groups with other Federal agencies to proactively prevent encroachment. One technique may include exploring the feasibility of entering into public-private partnerships to conserve land in other high accident potential areas, such as APZs.

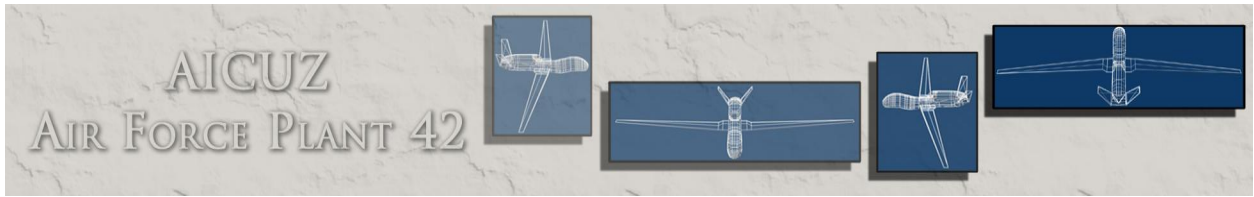
5.3 Local Community Responsibilities

The residents of the local communities and the personnel at AFP 42 have a long history of working together for mutual benefit. The continuation of the following practices will maintain this relationship, increase the health and safety of the public, and help protect the integrity of the base's flying mission:

- Continue to incorporate AICUZ policies and guidelines into future comprehensive plans of the Cities of Palmdale and Lancaster and Los Angeles County. Use overlay maps of the AICUZ noise contours and Air Force Land Use Compatibility Guidelines to evaluate existing and future land use proposals.



- As existing zoning ordinances and subdivision regulations are modified over time, continue to support compatible land uses outlined in this AICUZ study and continue to:
 - recommend against public assembly or high intensity uses in APZ I or II;
 - recommend against residential use in APZ I or II, or in high-noise areas;
 - require a site specific review process for noise-sensitive uses (e.g., schools, hospitals, housing) to assess proposed noise level reduction techniques;
 - discourage noise sensitive development clustered adjacent to but not within a noise zone since contours shift over time and noise does not stop at a noise zone boundary; and
 - provide for specific review recommendation on tall structures in the airfield vicinity.
- Ensure that height and obstruction ordinances reflect current Air Force and FAA FAR Part 77 requirements, and require that project proponents demonstrate their actions will not compromise the utility of the Plant 42 airfield.
- Ensure that future building codes continue to require that new construction within the AICUZ area adheres to the recommended noise level reductions incorporated into the design and construction.
- Continue to inform Plant 42 of planning and zoning actions that have the potential to affect base operations.
- Implement procedures that require project proponents to notify Plant 42 of temporary construction activity which could require the use of cranes within the vicinity of the airfield, in order to allow the installation to analyze impacts on flight operations.



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AIR FORCE PLANT 42
CALIFORNIA

V O L U M E I I

AIR INSTALLATION COMPATIBLE USE ZONE



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APPENDIX A—THE AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES

A.1 Concept

Federal legislation, national sentiment, and other external forces that directly affect the Air Force mission have served to greatly increase the Air Force's role in environmental and planning issues. Problems with airfield encroachment from incompatible land uses surrounding installations, as well as air and water pollution, and socioeconomic impact, require continued and intensified Air Force involvement. The nature of these problems dictates direct Air Force participation in comprehensive community and land use planning. Effective, coordinated planning, that bridges the gap between the Federal Government and the community requires the establishment of good working relationships with local citizens, local planning officials, and state and federal officials. These relationships depend on an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) Program has been developed in an effort to:

- Assist local, regional, state, and federal officials in protecting and promoting public health, safety, and welfare by encouraging compatible development within the AICUZ area of influence
- Protect operational capability of military airfields from the effects of land uses that are incompatible with aircraft operations

The land use guidelines developed herein are a composite of a number of other land use compatibility studies that have been refined to fit the Air Force aviation environment at Plant 42.

A.2 Program

Geo-Marine, Inc. and Weston Solutions, performed this AICUZ Study for Aeronautical Systems Center (ASC) and Air Force Plant 42. Data collection occurred in September and October 2010 at Plant 42, Edwards AFB, and Channel Island ANG Station. Data validation, noise modeling, and land use analysis occurred in the subsequent months.

Installation commanders establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate government agencies and citizens be fully informed whenever AICUZ or other planning matters affecting the installation are under consideration. This includes positive and continuous programs designed to:

- Provide information, criteria, and guidelines to Federal, state, regional, and local planning bodies, civic associations, and similar groups
- Inform such groups of the requirements of the flying activity, noise exposure, aircraft accident potential, and AICUZ plans
- Describe the noise reduction measures being used



- Ensure all reasonable, economical, and practical measures are taken to reduce or control the impact of noise-producing activities. These measures include such considerations as proper location of engine test facilities, provision of sound suppressors where necessary, and adjustment of flight patterns and/or techniques to minimize the noise impact on populated areas. This must be done without jeopardizing safety or operational effectiveness

A.3 Methodology

The AICUZ area of influence consists of land areas upon which certain land uses may obstruct the airspace or otherwise be hazardous to aircraft operations, as well as the land areas that are exposed to the health, safety, or welfare hazards of aircraft operations. The AICUZ concept includes:

- Accident potential zones (APZs) and clear zones (CZs) based on past Air Force aircraft accidents and installation operational data (Appendix B)
- Noise zones (NZs) produced by the computerized day-night average A-weighted sound level (DNL) metric (Appendix C)
- The area designated by the Federal Aviation Administration (FAA) and the Air Force for purposes of height limitations in the approach and departure zones of the base (Appendix D)

The APZs, CZs, and NZs are the basic building blocks for land use planning with AICUZ data. Compatible land uses are specified for these zones, and recommendations on building materials and standards to reduce interior noise levels inside structures are provided in Appendix E.

As a matter of policy, which is based on previous expressions of legislative intent, the Air Force will only seek to control (either by fee-simple ownership or by easement) land uses on that real estate which lying within a CZ. Beyond this area (i.e., noise exposure zones or APZs), compatible land use controls should be achieved through the land use planning process undertaken by municipal authorities.

A.4 AICUZ Land Use Development Policies

The basis for any effective land use control system is the development of, and subsequent adherence to, policies that serve as a uniform standard by which all land use planning and control actions are evaluated. Air Force Plant 42 recommends the following policies be considered for incorporation into the comprehensive plans of agencies in the vicinity of the base.



A.4.1 Policy 1. In order to promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants of airfield area of influence, it is necessary to:

- Guide, control, and regulate future growth and development
- Promote orderly and appropriate land use
- Protect the character and stability of existing compatible land uses
- Prevent the destruction or impairment of the airfield and the public investment therein
- Enhance the quality of living in the affected areas
- Protect the general economic welfare by restricting incompatible land use

A.4.2 Policy 2. In furtherance of Policy 1, it is appropriate to:

- Establish land use compatibility guidelines
- Restrict or prohibit incompatible land use
- Prevent establishment of any land use that would unreasonably endanger aircraft operations and the continued use of the airfield
- Incorporate the AICUZ concept into community land use plans, modifying them when necessary
- Adopt appropriate ordinances to implement airfield area of influence land use plans

A.4.3 Policy 3. Within the boundaries of the AICUZ area of influence, certain land uses are inherently incompatible. The following land uses are not in the public interest and must be restricted or prohibited:

- Uses that release into the air any substance, such as steam, dust, or smoke, which would impair visibility or otherwise interfere with the operation of aircraft
- Uses that produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision
- Uses that produce electrical emissions that would interfere with aircraft communication systems or navigation equipment
- Uses that attract birds or waterfowl, such as operation of sanitary landfills, maintenance or feeding stations, or growth of certain vegetation
- Uses that involve structures constructed to a height that would adversely affect aircraft approach-departure and/or transitional obstacle clearance surfaces



A.4.4 Policy 4. Certain noise levels of varying duration and frequency may adversely affect both physical and mental health. A limited, though definite, danger to life exists in certain areas adjacent to airfields. Where these conditions are sufficiently severe, it is not consistent with public health, safety, and welfare to allow the following land uses:

- Residential
- Retail business
- Office buildings
- Public buildings (schools, churches, etc.)
- Recreation buildings and structures

A.4.5 Policy 5. Land areas below takeoff and final approach flight paths are exposed to significant danger of aircraft accidents. The density of development and intensity of use must be limited in such areas.

A.4.6 Policy 6. Different land uses have different sensitivities to noise. Standards of land use acceptability should be adopted, based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines (Appendix E) for new construction should be implemented to permit certain uses where they would otherwise be prohibited.

A.4.7 Policy 7. Land use planning and zoning in the airfield area of influence cannot be based solely on aircraft-generated effects. Allocation of land used within the AICUZ area of influence should be further refined by consideration of:

- Physiographic factors
- Climate and hydrology
- Vegetation
- Surface geology
- Soil characteristics
- Intrinsic land use capabilities and constraints
- Existing land use
- Land ownership patterns and values
- Economic and social demands
- Cost and availability of public utilities, transportation, and community facilities
- Other noise sources



Each runway end at Plant 42 has a 3,000-foot by 3,000-foot CZ and two APZs. Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. As stated previously, it is Air Force policy to request that Congress authorize and appropriate funds to acquire real property interest in this area to prevent incompatible land uses. At Air Force Plant 42, all of the real estate underlying each CZ is under government ownership. As a result, incompatible land uses are minimized, although not entirely eliminated. The AF also wishes to explore public-private partnerships that would conserve land in other high-accident potential areas, such as the APZs.

Accident Potential Zone I is less critical than the CZ, but still possesses a significant risk factor. This 3,000 foot by 5,000 foot area has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture. However, uses that concentrate people in small areas are not acceptable.

Accident Potential Zone II is less critical than APZ I, but still possesses potential for accidents. For each of the four runway ends (04/22 and 07/25), APZ II is also 3,000 feet wide by 7,000 feet long. It extends to 15,000 feet from the runway threshold. Acceptable uses include those of APZ I, as well as low density single family residential and those personal and business services and commercial/retail trade uses of low intensity or scale of operation. High-density functions such as multistory buildings, places of assembly (theaters, churches, schools, restaurants, etc.), and high-density office uses are not considered appropriate.

Uses having high densities of persons should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most nonresidential usage, buildings should be limited to one story and the lot coverage should not exceed 20%.

A.5 Basic Land Use Compatibility

Research on aircraft accident potential, noise, and land use compatibility is ongoing at a number of Federal and other agencies. One such effort is the Concentrations of Persons per Acre Standard developed by the Sacramento Area Council of Governments for incorporation into the land use planning process. These and all other compatibility guidelines must not be considered inflexible standards. They provide a framework within which land use compatibility questions can be addressed and resolved. In each case, full consideration must be given to local conditions such as:

- Previous community experience with aircraft accidents and noise
- Local building construction and development practices
- Existing noise environment due to other urban or transportation noise sources
- Time period of aircraft operations and land use activities
- Specific site analysis
- Noise buffers, including topography



These basic guidelines cannot resolve all land use compatibility questions. However, they do offer a reasonable framework within which to reconcile competing interests.

A.6 Accident Potential

Land use guidelines for the two APZs are based on a hazard index system that compares the relationship of accident occurrence for five areas:

- On or adjacent to the runway
- Within the CZ
- In APZ I
- In APZ II
- In all other areas within a 10 nautical mile radius of the runway

Accident potential on or adjacent to the runway or within the CZ is so high that few uses would be considered acceptable. The risk outside APZ I and APZ II, but within the 10 nautical mile radius area, is significant but acceptable, if sound engineering and planning practices are followed.

Land use guidelines for APZs I and II have been developed. The main objective has been to restrict all people-intensive uses because there is greater risk in these areas. The basic guidelines aim at prevention of uses that:

- Have high residential density characteristics
- Have high labor intensity
- Involve above-ground explosive, fire, toxic, corrosive, or other hazardous characteristics
- Promote population concentrations
- Involve utilities and services that serve a wide area population, the disruption of which would have an adverse impact (telephone, gas, etc.)
- Concentrate people who are unable to respond to emergency situations, such as children, elderly, handicapped, etc.
- Pose hazards to aircraft operations

There is no question that these guidelines are relative. Ideally, there should be no people-intensive uses in either APZ. The free market and private property rights may or may not prevent this when developable land is in high demand. To disregard these guidelines, however, substantially increases risk by placing more people in areas where there may ultimately be an aircraft accident.



A.7 Noise

Nearly all studies analyzing aircraft noise and residential compatibility recommend no residential uses in noise zones above DNL 75 dB(A). Usually, no restrictions are recommended below noise zone DNL 65 dB(A). Between DNL 65-74 dB(A) there is currently no consensus. These areas may not qualify for Federal mortgage insurance in residential categories according to the Department of Housing and Urban Development (HUD) Regulation 24 CFR 51B. In many cases, HUD approval requires noise attenuation measures, the Regional Administrator's concurrence, and an environmental impact statement. The Department of Veterans Affairs also has airfield noise and accident restrictions that apply to its home loan guarantee program. Whenever possible, residential land use should be located below DNL 65 dB(A) according to Air Force land use recommendations.

Most industrial/manufacturing uses are compatible in the airfield area of influence. Exceptions are uses such as research or scientific activities which require lower noise levels. Noise attenuation measures are recommended for portions of buildings devoted to office use, receiving the public, or where the ordinary background noise level is low.

The transportation, communications, and utilities categories have a high noise level compatibility because they generally are not people-intensive. When people use land for these purposes, the use is generally very short in duration. When buildings are required for these uses, additional evaluation would be warranted.

The commercial/retail trade and personal and business services categories are compatible without restriction up to DNL 70 dB(A); however, they are generally incompatible above DNL 80 dB(A). Between DNL 70-80 dB(A), noise level reduction measures should be included in the design and construction of buildings.

The nature of most uses in the public and quasi-public services category requires a quieter environment, and attempts should be made to locate these uses in areas having a DNL of less than 65 dB(A) (an Air Force land use recommendation), or else provide adequate noise level reduction in the design of the facility.

Although recreational use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above DNL 75 dB(A), noise becomes a factor that limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (i.e., music shell, etc.), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

With the exception of forestry activities and livestock farming, uses in the resources production, extraction, and open space category are compatible almost without restrictions.



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APPENDIX B—CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

B.1 Guidelines for Accident Potential

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircraft crews. Despite stringent maintenance requirements and countless hours of training, history shows accidents do happen.

When the AICUZ Program began, there were no current comprehensive studies on accident potential. To support the program, the Air Force completed a study in 1973 of Air Force aircraft accidents that occurred between 1968 and 1972 within 10 nautical miles of airfields. The study of 369 accidents indicated that 75 percent of aircraft accidents occurred on or adjacent to the runway (1,000 feet to each side of the runway centerline) and in a corridor 3,000 feet (1,500 feet either side of the runway centerline) wide, extending from the runway threshold along the extended runway centerline for a distance of 15,000 feet.

Three zones were established based on these crash patterns: the CZ, APZ I, and APZ II. The CZ starts at the end of the runway and extends outward 3,000 feet. It has the highest accident potential of the three zones. The Air Force has adopted a policy of acquiring property rights to areas designated as CZs because of their high accident potential. APZ I extends out from the CZ an additional 5,000 feet along the extended runway centerline compared to the CZ, it is an area of reduced accident potential. APZ II extends from APZ I an additional 7,000 feet; it is an area of still further diminished accident potential.

The Air Force's research work in accident potential was the first significant effort in this subject area since 1952 when the President's Airport Commission published *The Airport and Its Neighbors*, better known as the "Doolittle Report." The recommendations of this earlier report were influential in the formulation of the APZ concept.

The risk to people on the ground of being killed or injured by aircraft accidents is small. However, in terms of risk assessment, an aircraft accident is a high consequence event because when a crash does occur, the result is often catastrophic. Therefore, the Air Force does not attempt to base its safety standards solely on accident probabilities. Instead, the Air Force approaches this safety issue from a land use planning perspective.

B.2 Accident Potential Analysis

Military aircraft accidents differ from commercial air carrier and general aviation accidents because of the variety of aircraft used, the type of missions to which they are put, and the high number of training and proficiency flights.



The 1973 study reviewed 369 major Air Force accidents occurring between 1968 and 1972, and found that 61 percent of the accidents were related to landing operations and 39 percent were takeoff related. It also found that 70 percent occurred in daylight, and that fighter and training aircraft accounted for 80 percent of the accidents.

Because the purpose of the study was to identify accident hazards, the study plotted each of the 369 accidents in relation to the airfield. This plotting found that the accidents clustered along the axis of runway and its extended centerline. To further refine this clustering, a tabulation was prepared that described the cumulative frequency of accidents as a function of distance from the runway centerline along the extended centerline. This analysis was done for widths of 2,000, 3,000, and 4,000 total feet. Table B-1 reflects the location analysis.

Table B-1. Analysis of Location of Air Force Airfield Accidents.

| Length From Both Ends of Runway (feet) | Width of Runway Extension ¹ (Feet) | | |
|---|--|-------|-------|
| | 2,000 | 3,000 | 4,000 |
| Percent of Accidents | | | |
| On or Adjacent to Runway (1,000 feet to each side of runway centerline) | 23 | 23 | 23 |
| 0 to 3,000 | 35 | 39 | 39 |
| 3,000 to 8,000 | 8 | 8 | 8 |
| 8,000 to 15,000 | 5 | 5 | 7 |
| Cumulative Percent of Accidents | | | |
| On or Adjacent to Runway (1,000 feet to each side of runway centerline) | 23 | 23 | 23 |
| 0 to 3,000 | 58 | 62 | 62 |
| 3,000 to 8,000 | 66 | 70 | 70 |
| 8,000 to 15,000 | 71 | 75 | 77 |

1. The runway centerline is the midpoint for the widths

Figure B-1 indicates the cumulative number of accidents rises rapidly from the end of the runway to 3,000 feet, rises more gradually to 8,000 feet, then continues at about the same rate of increase to 15,000 feet, where it levels off rapidly. The location analysis also indicates 3,000 feet as the optimal runway protection area width, and captures within it the maximum percentage of accidents in the smallest area.

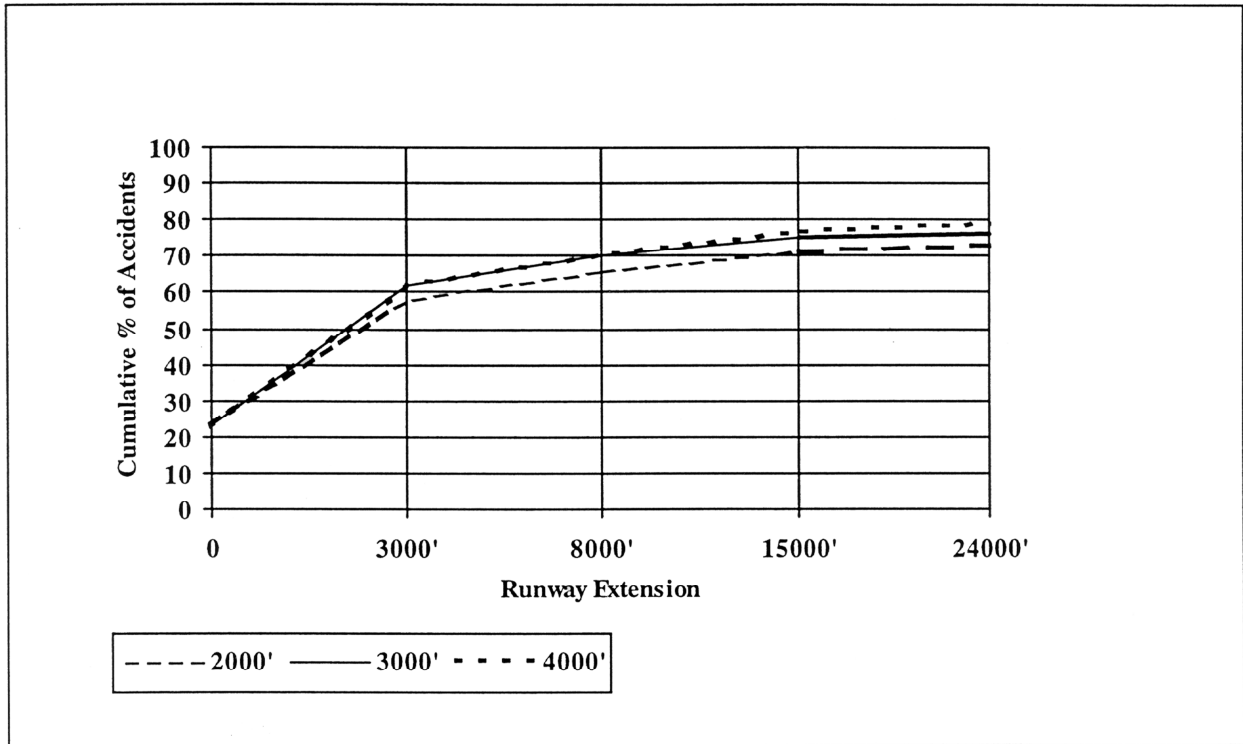


Figure B-1. Distribution of Air Force Aircraft Accidents (369 Accidents—1968-1972).

Using the optimal runway protection width, 3,000 feet, and the cumulative distribution of accidents from the end of the runway, zones were established that minimized the land area included and maximized the percentage of accidents included. The zone dimensions and accident statistics for the 1968-1972 study are shown in Figure B-2.



Other Accidents within 10 Nautical Miles: 94 Accidents, 25.4%

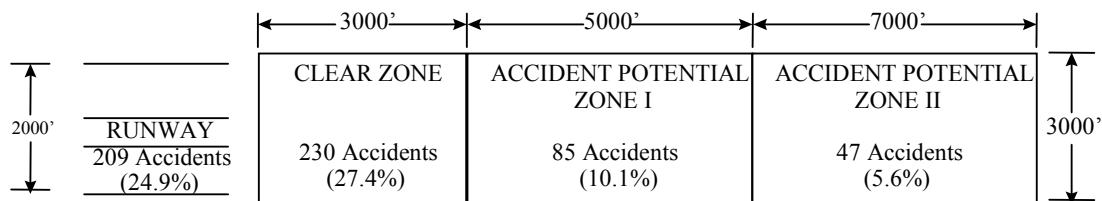
Figure B-2. Air Force Aircraft Accident Data (369 Accidents—1968-1972).



Additional accident data for 1986 through 1995 have been analyzed. Table B-2 compares the accident distribution data for 1968-1985 with that for 1968-1995, and Figure B-3 depicts the results for a total of 838 accidents. Analysis shows the cumulative changes evident in accident location through 1995 reconfirm the optimal dimensions of the CZ and APZs.

Table B-2. Additional Accident Data (838 Accidents - 1968-1995).

| ZONE | 1968-1985 | 1968-1995 |
|-----------------------|--------------|--------------|
| On-Runway | 197 (27.1 %) | 209 (25.1 %) |
| CZ | 210 (28.8 %) | 226 (27.1 %) |
| APZ I | 57 (7.8 %) | 85 (10.2 %) |
| APZ II | 36 (5.0 %) | 47 (5.6 %) |
| Other (Within Ten NM) | 228 (31.3 %) | 267 (32.0 %) |



Other Accidents within 10 Nautical Miles: 267 Accidents, 32.0%

Figure B-3. Air Force Aircraft Accident Data (838 Accidents - 1968-1995).

B.3 Definable Debris Impact Areas

The Air Force also determined which accidents had definable debris impact areas, and in what phase of flight the accident occurred. Overall, 75 percent of the accidents had definable debris impact areas, although they varied in size by type of accident.

The Air Force used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas:

- Overall Average Impact Area 5.06 acres
- Fighter, Trainer, and Misc. Aircraft 2.73 acres
- Heavy Bomber and Tanker Aircraft 8.73 acres



B.4 Findings

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

Air Force accident studies have found that aircraft accidents near Air Force installations occurred in the following patterns:

- 61% were related to landing operations;
- 39% were related to takeoff operations;
- 70% occurred in daylight;
- 80% were related to fighter and training aircraft operations;
- 25% occurred on the runway or within an area extending 1,000 feet out from each side of the runway;
- 27% occurred in an area extending from the end of the runway to 3,000 feet along the extended centerline and 3,000 feet wide, centered on the extended centerline; and
- 16% occurred in an area between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline.

The Air Force aircraft accident statistics found that 75% of aircraft accidents resulted in definable impact areas. The size of the impact areas were:

- 5.1 acres overall average;
- 2.7 acres for fighters and trainers; and
- 8.7 acres for heavy bombers and tankers.



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APPENDIX C—DESCRIPTION OF THE NOISE ENVIRONMENT

C.1 Noise Contours

The following paragraphs describe the methodologies used to produce the noise contours contained in this AICUZ Study.

C.2 Noise Environment Descriptor

The noise contour methodology used is the day-night average A-weighted sound level (DNL) metric expressed in decibels (dB[A]) for describing the noise environment. Efforts to provide a national uniform standard for noise assessment have resulted in adoption by the Environmental Protection Agency of DNL as the standard noise prediction metric for this procedure. The Air Force uses the DNL descriptor as the method to assess the amount of exposure to aircraft noise and predict community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80+ dB(A). Land use guidelines are based on the compatibility of various land uses with these noise exposure levels. DNL is a measurable quantity that can be measured directly.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. DNL begins with a single event descriptor and adjusts it for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor, plus corrections for number of flights and time of day (Figure C-1).

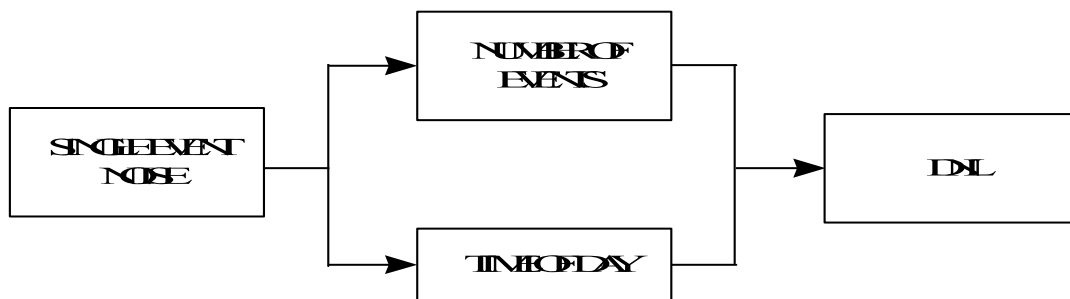


Figure C-1. Day-Night Average A-Weighted Sound Level (DNL).



As part of the extensive data collection process, detailed information is gathered on the type of aircraft and number and time of day of flying operations for each aircraft flight track during a typical day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. These values are calculated at points on grid over an area of interest. Points having an equal value are connected to form the contour lines.

C.3 Noise Event Descriptor

The single event noise descriptor used in the DNL system is the sound exposure level (SEL). The SEL measure is an integration of an “A-weighted” noise level over the period of a single event, such as an aircraft overflight, in dB(A). Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft/engines at different power settings and phases of flight.

SEL vs. slant range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek, and Newman, Inc., in conjunction with the Air Force's Armstrong Laboratory (AL), and carried out by AL. These standard day sea level values form the basis for the individual event noise descriptors at any location and these are then adjusted for a particular location by applying appropriate corrections for temperature, humidity, and variations from standard profiles and power settings (Figure C-2).

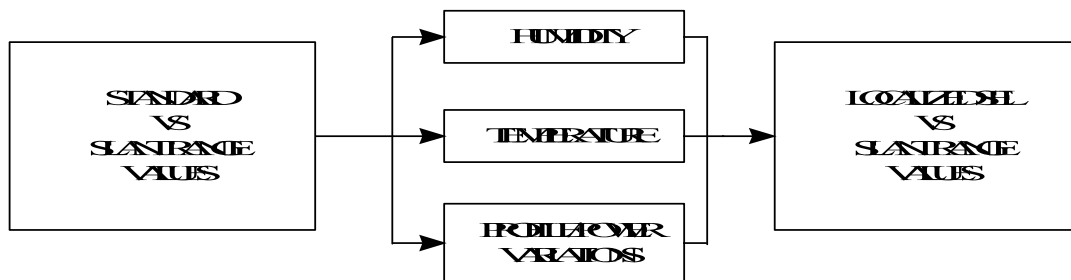


Figure C-2. Sound Exposure Level (SEL).

Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet above ground level, with linear transition from ground-to-ground sound propagation characteristics occurring between 500 and 700 feet, and air-to-ground propagation characteristics are employed above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates noise resulting from engine/aircraft maintenance checks on the ground. Data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a typical day, power settings used and their duration, and use of suppression devices are collected for each ground run up or test



position. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce noise contours reflecting the overall noise environment with respect to aircraft air and ground operations.

C.4 Noise Contour Production

Data describing flight track distances and turns, altitudes, airspeeds, power settings, flight track operational utilization, maintenance locations, ground runup engine power settings, and number and duration of runs by type of aircraft/engine were assembled for Plant 42. Flight track maps were generated for verification and approval by Plant 42 and AFCEE. After any required changes were incorporated, DNL contours were generated by the computer using the supplied data and standard source noise data corrected to local weather conditions. A set of these contours is provided in the body of the AICUZ Study.

Additional technical information on the DNL procedures is available in the following publications:

- *Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure*, AMRL-TR-73-105, November 1974, from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia, 22151.
- *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety*, EPA Report 550/9-74-004, March 1974, from Superintendent of Documents, US Government Printing Office, Washington, D.C., 20402.



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APPENDIX D HEIGHT AND OBSTRUCTIONS CRITERIA

D.1 Height and Obstructions Criteria

D.1.1 General

This appendix outlines criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are considered to be:

- Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs, and/or
- Man-made objects that extend more than 500 feet above the ground at the site of the structure

D.1.2 Explanation of Terms

The following will apply (Figures D-1, D-2, D-3):

- Runway Classification. Both runways at Air Force Plant 42 are Class B runways intended for heavy cargo and jet fighter aircraft
- Controlling Elevation. When surfaces or planes within the obstructions criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane
- Runway Length. Plant 42 has two runways designed and built for sustained aircraft landings and take offs. Runway 04/22 is 12,001 feet long by 150 feet wide, and Runway 07/25 is 12,002 feet long by 200 feet wide
- Established Airfield Elevation. The established field elevation for Plant 42 is 2,543 MSL
- Dimensions. All dimensions are measured horizontally unless otherwise noted

D.1.3 Planes and Surfaces.

The *Unified Facilities Criteria 3-260-01, Airfield and Heliport Planning and Design*, the DoD implementing instruction for Federal Aviation Regulations (FAR) Part 77 obstruction evaluation/airport airspace analysis (OE/AAA) outlines the dimensions the different types of imaginary surfaces associated with a Class B runway.

Definitions are as follows:



- **Primary Surface.** This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area. The primary surface comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway ends. The width of the primary surface for a single class “B” runway, the class for Plant 42’s runways (04/22 and 07/25), is 2,000 feet, or 1,000 feet on each side of the runway centerline. Ideally, there should be no obstructions, fixed or mobile, within the primary surface area.
- **Clear Zone Surface.** This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface. The CZ surface length and width (for a single runway) is 3,000 feet by 3,000 feet.
- **Approach-Departure Clearance Surface.** This surface is symmetrical about the extended runway centerline, begins as an inclined plane (glide angle) at each end of the primary surface of the centerline elevation of the runway end, and extends for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline 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 start of the glide angle. The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.
- **Inner Horizontal Surface.** This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation. It is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.
- **Conical Surface.** This is an inclined 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.
- **Outer Horizontal Surface.** This surface is a plane located 500 feet above the established airfield elevation. It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.
- **Transitional Surfaces.** These surfaces connect the primary surfaces, CZ surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline. To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the clear zone, draw a line from this point to the runway centerline. This line will be at right angles to the runway axis. The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

The land areas outlined by these criteria should be regulated to prevent uses that might otherwise be hazardous to aircraft operations.

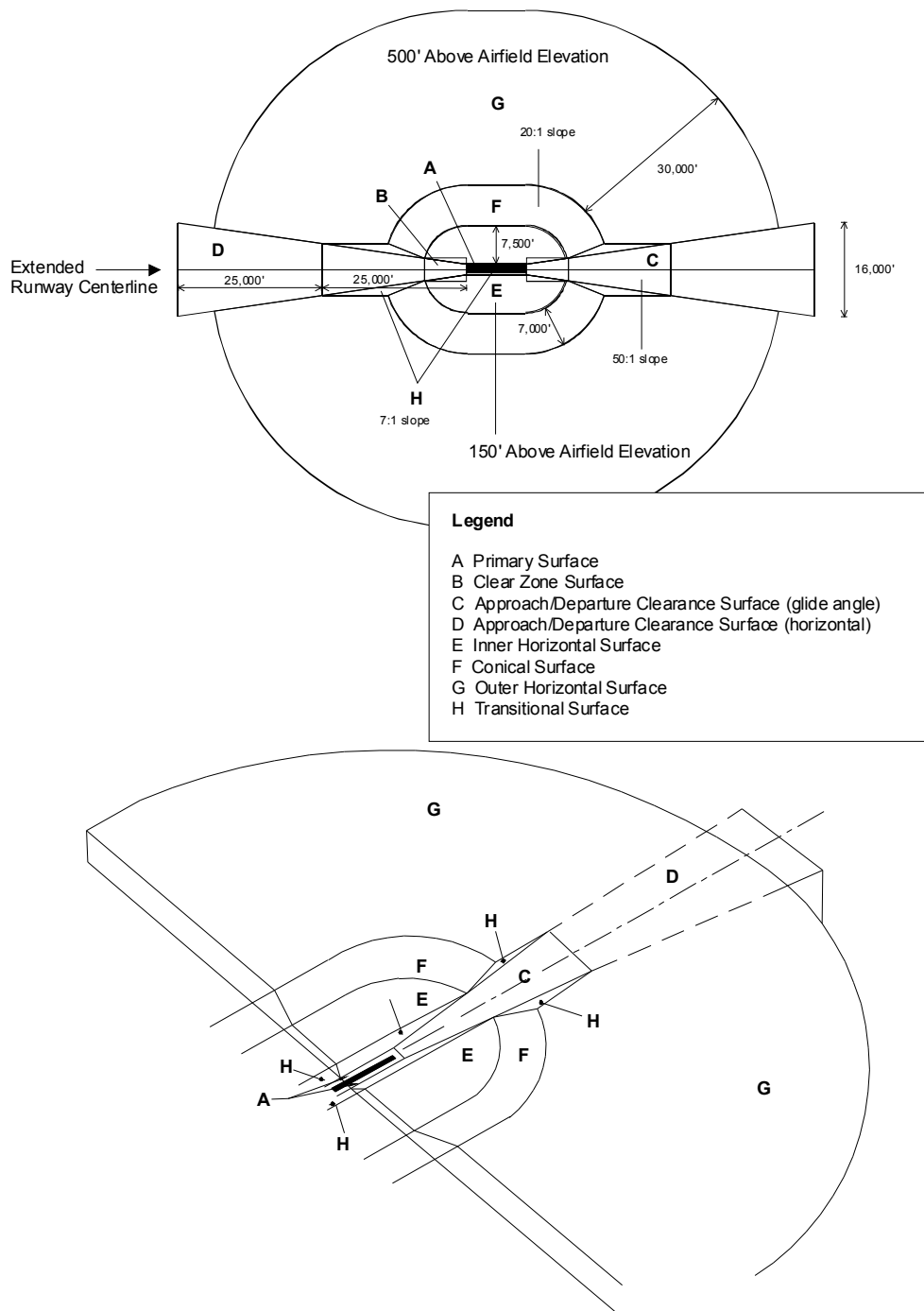
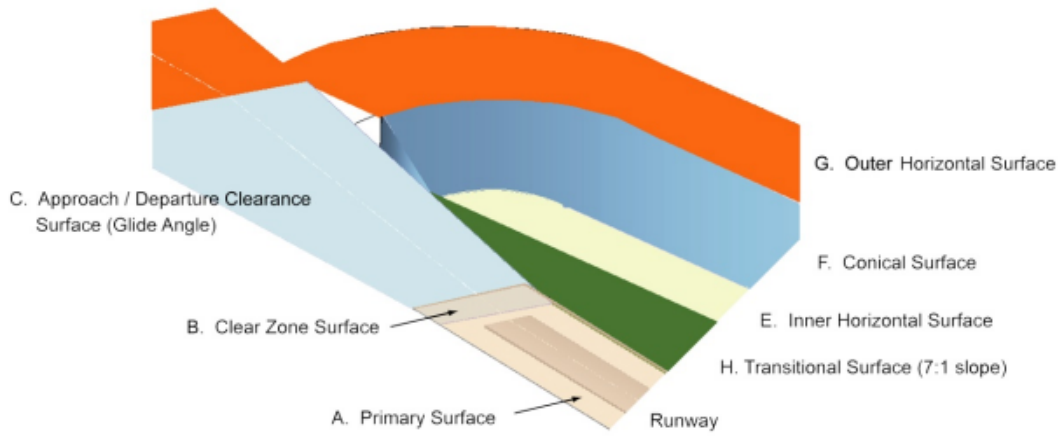


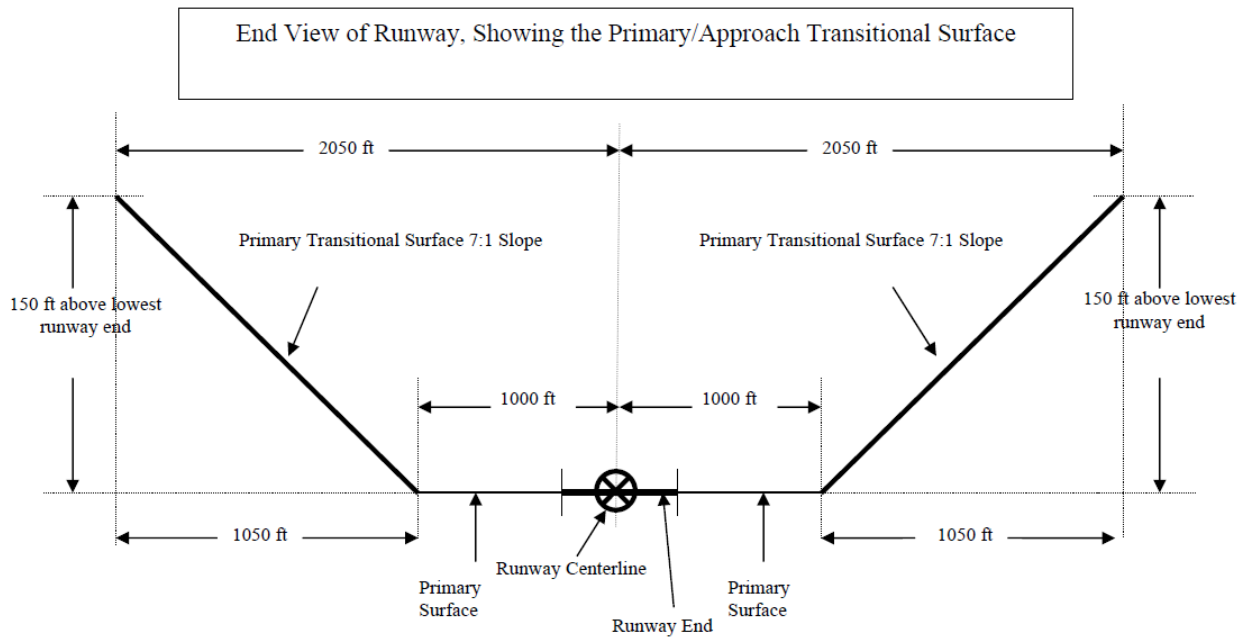
Figure D-1. Airspace Control Surface Plan¹.

1. For a more complete description of airspace control surfaces, refer to FAR Part 77, Subpart C, or Unified Facilities Criteria (UFC) 3-260-01, *Airfield and Heliport Planning and Design*.



Not to Scale

Figure D-2. Three-Dimensional View of FAR Part 77 and UFC Imaginary Surfaces.



Source: Natural Geospatial-Intelligence Agency, Airfield Initiative Document, 24 April 2001

Figure D-3. Cross-Section View of FAR Part 77 Imaginary Surfaces.



D.2 Other Hazards to Air Navigation

The following uses should also be restricted and/or prohibited.

- Uses that release into the air any substance that would impair visibility or otherwise interfere with the operation of aircraft (i.e., steam, dust, or smoke)
- Uses that produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision
- Uses that produce electrical emissions that would interfere with aircraft communications systems or navigational equipment
- Uses that would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, or the growing of certain vegetation
- Uses that include structures within ten feet of aircraft approach-departure and/or transitional surfaces

D.3 Height Restrictions

City and county agencies involved with approvals of permits for construction should require developers to submit calculations that show projects meet the height restriction criteria of FAR Part 77, *Objects Affecting Navigable Airspace*, Subpart C (Obstruction Standards), as described in part by the information contained in this Appendix (Table D-1).

Table D-1. Plant 42 Coordinates and Elevations.

| | | |
|--------------------|-----------|--|
| Airport Elevation: | | 2,543 feet (MSL) |
| Coordinates: | Runway 04 | Lat. 34° 37.014033N Long. 118° 05.496700W |
| | Runway 22 | Lat. 34° 38.23726N Long. 118° 03.616100W |
| | Runway 07 | Lat. 34° 37.835100N Long. 118° 06.78381W |
| | Runway 25 | Lat. 34° 37.96651N Long. 118° 04.39571W |



The area of concern for which all OE/AAA should be performed is shown in the main body of this report. Additionally, outside of this area, proposed structures over 500' above ground level at the site should be evaluated.



APPENDIX E—NOISE LEVEL REDUCTION GUIDELINES

A study providing in-depth, state-of-the-art noise level reduction guidelines, was completed for the Naval Facilities Engineering Command and the Federal Aviation Administration, by Wyle Laboratories in April 2005. The study title is *Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations*. Copies of this study are available for review, upon request, from the office of the Airfield Management at Air Force Plant 42.



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