Cibecue Airport Master Plan

Draft Feasibility Study

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airport engineering and planning services

Cibecue Airport Master Plan
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Introduction and Airport History

Cibecue Airport (Z95) is a general aviation airport located on the Fort Apache Reservation in eastern Arizona, approximately two miles south of the Town of Cibecue and approximately 48 miles northwest of Whiteriver, Arizona. The Town of Cibecue is located on the western side of the reservation and is accessed by Bureau of Indian Affairs (BIA) Route 12 off of US Highway 60. The airport is owned and operated by the White Mountain Apache Tribe. An Environmental Assessment and Site Selection Study were completed in March of 1996 by the BIA, Fort Apache Agency, to identify the most adequate site for an airport for air tanker operations used for fire identification and suppression on the western side of the reservation. Initial construction on the airport began in the fall of 1996 and was completed in the summer of 1997.

Figure 1. Cibecue Airport

Purpose

A typical airport-planning document describes and depicts the overall concept for the long-term development of an airport. It presents the concepts graphically in the airport layout plan (ALP) drawing set and reports the data and logic on which the concept is based in the airport master plan (AMP) report. This plan will first determine the long-term development concept for the Cibecue Airport and then determine the feasibility of improving the existing Cibecue Airport to meet that long-term development concept. If the existing Cibecue Airport site is determined to be feasible, a detailed set of airport layout plans will be developed for the airport. If the existing Cibecue Airport site is determined not feasible, a site selection study will commence. Once a feasible site is selected, a detailed set of airport layout plans will then be developed for that site. The goal of this planning process is to provide guidelines for future airport development that will satisfy aviation demand in a financially feasible manner, while at the same time resolving the aviation, environmental, and socioeconomic issues in the community with respect to the airport.

Objectives

The primary objective of this plan is to determine the feasibility of improving the existing Cibecue Airport site to meet the needs and objectives of the White Mountain Apache Tribe. The secondary objective is to develop a detailed set of airport layout plans showing existing, future and ultimate configurations for the airport. This plan serves as a guide to decision makers, airport users, and the general public for implementing airport development actions in line with both airport and community concerns and objectives.

Specific objectives of the plan include, but are not limited to:

- Clearly identify the present and future roles of the Cibecue Airport;
- Identify the infrastructure needs and Airport Reference Code (ARC) for the airport;
- Provide the basis for future federal, state, local government and private investment in the airport;
- Determine an adequate site for airport development;
- Evaluate development which will enhance the airport's capacity to meet the goals of the Tribe and the BIA;
- Identify future land allocation requirements;
- Identify and consider potential environmental impacts; and
- Develop a fiscally sound and realistic financial plan for owners and users.

In order to accomplish these objectives, this plan will:

- Inventory and analyze data pertinent to the airport;
- Analyze the socioeconomic data of the Tribe, Town of Cibecue, and Navajo County;
- Evaluate factors influencing aviation activity in the area;
- Forecast aviation activity for the 20 year planning period;
- Determine the existing and future facility requirements of the Cibecue Airport;
- Determine the feasibility of providing these facilities at the existing airport;
- If necessary, identify and evaluate alternative sites for airport development;
- Develop airport layout plans in accordance with the current FAA regional ALP checklist;
- Develop schedules of proposed development and estimate development costs;
- Estimate annual operations and maintenance costs and develop a financial plan for the airport;
- Develop Compatible Land Use and Height Restriction overlay zoning for the Airport Influence Area.

AIRPORT PLANNING PROCESS

Airport planning takes place at the national, state, regional, and local levels. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning. The National Plan of Integrated Airport Systems (NPIAS) is a ten-year plan continually updated and published biennially by the Federal Aviation Administration (FAA). This publication lists developments at public use airports considered to be of national interest and thus eligible for financial assistance for airport planning and development under the Airport and Airway Improvement Act of 1982.

Statewide Integrated Airport Systems Planning identifies the general location and characteristics of new airports and the general expansion needs of existing airports to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies. Regional Integrated Airport Systems planning identifies airport needs for a large regional or metropolitan area. Needs are stated in general terms and incorporated into statewide system plans. Airport Master Plans are prepared by the operators of individual airports and are usually completed with the assistance of consultants.

A technical advisory committee has been established to assist with the development of this plan. The Cibecue Airport Technical Advisory Committee (ATAC) consists of members representing varied interests in the Cibecue Airport. Their involvement throughout the planning process will help to keep interested parties informed and will foster consensus for future development actions. Current members include:

ATAC REPRESENTATIVES

- *White Mountain Apache Tribe, Tribal Engineer – John Bereman*
- *Bureau of Indian Affairs, Fire Management Officer – George Leech*
- *Indian Health Service, Cibecue Clinic, Chief Nurse – Mark Wessel*

Chapter One
Inventory

Cibecue Airport Master Plan

Chapter One
Airport Inventory

INTRODUCTION

The Cibecue Airport is currently utilized for fire fighting operations, aerial reseeding, air medivac, as well as business and recreational flights. The existing (unimproved) condition of the airport has resulted in aircraft damage and has led to the need to improve (pave) the runway. This study was initiated to document the needed improvements and determine the ability of the existing site to accommodate long-term airport operations.

The information in this chapter was obtained through on-site inspections of the airport facilities, interviews with Tribal and Bureau of Indian Affairs (BIA) Fort Apache Agency officials, and review of the Federal Aviation Administration (FAA) Airport Master Record and Terminal Area Forecasts (TAF). Information was also obtained from historical records of airport development and operations, including the 1996 Bureau of Indian Affairs Environmental Assessment and Site Selection Study.

AIRPORT LOCATION

Cibecue Airport is located on the western side of the Fort Apache Reservation, approximately three miles south of the Town of Cibecue. The airport is accessed by BIA Route 12 off of US Highway 60. The location of the Town of Cibecue on the reservation is illustrated in Figure 1-1. The northern boundary of the Fort Apache Reservation is shown in brown in Figure 1-1.

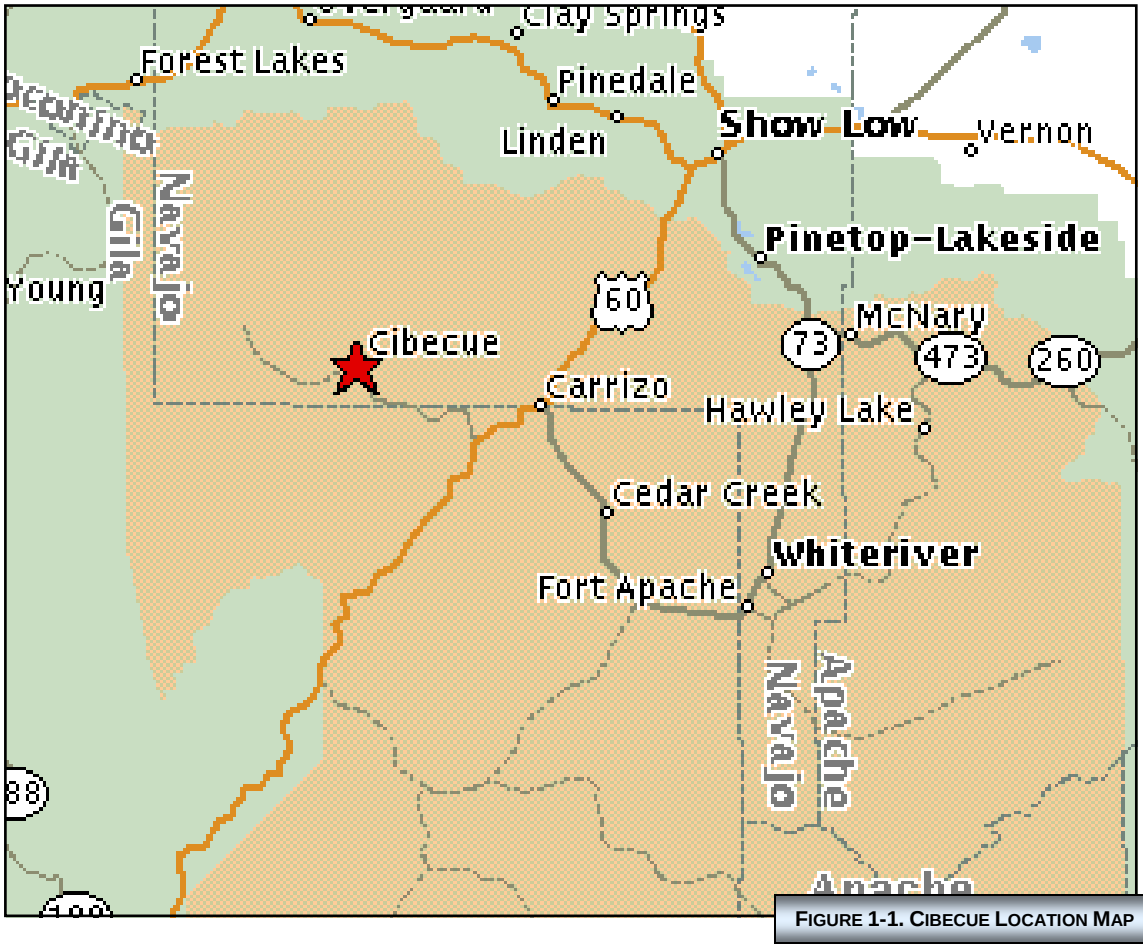


FIGURE 1-1. CIBECUE LOCATION MAP

The Cibecue Airport is surrounded by mostly undeveloped land used primarily for Tribal cattle grazing. At an elevation of approximately 5,000 feet, the climate in the area ranges from an average high of 91.3 degrees Fahrenheit in July to an average low of 21.9 degrees in January.

AIRPORT PROPERTY

The airport is located in Navajo County, Arizona, partially in the east half of Section 17, and partially in the west half of Section 16 of Township 7 North, Range 18 East. The existing airport property line encompasses approximately 163 acres according to the airport legal description. All land on the Fort Apache Reservation is owned and controlled by the Tribe. The 163 acres of airport land have been designated by the Tribe for aeronautical use.

LAND USE PLANNING

The Cibecue Airport is located on the For Apache Reservation and all land is owned and controlled by the White Mountain Apache Tribe. This reduces the risk of incompatible land uses in the vicinity of the airport, however, the airport sponsor should still implement a compatible land use zoning ordinance for the airport.

REGIONAL SETTING

The Fort Apache Indian Reservation (Figure 1-2) is in east central Arizona. The reservation is 75 miles long, 45 miles wide and encompasses more than 1.6 million acres in portions of Navajo, Apache and Gila counties. The reservation has a wide range of topography and climate. Whiteriver, the largest population center of the reservation and the seat of the tribal government, is 35 miles south of Show Low and 95 miles northeast of Globe. The southwestern desert foothills, at an elevation of 2,700 feet in the Salt River Canyon, contrast sharply with the mountainous, forested northeastern portions of the reservation where elevations exceed 11,000 feet in the Mt. Baldy area.

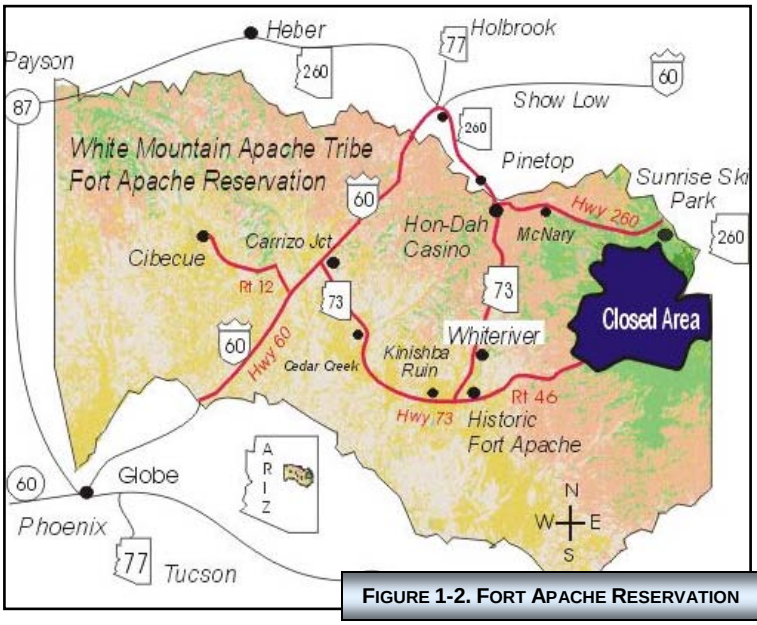


FIGURE 1-2. FORT APACHE RESERVATION

RECREATION AND TOURISM

The Apache Office of Tourism is located in General Crook's cabin (built in 1870) at Fort Apache. The Apache Cultural Museum, located on the 288-acre site at Fort Apache, provides insight into the culture of the Apache people. Tribal lands contain some of Arizona's most scenic country, with 25 excellent fishing lakes, 420 miles of trout streams, and more than 7,000 campsites. The mighty Salt River, whose waters originate almost exclusively on the reservation, offers white-water rafting and breathtaking scenery for kayakers and canoers. Guided white-water rafting tours are offered between February and June. The famous Fort Apache is being developed into a historic park. The tribal Culture Center, a recreation of an Apache Village, and walking tour of the Fort are popular attractions. Also on the reservation are the ancient Kinishba Ruins, Geronimo's Cave and the Alchesay Fish Hatchery. The tribe also operates one of the best ski resorts in the Southwest, Sunrise Park Resort. The Hon-Dah Casino and Conference Center also attracts many tourists to the reservation.

SOCIOECONOMIC CHARACTERISTICS

Examining the specific socioeconomic characteristics of the Town of Cibecue, the White Mountain Apache Tribe, and Navajo County will help determine the factors influencing aviation activity in the area and the extent to which aviation facility developments are needed in Cibecue. Characteristics, such as employment, demographic patterns, and income, will help in establishing the potential growth rate of aviation within the town and the county. In other words, by analyzing the information in this Chapter, forecasts of aviation activity can be developed. Those forecasts will be provided in Chapter 2.

LOCAL PROFILE

Community economic characteristics help identify the specific type of aviation activity common to the local area and unique to others. For example, one community's activity may be comprised primarily of business travel by commercial and corporate aircraft, while another community's activity may be defined by training or military operations. Another area may be dependent upon airfreight transport to and from manufacturing and resource industries, or still another may be predominately based on recreational and tourism travel by general aviation aircraft. The varying economic activities in each community require unique planning depending on the aviation needs of that community.

The White Mountain Apache Tribe operates a ski resort and casino on the reservation. The tribe also operates a Wildlife and Outdoor Recreation Division that controls hunting and fishing on the reservation through a permit system. The Indian Health Service (HIS), Whiteriver Service Unit, operates a 50-bed hospital in Whiteriver, which provides inpatient, outpatient and community health care. Inpatient services include general medical, pediatrics and obstetrics. Contract air service is provided from Whiteriver to Phoenix and a heliport is available at the hospital for emergency air-evacuation. In addition, outpatient and emergency services are provided by a separate, permanently staffed clinic located at Cibecue. Contract air service is also provided from Cibecue to Phoenix by Native Air Services Inc. of Mesa Arizona.

The Bureau of Indian Affairs (BIA) is an agency of the U.S. Department of the Interior. The principal objectives of the Bureau are: to actively encourage and train Indian and Alaska Native people to manage their own affairs under the trust relationship to the Federal Government; to facilitate, with maximum involvement of Indian and Alaska Native people, full development of their human and natural resource potentials; to mobilize all public and private aides to the advancement of Indian and Alaska Native people for use by them; and to utilize the skill and capabilities of Indian and Alaska Native people in the direction and management of programs for their benefit. The Bureau of Indian Affairs is comprised of numerous local area offices. The local BIA office in Whiteriver is the Fort Apache Agency. The Fort Apache Agency serves approximately 15,000 people, including those in the White Mountain Apache Tribe. This agency is under the jurisdiction of the Phoenix Area Office. The BIA Fort Apache Agency constructed the Cibecue Airport in 1997 to serve as a single engine air tanker base for fire fighting operations on the reservation.

POPULATION

As of the 2000 US Census, there were 1,331 people, 323 households, and 268 families residing in Cibecue. This is a 6 percent increase from the 1990 Census when the town reported 1,254 people. The Fort Apache Reservation population increased 20 percent from 1990 to 2000. The populations of Navajo County and the State of Arizona increased 26 percent and 40 percent respectively over the same time period. Table 1-1 shows this increasing population trend.

TABLE 1-1 POPULATION

	1980	1990	2000	2002
Cibecue	N/A	1,254	1,331	N/A
Fort Apache Reservation	8,080	10,394	12,429	12,958
Navajo County	67,629	77,658	97,470	101,615
Arizona	2,716,546	3,665,228	5,130,632	5,472,750

Sources: Arizona Department of Economic Security, US Census Bureau

The Arizona Department of Economic Security, Research Administration, and Population Statistics Unit developed population projections for all Arizona communities, counties and the State in 1997. Population projections as shown in Table 1-2 and Figure 1-3 indicate a 44 percent population increase for the State of Arizona from 2000 to 2020. Over this same time period the populations of Navajo County and Cibecue are projected to increase 15 percent and 55 percent respectively. The projection results in a 2020 Cibecue population of 2,069.

TABLE 1-2 POPULATION PROJECTIONS

	2005	2010	2015	2020
Cibecue	1,606	1,749	1,908	2,069
Navajo Co.	94,400	99,975	105,850	111,950
Arizona	5,553,825	6,145,125	6,744,800	7,363,625

Source: Arizona Department of Economic Security, Research Administration, Population Statistics Unit

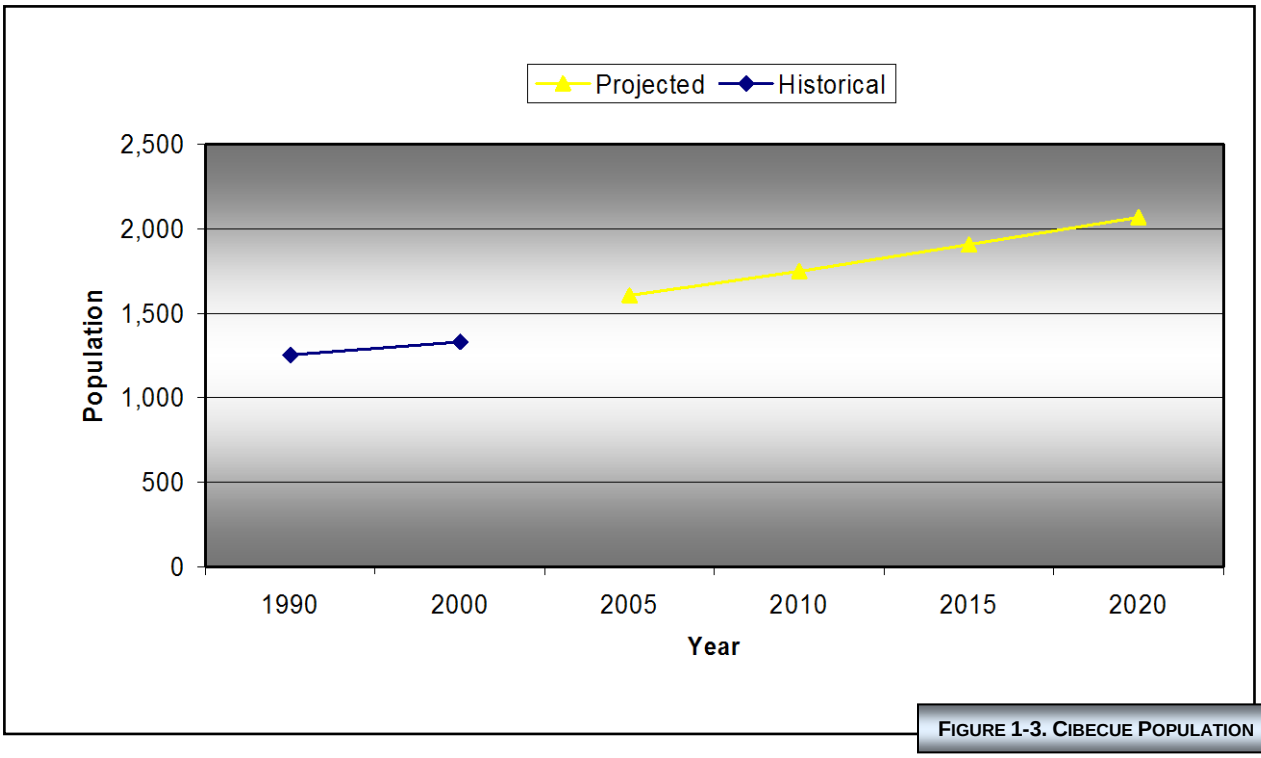


FIGURE 1-3. CIBECUE POPULATION

EMPLOYMENT

Economic activity on the Fort Apache Indian Reservation is primarily based on the plentiful natural resources and the scenic beauty of the land. The White Mountain Apache Tribe has gained a national reputation for its network of enterprises, including Fort Apache Timber Company, a finger-jointing/edge-gluing plant to use the sawmill's low-grade lumber, and a lumber and hardware retail center in Hon Dah. Tourism also drives the local economy and many tribal members are employed in the operation of the ski resort and casino, as well as the outdoor and recreation programs. The unemployment rate in 2002 was 28.1 percent on the Fort Apache Reservation and 10.2 percent for Navajo County according to the Arizona Department of Economic Security. Employment figures for Navajo County are shown in Table 1-3 and Figures 1-4 and 1-5.

TABLE 1-3 NAVAJO COUNTY EMPLOYMENT DISTRIBUTION

	1990	% of Total	2002	% of Total
Government	5,475	26%	10,950	40%
Construction	825	4%	1,325	5%
Trade	4,400	21%	5,775	21%
Agriculture	0	0%	229	1%
FIRE	450	2%	550	2%
Mining	1,175	6%	825	3%
Manufacturing	1,825	9%	975	4%
Services	4,875	24%	4,700	17%
Transportation, Communication, & Public Utilities	1,650	8%	2,125	8%
Total	20,675	100%	27,454	100%

Source: Arizona Department of Economic Security

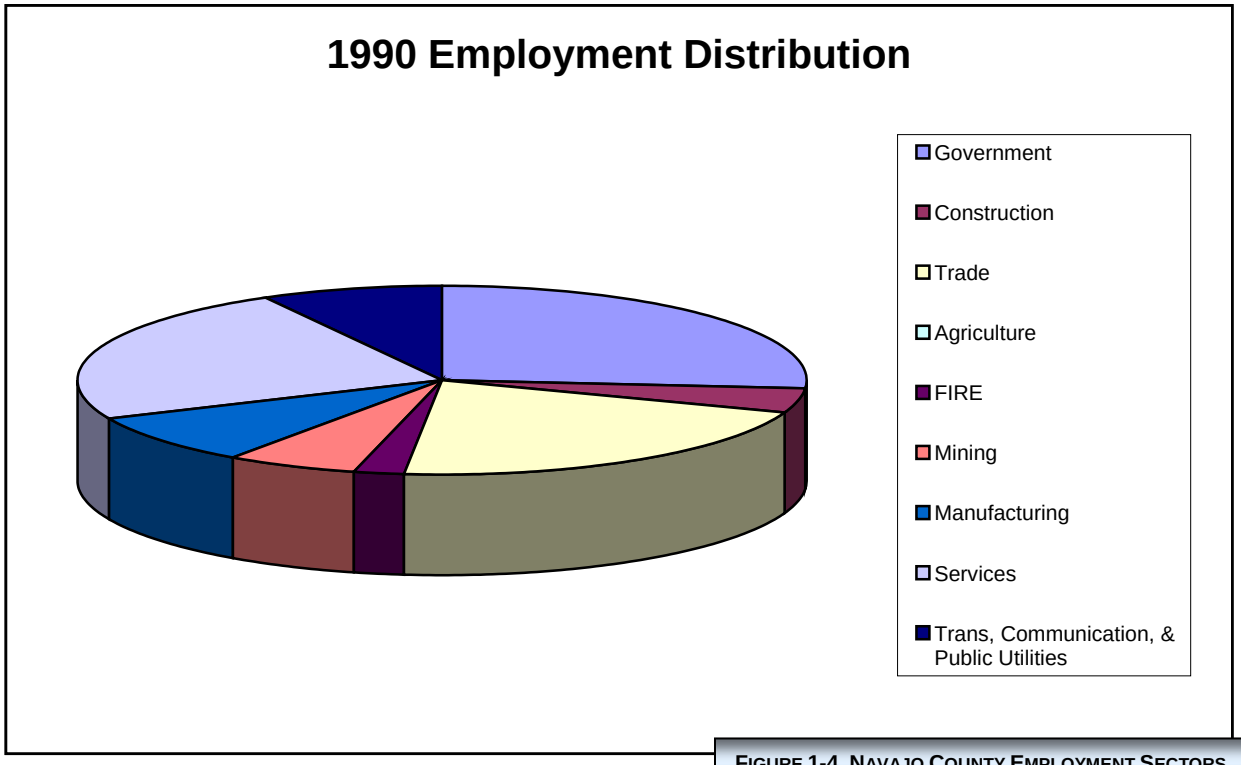


FIGURE 1-4. NAVAJO COUNTY EMPLOYMENT SECTORS

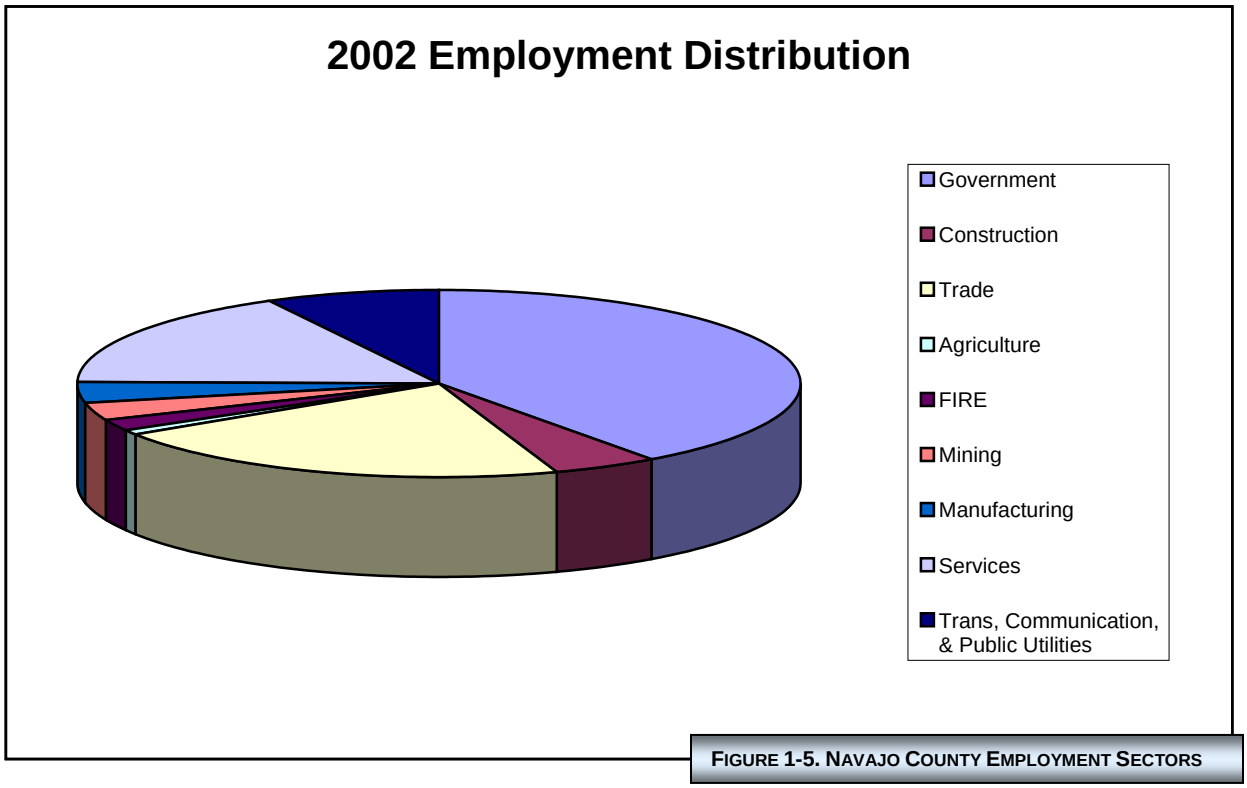


FIGURE 1-5. NAVAJO COUNTY EMPLOYMENT SECTORS

INCOME

According to the 2000 US Census, the median income for a household in Navajo County was $28,569, and the median income for a family was $32,409. The per capita income for the county in 2000 was $11,609. The percentage of the population living below the poverty line for the county was approximately 29.5 percent. The median income for a household in Cibecue was $12,286 and the median income for a family was $14,750. The per capita income for the town was $5,941 meaning 69 percent of the population is living under the poverty line.

CERTIFICATED PILOTS AND REGISTERED AIRCRAFT

The FAA database of certificated airmen and registered aircraft was reviewed to determine the 2003 distribution of pilots and registered aircraft in Cibecue and surrounding areas. This data indicates that there are no registered aircraft or pilots in Cibecue or Whiteriver. Towns within a 40-mile radius were reviewed for certificated pilot and registered aircraft and are listed in Table 1-4.

TABLE 1-4 CERTIFICATED PILOTS AND REGISTERED AIRCRAFT NEAR CIBECUE

	Aircraft	Pilots
Show Low	27	35
Pinetop	4	11
Young	6	4
Heber	3	1
Overgaard	34	19
Snowflake	8	8

INVENTORY OF EXISTING AIRPORT FACILITIES

AREA AIRPORT/SERVICE AREA

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.), proximity to its users, quality of ground access, required driving time to the airport, and the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Cibecue, the airports in the area and their specific services and facilities were reviewed.

The nearest public airport with a paved surface is located approximately 26 nautical miles southeast in Whiteriver, Arizona. Whiteriver Airport is an uncontrolled airport with one primary runway. The runway is 6,288 feet long and 75 feet wide. The next closest public use airport with a paved runway is Show Low Municipal Airport located in the Town of Show Low approximately 27 nautical miles to the northeast. Runway 6/24 at Show Low is 7,200 feet long and 75 feet wide, while the crosswind runway as Show Low is 3,937 feet long by 66 feet wide. Mogollon Airpark in Overgaard is located approximately 25 nautical miles north of Cibecue, but is a private airport requiring owner permission to use. Figure 1-6 shows the approximate service area for Cibecue. Table 1-5 provides a summary of all airports within the vicinity of Cibecue.

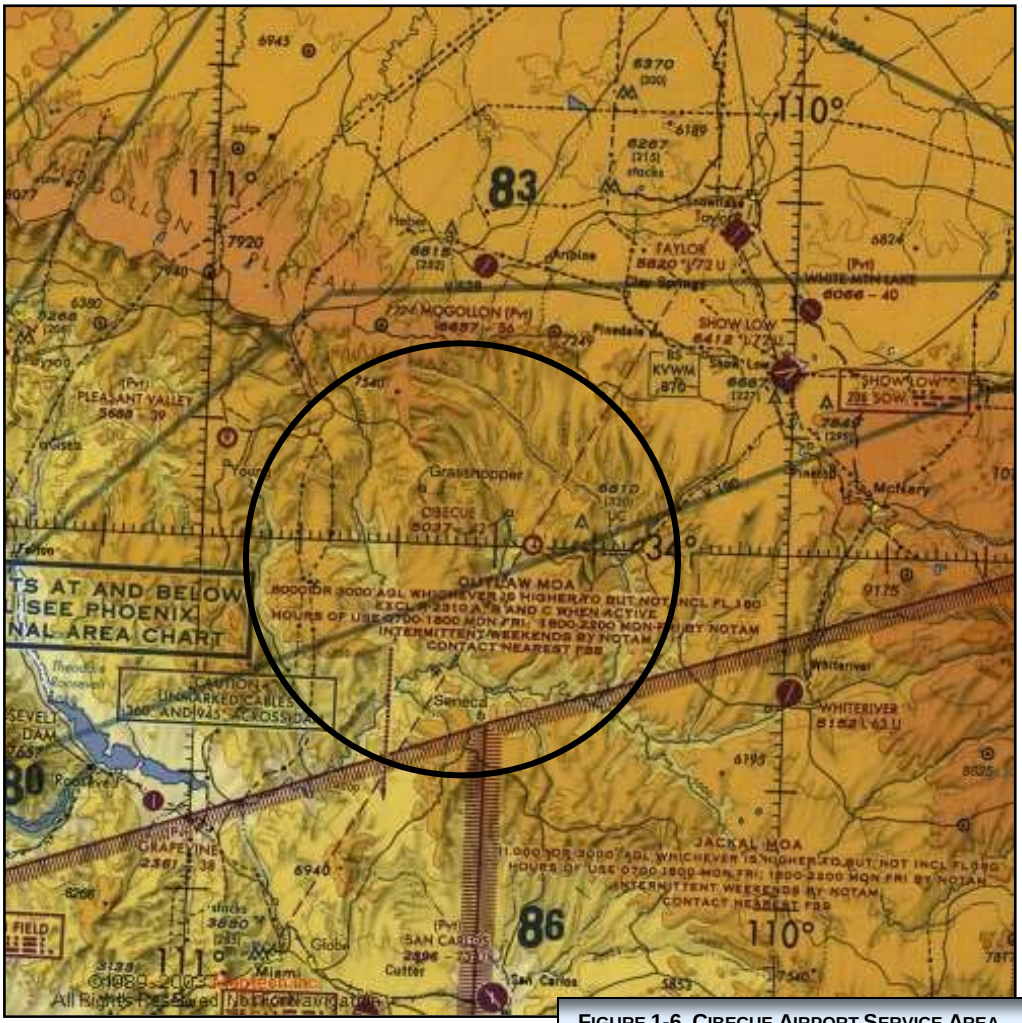


FIGURE 1-6. CIBECUE AIRPORT SERVICE AREA

TABLE 1-5 AIRPORTS SURROUNDING CIBECUE

	Identifier	Distance (Nautical Miles)	Distance (Highway Miles)	NPIAS Status	Runway Length(s) Width(s)	Pavement Type	Instrument Approaches	Fuel Available
Whiteriver Airport, Whiteriver, AZ	E24	26 SE	48	GA	6,288' x 75'	asphalt	VFR	No
Show Low Municipal, Show Low, AZ	SOW	27 NE	44	GA	7,200' x 75' 3,937' x 60'	asphalt	GPS/NDB	Yes
Taylor Airport, Taylor, AZ	TYL	29 NE	60	GA	7,200' x 75'	asphalt	GPS	Yes
Mogollon Airpark, Overgaard, AZ	N/A	25 N	74	PVT	5,600' x 50'	asphalt	VFR	No
Payson Airport, Payson, AZ	PAN	48 W	78	GA	5,500' x 75'	asphalt	GPS	Yes
Grapevine Airport, Roosevelt, AZ	N/A	39 SW	99	PVT	3,800' x 40'	asphalt	VFR	No
San Carlos Apache Airport, Globe, AZ	P13	41 S	71	GA	6,500' x 100'	asphalt	GPS	No
San Carlos Airport, San Carlos, AZ	N/A	39S	78	PVT	7,335' x 70'	asphalt	VFR	No

LOCATION

The Town of Cibecue is located approximately 84 nautical miles northeast of Phoenix. The existing airport is located approximately 3 nautical miles south of the Town of Cibecue. The airport consists of one gravel/dirt airstrip located immediately south of BIA Route 12. The alignment of the airport is primarily east/west, or slightly northeasterly/southwesterly. The runway is identified as Runway 07/25.

FACILITIES

Currently there are no facilities at the existing airport, although, the BIA Forestry Division maintains two water/slurry tanks at the east end of the airport for air tanker operations. The only other existing operation at the airport is a natural resource compound located north of midfield. This compound serves as a staging area for excavation activities being conducted off the end of Runway 7.

LAND OWNERSHIP

All land on the Fort Apache Reservation is owned and controlled by the White Mountain Apache Tribe. The Cibecue Airport is located on Tribal owned land dedicated for airport use by the Tribe. The BIA Fort Apache Agency constructed the airport in 1997.

BASED AIRCRAFT AND OPERATIONS

Historically, based aircraft at Cibecue Airport have been contract fire aircraft. During a typical fire season an Air Tractor 802F and a Bell 206 Jet Ranger are seasonally based at the airport. Operations for these two-based aircraft were estimated at over 1,200 per year in 2002. However, it is difficult to estimate annual operations because of the variable nature of fire fighting activities. Additional existing operations at the Cibecue Airport include aerial reseeding, air medivac and doctor visits to the Cibecue Clinic, as well as some additional business and recreational flights.

TOPOGRAPHY AND TERRAIN

The Town of Cibecue (Figure 1-7) is located at an approximate elevation of 5,000 feet Mean Sea Level (MSL). The town is tucked in a rugged valley in the shadow of Arizona's Mogollon Rim. The general topography of the area consists of a steep valley following the southerly flow of Cibecue Creek. Elevations in the area range from just under 5,000 feet at the floor of the valley to over 7,500 feet just 18 miles northeast at the edge of the Mogollon Rim. Elevation on the ridge just 5 miles northeast of Cibecue clear 6,700 feet while the ridge just 5 miles southeast of town peaks at approximately 6,424 feet MSL. There is also significant high terrain immediately east of the existing runway and a high ridgeline south of the runway. Cibecue Creek is shown in Figure 1-8. The creek is popular with Trout fisherman, and attracts many anglers to the Cibecue area on an annual basis.

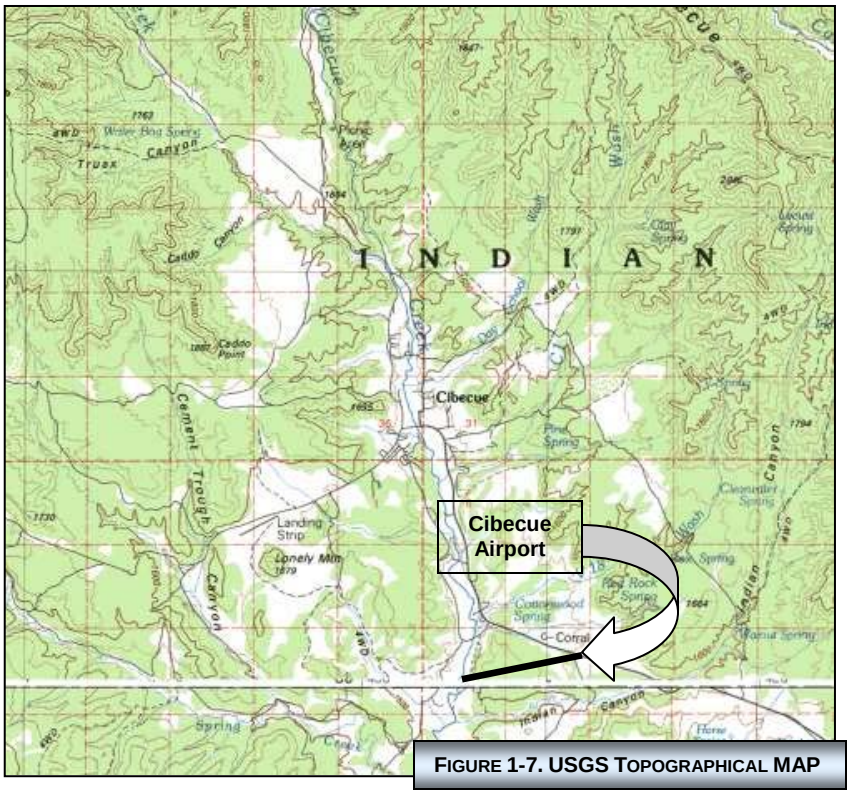


FIGURE 1-7. USGS TOPOGRAPHICAL MAP

FIGURE 1-8. CIBECUE CREEK

SOILS

There are two specific soil types found at the existing Cibecue Airport, Tours Silt Loam and Roundtop-Rock Outcrop Complex. The Tours soil is a silt loam and silty clay loam classified under the United Soil Classification as CL. CL soils typically have a California Bearing Ratio (CBR) of 5 to 15. The Roundtop is a more gravelly clay loam type of soil. Roundtop soil is classified as CL, CH, or GC under the United Soil Classification system. CH soils typically have a poor CBR of only 3 to 5 while GC soils typically have an excellent CBR of 20 to 40.

AIRSIDE AND LANDSIDE CHARACTERISTICS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area, and any visual or electronic approach navigational aids. An overview of the Cibecue Airport facilities is provided in Table 1-6.

TABLE 1-6 CIBECUE AIRPORT FACILITIES

	Facility	Condition
Runway	Length: 4,200' Width: 100' Surface: Dirt/Gravel Marking: none Nav Aids: none	Fair/Poor
Taxiways	None	N/A
Aircraft Aprons	None	N/A
Perimeter Fencing	Barb Wire	Fair
Fuel	None	N/A

RUNWAY

The existing airport runway (as shown in Figure 1-9) is published as 4,200 feet long by 100 feet wide and was constructed in 1997 to serve as a base of operations for fire fighting and suppression. The runway surface is composed of dirt and gravel. The majority of the runway slopes downward from east to west at an approximate 2 percent gradient. There is a grade break near the west end of the runway where the runway levels off and begins to slope slightly upward.

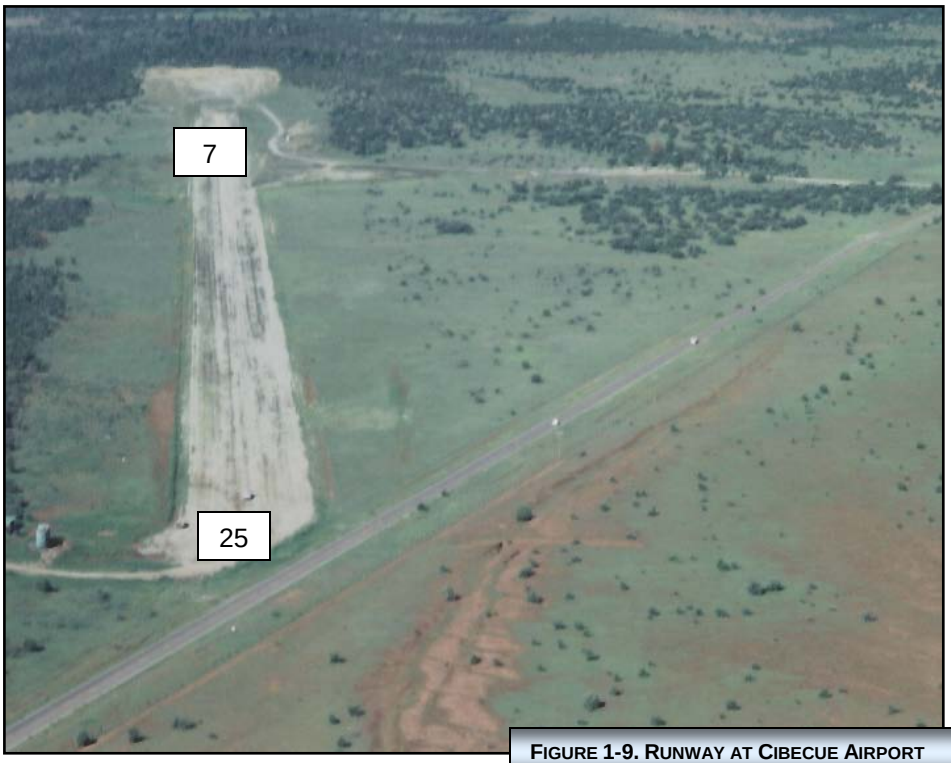


FIGURE 1-9. RUNWAY AT CIBECUE AIRPORT

TAXIWAYS

Taxiways provide a surface for aircraft access from the parking apron to and from the runways. They expedite aircraft departures from the runway and increase operational safety and efficiency. There are no taxiways at the existing Cibecue Airport.

AIRCRAFT APRON

The aircraft apron provides an area for aircraft to park. The apron is typically connected to the runway via taxiways or taxilanes. There is a small dirt/gravel apron area off on the south end of Runway 25 where air tankers are loaded.

AIRFIELD LIGHTING

Guidance on airport lighting standards is provided in FAA Advisory Circular (AC) 150/5340-24, *Runway and Taxiway Edge Lighting Systems*. Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground.

Several common airfield lighting and visual aid features of general aviation airports include a rotating beacon (activated by photoelectric cell for dusk to dawn operations), pilot-controlled Medium Intensity Runway Lights (MIRLs) (activated by aircraft radio signal), threshold lights and Runway End Identifier Lights (REILs) which mark the runway threshold with flashing strobe lights, Medium Intensity Taxiway Lights (MITLs) and/or reflective markers, and Precision Approach Path Indicators (PAPIs) to provide descent guidance information during an approach to the runway.

The existing Cibecue Airport does not have any airfield lighting or lighted visual aids to provide for nighttime or inclement weather operations. There is an unlighted wind sock located on the water/slurry tanks at the east end of the airport and another unlighted wind sock at the west end of the airport.

NAVIGATIONAL AIDS

The existing Cibecue Airport does not currently have any ground-based navigational aids on airport property to aid pilots in enroute or terminal area operations. The closest navigational aid to Cibecue Airport is the Winslow Very High Frequency Omnidirectional Range, Tactical Information (VOR-TAC), located approximately 67 nautical miles (nm) to the northwest. Two additional navigational aids in the vicinity of Cibecue are the St. Johns VOR-TAC approximately 70 nm to the northwest and the Phoenix VOR-TAC located approximately 89 nm to the southwest. The Cibecue Airport is located immediately below a Victor Airway (V 190). A Victor Airway serves as a highway in the sky. The floor of the Victor Airway above Cibecue is 11,500 feet MSL and extends six nautical miles on each side of the airway. The purpose of V 190 is to provide a direct route between Phoenix and St. Johns over mountainous terrain.

AIRPORT SERVICES/FIXED BASE OPERATIONS

A Fixed Base Operator (FBO) is usually a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include aircraft fueling, minor maintenance and repair, aircraft rental and/or charter services, flight instruction, pilot lounge and flight planning facilities, and aircraft tiedown and/or hangar storage. There are no FBO or other airport services available at Cibecue Airport.

BUILDING AREA

The building area of a typical general aviation airport usually consists of FBO offices and/or hangars, a pilot lounge, terminal building, eating facility, additional aircraft hangars, a maintenance building, and other related structures. There are no existing buildings or structures at Cibecue Airport.

UTILITIES

There are currently no utility services provided to the Cibecue Airport. On-site storage tanks are used to supply water and slurry for fire suppression operations. Water and sewer in the Town of Cibecue are provided by the tribe through the Whiteriver Regional System. Electricity on the reservation is provided by Navopache Electric Coop. in Fort Apache. Telecommunications are provided statewide by Frontier Communications.

GROUND ACCESS

Vehicular access to the Town of Cibecue is provided by BIA Route 12 which connects to U.S. Highway 60. US 60 is the main highway between Show Low and Phoenix. There is a small dirt access road off BIA Route 12 to the airport. There is also a second access road to the airport off of BIA Route 12 at midfield where the Natural Resource Compound is located.

AIRCRAFT FUEL FACILITIES

A Fixed Base Operator (FBO) or the airport sponsor often provides aircraft fuel services. Combinations of 100LL and 80 Octane Aviation Gas, and/or Jet-A fuel are usually provided depending on the aircraft traffic mix. These fuels may be stored in underground storage tanks, above ground storage tanks, fuel trucks, or a combination of the three.

There are currently no aircraft fueling services available at Cibecue Airport and no aircraft fuel storage facilities. The contracted air tanker company provides fuel for air tanker operations seasonally.

AIRPORT FENCING

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the airport property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150-5300-13, *Airport Design*, and Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*.

There is a barbwire fence around the entire Cibecue Airport. A section of the perimeter fence on the north side of the airport at the Natural Resource Compound is chain link with locking gates. Horses and cattle are reported as the most frequent livestock incursions at the airport.

EMERGENCY SERVICES

Emergency fire and ambulance services are available at Whiteriver. The closest hospital is also in Whiteriver, however, there is an Indian Health Service (IHS) clinic located in Cibecue. There is also a helipad located at the IHS clinic.

FAA SAFETY AND DESIGN STANDARDS

FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, establishes design standards for airports based on the size of the airport. When design standard deficiencies exist, the FAA recommends immediate correction of such deficiencies. Design standards are based on the Airport Reference Code and approach visibility minimums of the airport. The ARC is a combination of the wingspan and approach speed of the critical aircraft operating at the airport. The ARC for the Cibecue Airport is B-II. A more detailed discussion of Airport Reference Codes is included in Chapter 3. Some of the design standard deficiencies that exist at the existing Cibecue Airport are described below and illustrated on the next page in Figure 1-11.

The runway safety area and object free area standards for both Runway 7 and Runway 25 are not met. The terrain immediately off the south side of Runway 7 and off the end of Runway 7 slopes dramatically downward and would not provide a safe overrun for an aircraft that might veer off or overrun the runway. Also, the end of Runway 25 is located less than 40 feet from BIA Route 12 (see Figure 1-) making the road a safety and object free area penetration. Taking the deficiencies into consideration results in an effective usable runway length of 3,600 feet.

SAFETY AREAS

Runway and Taxiway Safety Areas (RSAs and TSAs) are a defined surface surrounding the runway or taxiway prepared specifically to reduce the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations;
- Drained so as to prevent water accumulation;
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

The runway safety areas at the existing Cibecue Airport do not meet these standards. The terrain off of the Runway 7 slopes dramatically downward. Also, BIA Route 12 and the perimeter fencing penetrates the runway safety area.

OBSTACLE FREE ZONE (OFZ) AND OBJECT FREE AREAS (OFA)

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function.

The Runway OFZ is similar to the FAR Part 77 Primary Surface insofar that is represents the volume of space longitudinally centered on the runway. It extends 200 feet beyond the end of each runway.

The Runway Object Free Area (OFA) is a two-dimensional ground area surrounding the runway. The runway OFA standard precludes parked airplanes, agricultural operations, and objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. BIA Route 12 is a runway OFA penetration.

THRESHOLD SITING SURFACE

According to FAA AC 150/5300-13, the runway threshold should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object obstructs the airspace required for landing airplanes is beyond the airport owner's power to remove, relocate, or lower. Thresholds may also be displaced for environmental considerations such as noise abatement, or to provide the standard RSA and OFA lengths.

Based on the visual approach and size of aircraft using the Cibecue Airport, in order to meet FAA design standards, no object should penetrate a surface that starts at the threshold of Runway 7/25 and at the elevation of the runway centerline at the threshold and slopes upward from the threshold at a slope of 20 (horizontal) to 1 (vertical).

In the plan view, the centerline of this surface extends 5,000 feet along the extended runway centerline. This surface extends laterally 200 feet on each side of the centerline at the threshold and increased in width to 500 feet at a point 1,500 feet form the threshold; thereafter it extends laterally 500 feet on each side of the centerline. Currently, terrain east of the airport penetrates the threshold siting surface. Based on this requirement the threshold for Runway 25 at Cibecue Airport would need to be displaced approximately 3,180 feet to clear the terrain at a 20:1 slope.

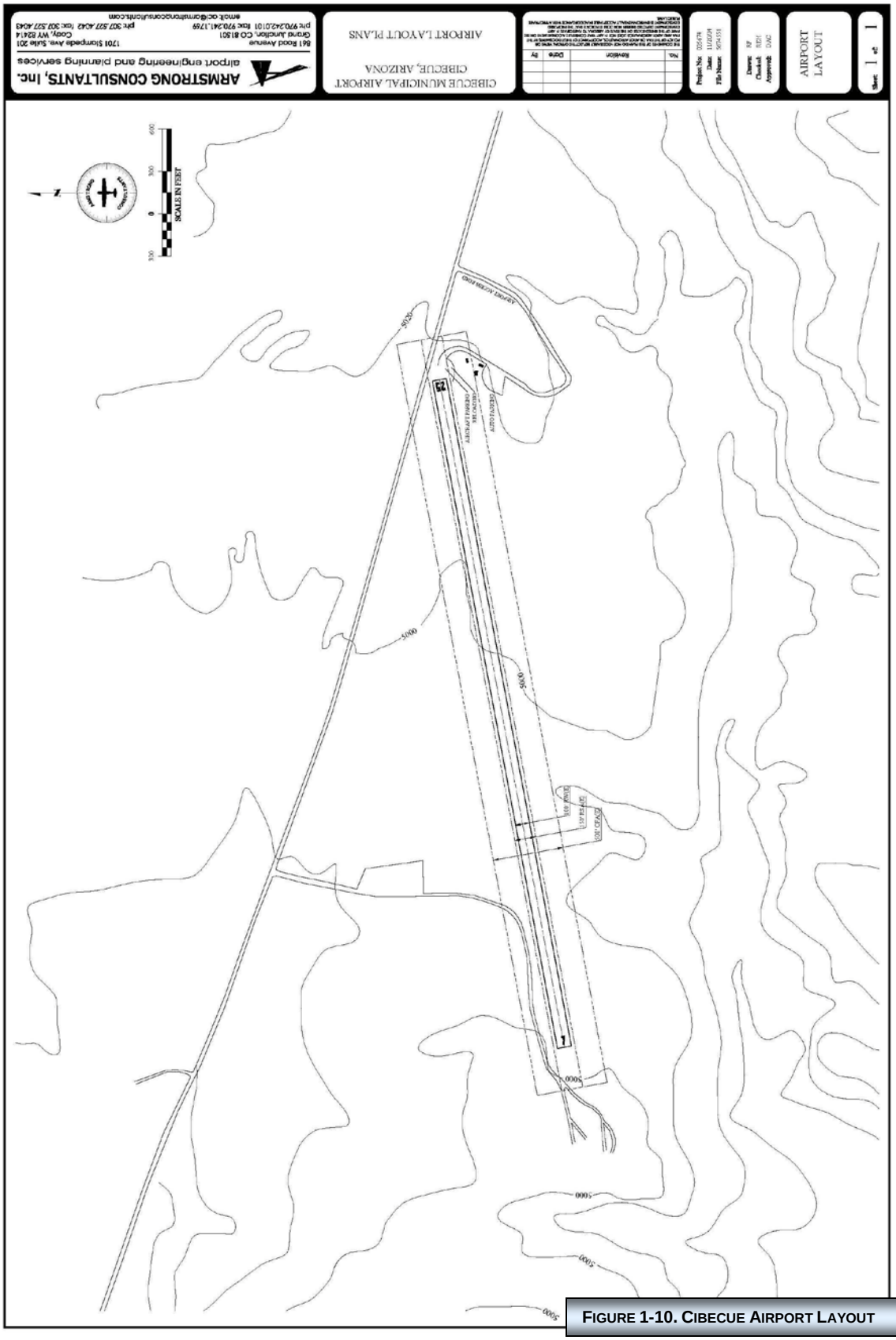


FIGURE 1-10. CIBECUE AIRPORT LAYOUT

AIRSPACE CHARACTERISTICS

The National Airspace System consists of various classifications of airspace that are regulated by the FAA. Airspace is either controlled or uncontrolled. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) and must follow either Visual Flight Rule (VFR) or Instrument Flight Rule (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment, and pilot certification vary depending on the Class of airspace and are described in Federal Aviation Regulations (FAR) Parts 71, *Designation of Class A, Class B, Class C, Class D, and Class E Airspace Areas; Airways; Routes; and Reporting Points*, and FAR Part 91, *General Operating and Flight Rules*.

General definitions of the Classes of airspace are provided below:

- **Class A Airspace**: Airspace from 18,000 feet Mean Sea Level (MSL) up to and including Flight Level (FL) 600.
- **Class B Airspace**: Airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements.
- **Class C Airspace**: Generally, airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control, and that have a certain number of IFR operations or passenger enplanements. The airspace usually consists of a five nautical mile (nm) radius core surface area that extends from the surface up to 4,000 feet above the airport elevation and a 10 nm radius shelf area that extends from 1,200 feet up to 4,000 feet above the airport elevation.
- **Class D Airspace**: Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.
- **Class E Airspace**: Generally, controlled airspace that is not Class A, Class B, Class C, or Class D.
- **Class G Airspace**: Generally, uncontrolled airspace that is not designated Class A, Class B, Class C, Class D, or Class E.

Figure 1-11 on the following page provides a graphical depiction of the airspace surrounding Cibecue Airport. The Cibecue Airport is situated within Class G Airspace, up to 11,500 feet MSL. From 11,500 feet to 18,000 feet MSL the airspace above Cibecue is classified as Class E and above 18,000 feet MSL the airspace is classified as Class A. Class B Airspace surrounds Phoenix Sky Harbor International Airport, located approximately 85 nm to the southwest. Class C Airspace surrounds Tucson International Airport and Davis-Monthan Air Force Base, both located 112 nm south of Cibecue.

The traffic patterns to the Cibecue Airport are standard left hand traffic to both runways, meaning pilots make left hand turns when approaching the airport. There are no noise abatement procedures currently in place at the airport and there are currently no operations that are considered "touch-and-go" operations. The Cibecue Airport is also located in the vicinity of some noise sensitive wilderness areas. The Sierra Ancha Wilderness Area is located approximately 22 nautical miles southwest, the Salome Wilderness Area is located approximately 25 nautical miles southwest, the Salt River Canyon Wilderness Area is located approximately 13 miles southwest, the Baldy Peak Wilderness Area is approximately 40 nautical miles east and the Hellsgate Wilderness Area is approximately 24 nautical miles west. Airspace and land use planning are further discussed in Chapter 3.

AIRSPACE JURISDICTION

The Town of Cibecue is located within the jurisdiction of the Albuquerque Air Route Control Center (ARTCC) and the Prescott Flight Service Station (FSS). The altitude of radar coverage by the Albuquerque ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions, and surrounding terrain. The Prescott FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

AIRSPACE RESTRICTIONS

The Cibecue Airport is located in the vicinity of several Military Operations Areas (MOAs) and low-level military training routes (MTRs) (see Figure 1-12). MOAs and MTRs are established for the purpose of separating certain military training activities, which routinely necessitate acrobatic or abrupt flight maneuvers, from Instrument Flight Rules (IFR) traffic. Nonparticipating IFR traffic can be cleared through an active MOA if IFR separation can be provided by Air Traffic Control (ATC), otherwise ATC will reroute or restrict the nonparticipating IFR traffic.

The Cibecue Airport is situated approximately 16 miles northeast of the Outlaw MOA and 15 miles north of the Jackal MOA. The airport is also located approximately 43 miles west of the Reserve MOA. Use of the Outlaw MOA occurs between the hours of 7:00 AM and 6:00 PM, Monday through Friday at an altitude of 8,000 feet Mean Sea Level (MSL) or 3,000 feet Above Ground Level (AGL), whichever is higher. Use of the Jackal MOA occurs between the hours of 7:00 AM and 6:00 PM, Monday through Friday at an altitude of 11,000 feet MSL or 3,000 feet AGL, whichever is higher. Use of the Reserve MOA occurs intermittently and is published by notice to airman (NOTAM). The altitude of use for the Reserve MOA is 5,000 AGL.

In addition to the MOAs and restricted areas, several Military Training Routes (MTRs) exist in the vicinity of Cibecue. The MTR program is a joint venture by the FAA and the Department of Defense (DOD). MTRs are mutually developed for use by the military to conduct low-altitude, high-speed training. Just over five nautical miles to the northeast of Cibecue is Military Training Route IR320, an instrument MTR. Traffic on IR320 flows west and north from Cibecue. Approximately 16 miles southwest of Cibecue is Military Training Route VR239, a visual MTR. Traffic on VR239 flows southeast from Cibecue.

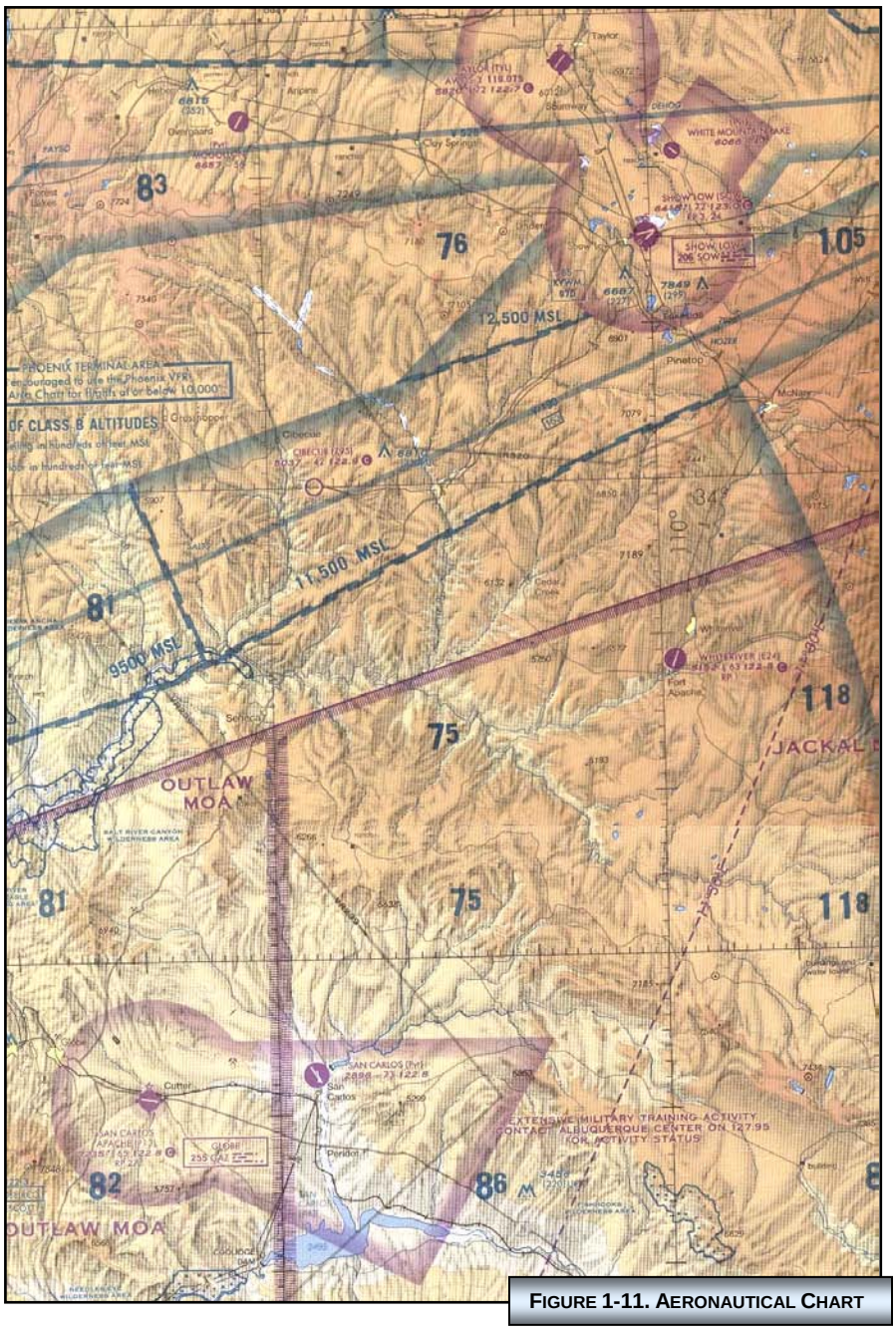


FIGURE 1-11. AERONAUTICAL CHART

FEDERAL AVIATION REGULATION (FAR) PART 77 AIRSPACE SURFACES

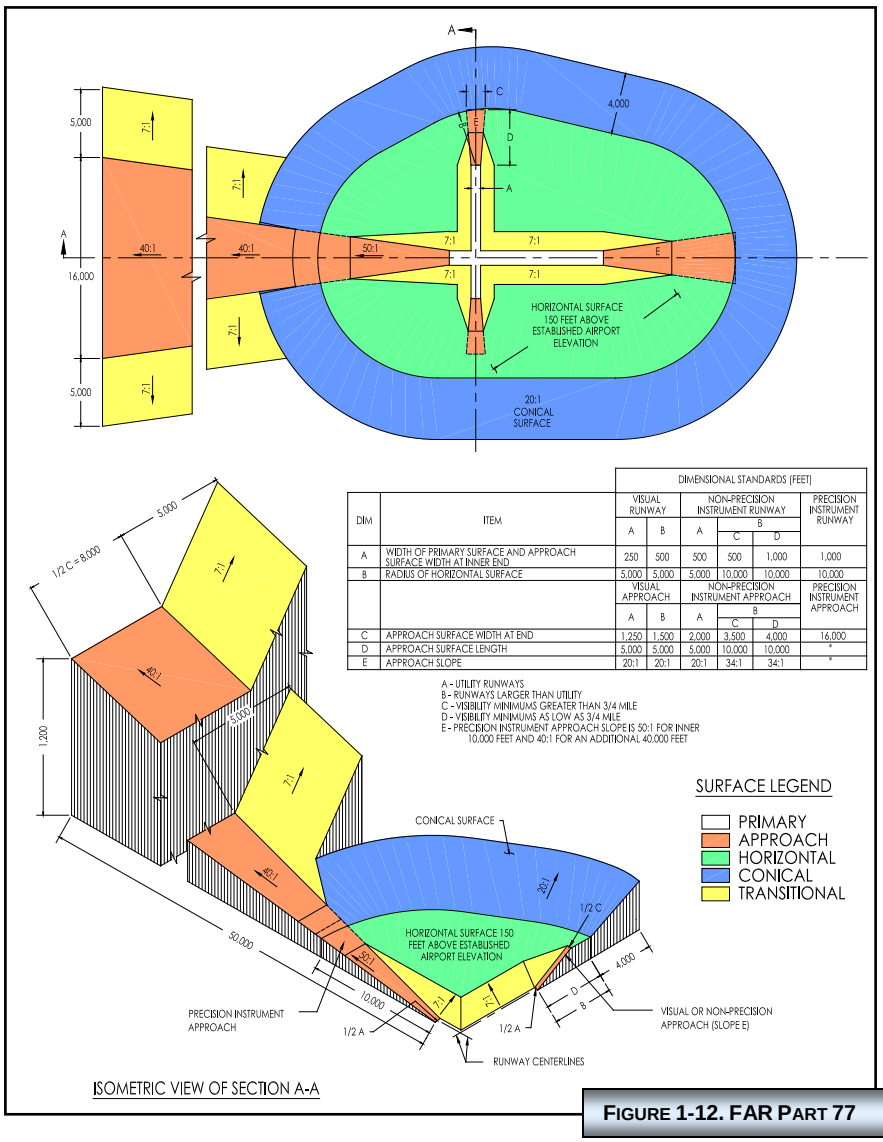
Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, established several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in Figure 1-12. The Primary, Approach, Transitional, Horizontal, and Conical Surfaces identified in FAR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific FAR Part 77 runway category criteria.

Primary Surface: The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline.

Approach Surface: The Approach Surface is longitudinally centered on the extended runway centerline and extends outward and upward from the Primary Surface. An Approach Surface is applied to each end of the runway based upon the type of approach available or planned for that runway at slopes of either 20:1, 34:1, or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the FAR Part 77 runway classification criteria.

Transitional Surface: The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

Horizontal Surface: The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

FIGURE 1-12. FAR PART 77

Conical Surface: The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

As stated previously, the terrain in the vicinity of Cibecue is very mountainous and consequently, numerous penetrations of the FAR Part 77 airspace surfaces exist at the Cibecue Airport. These terrain penetrations are shown in Figure 1-13. The areas south and east of the airport showing a diagonal hatch are terrain penetrations of the imaginary airspace surfaces. These penetrations include the approach surface to Runway 25, the horizontal surface, the transitional surface, and the conical surface.

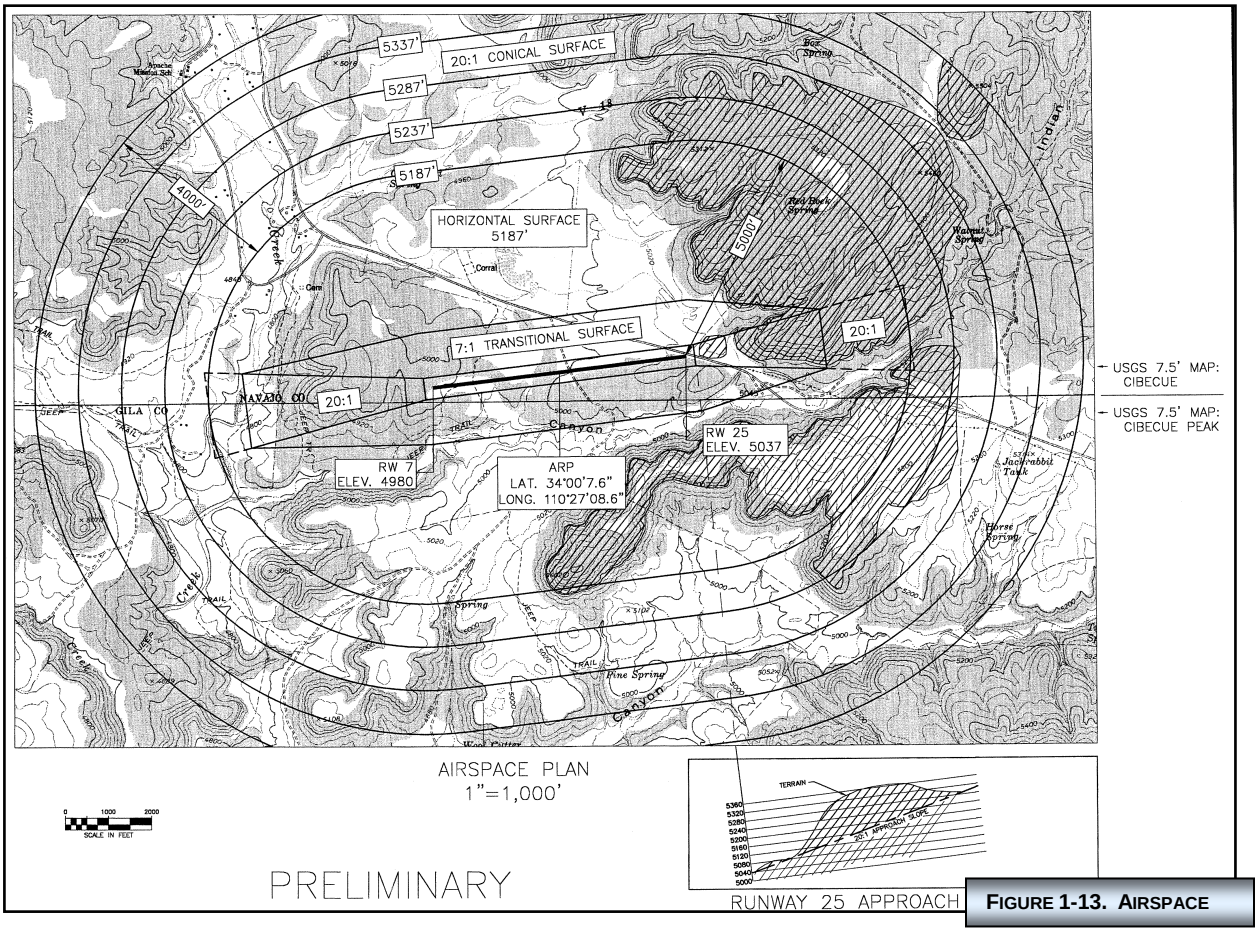


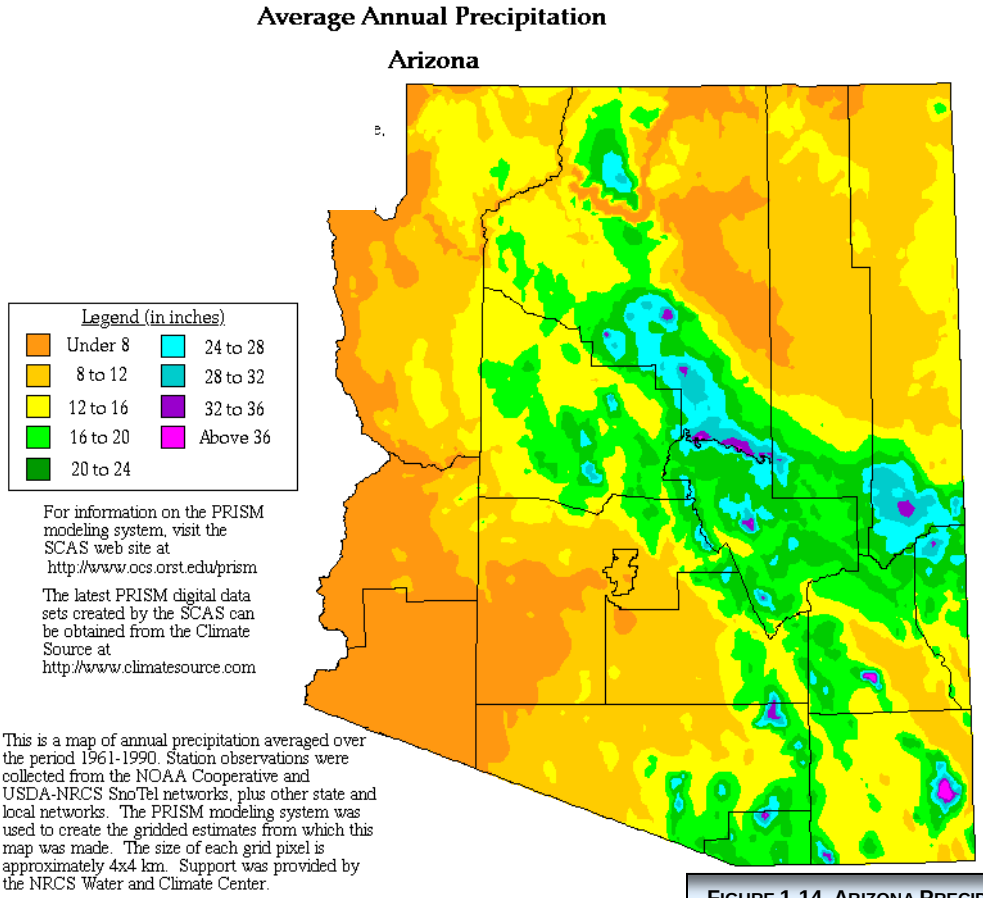
FIGURE 1-13. AIRSPACE

METEOROLOGICAL CONDITIONS

Meteorological conditions have a direct impact on the operational characteristics of an airport. These conditions determine the regulations under which operations may be conducted, the frequency of use for each operational configuration, and the instrumentation required to assist aircraft in landing and departing.

LOCAL CLIMATOLOGICAL DATA

Cibecue is located in southern Navajo County in an area that receives approximately 16 to 20 inches of precipitation annually. Average annual rainfall for the Town of Cibecue is 18.54 inches and the total annual snowfall is 18.5 inches. The average maximum temperature of the hottest month, July, is 91.3 degrees Fahrenheit, while the average minimum temperature of the coldest month, January, is 52.3 degrees. The annual average maximum temperature is 72.0 degrees, and the annual average minimum temperature is 36.5 degrees.



Source: Spatial Climate Analysis Service, Oregon State University

FIGURE 1-14. ARIZONA PRECIPITATION

CEILING AND VISIBILITY CONDITIONS

Ceiling and visibility conditions are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of the airport to instrument approach and departure operations until conditions change. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather than Visual Flight Rules (VFR). Under Instrument Flight Rules, the pilot maneuvers the aircraft through sole reference to instruments in the aircraft and navigational aids on the ground. The airport must be closed for use when conditions are worse than the published IFR minimums for that airport. When flight conditions are visual, or Visual

Meteorological Conditions (VMC), the pilot can maneuver the aircraft by reference to the horizon and objects on the ground.

RUNWAY WIND COVERAGE

Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and takeoff into the wind and therefore can tolerate only limited crosswind components (the percentage of wind perpendicular to the runway centerline). The ability to land and takeoff in crosswind conditions varies according to pilot proficiency and aircraft type.

FAA Advisory Circular 150/5300-13, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Airport Reference Code is shown in Table 1-7.

Wind data for Cibecue was obtained from two Remote Automated Weather Stations (RAWS) near Cibecue. RAWS are usually owned and operated by wildland fire agencies and are placed in locations where they can monitor fire danger. RAWS wind speed and direction data is available from the Western Regional Climatic Center (WRCC) based on a 16-point wind rose. The first RAWS station where data was collected is Cibecue Ridge, located approximately 5 nautical miles northeast of the airport. This station was recently installed to monitor fire conditions after the Rodeo/Chediski fire, which

TABLE 1-7 CROSSWIND COMPONENT

Allowable Crosswind in Knots	Airport Reference Code
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III, & C-I through D-III
20 knots	A-IV through D-VI

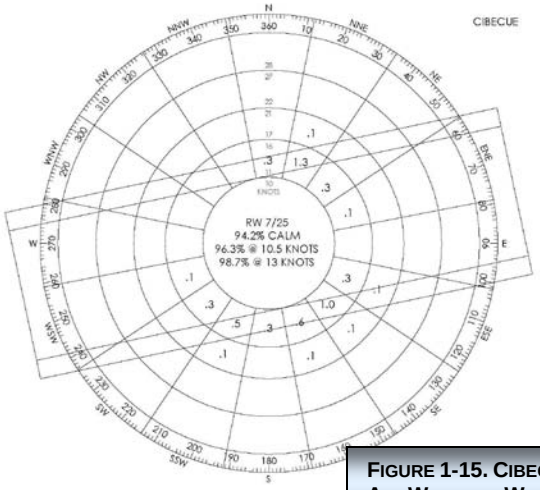


FIGURE 1-15. CIBECUE RIDGE ALL WEATHER WIND ROSE

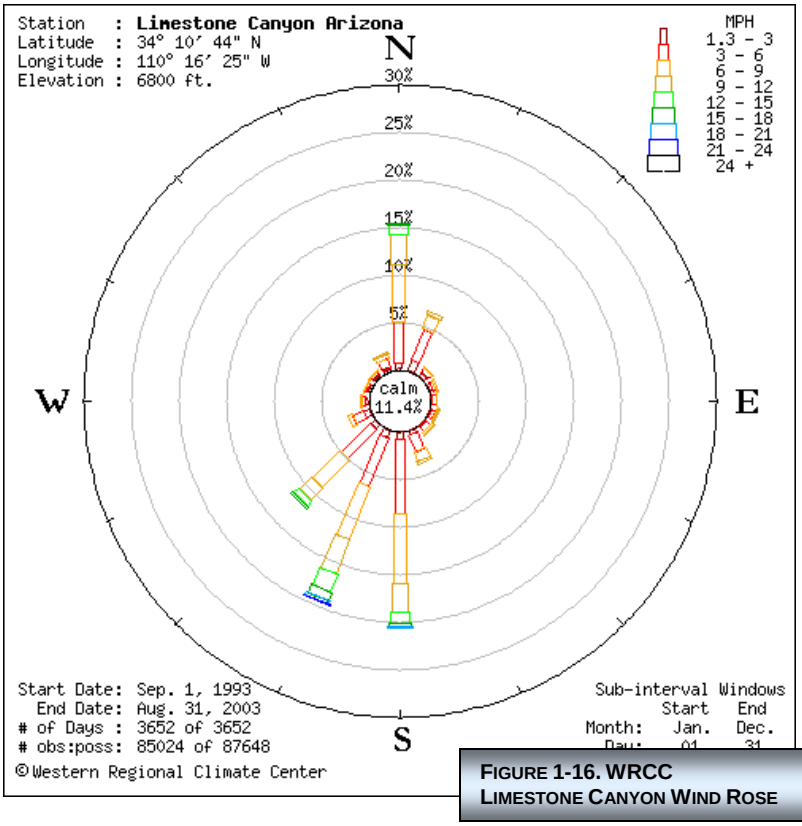


FIGURE 1-16. WRCC LIMESTONE CANYON WIND ROSE

started just north of Cibecue. A wind rose was created with 12 months of observations from the Cibecue Ridge RAWS station and is shown in Figure 1-15. According to the Cibecue Ridge wind rose, Runway 7/25 at Cibecue Airport has a 10.5 knot crosswind coverage of 96.3% and a 13.0 knot crosswind coverage of 98.7%.

However, because only one year of data was available from the Cibecue Ridge RAWS, data from a second RAWS station near Cibecue was analyzed. The Limestone Canyon RAWS is located approximately 13 nautical miles northeast of Cibecue Airport. Ten years of hourly wind observations were analyzed for the Limestone Canyon RAWS resulting in the WRCC wind rose in Figure 1-16. When this data is organized into the FAA standard wind rose format, Runway 7/25 at Cibecue Airport has a 10.5 knot crosswind coverage of 94.46% and a 13 knot crosswind coverage of 97.0% (Figure 1-17). However, the prevailing wind is obviously more southwesterly than the current runway alignment. Airport users report this as a significant problem. According to the BIA, air tanker operations have often had to be delayed or canceled due to significant crosswinds at the Cibecue Airport.

Based on the Limestone Canyon wind rose, a runway alignment of approximately of 10 degrees and 190 degrees or 1/19 would provide close to 100% crosswind coverage at 13 knots.

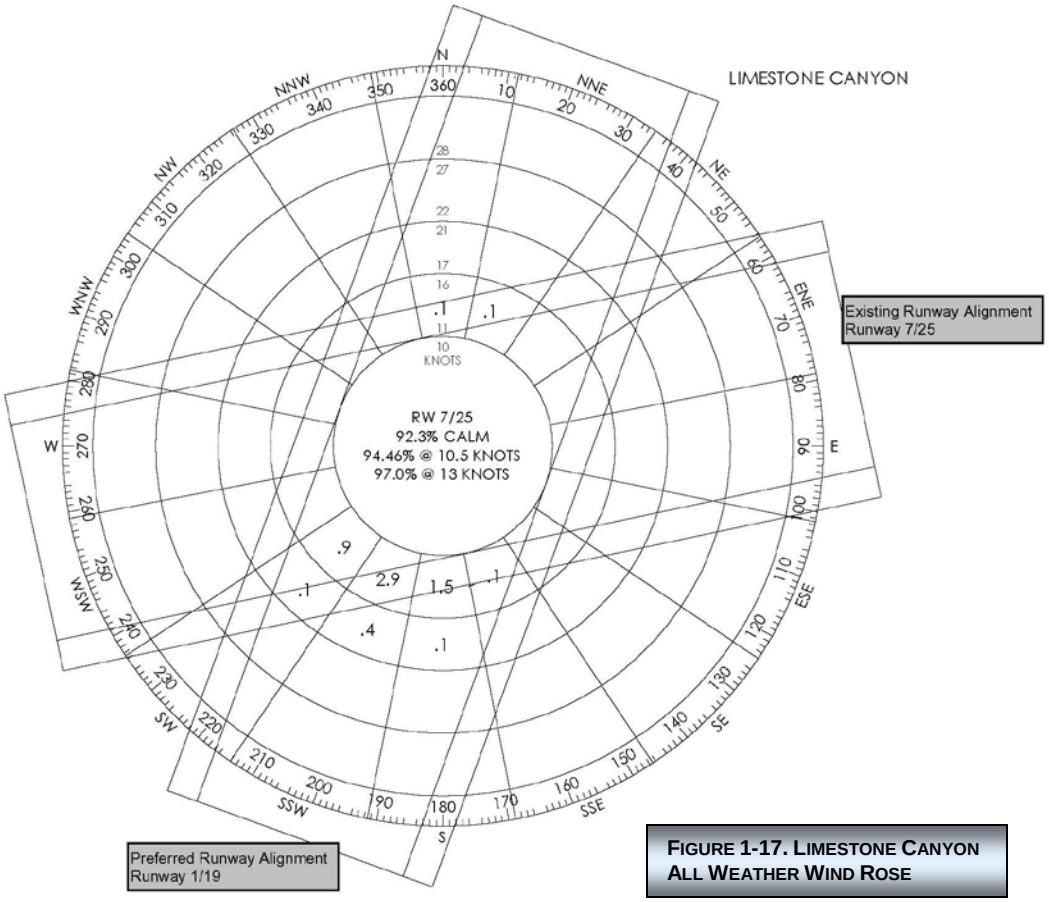


FIGURE 1-17. LIMESTONE CANYON ALL WEATHER WIND ROSE

Chapter Two
Forecasts of Aviation Activity

Cibecue Airport Master Plan

Chapter Two
Forecasts of Aviation Activity

INTRODUCTION

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement programs. While such information is necessary for successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity, based upon historical data and viewed through present situations. Therefore, they must be used with careful consideration, as they may lose their validity with the passage of time.

For this reason, an ongoing program of examination of local airport needs, as well as national and regional trends, is recommended and encouraged in order to promote the orderly development of aviation facilities for the Cibecue Airport.

At airports not served by air traffic control towers, estimates of existing aviation activity are necessary in order to form a basis for the development of realistic forecasts. Unlike towered airports, non-towered general aviation airports have historically not tracked or maintained comprehensive logs of aircraft operations. Estimates of existing aviation activity, based upon a review of based aircraft, available historical data, and regional, state, and national data form the baseline to which forecasted aviation activity trends are applied. For airports that do not currently exist or for seldom used unimproved airstrips such as the Cibecue Airport, baseline estimates need to be established for existing activity levels after completion of the improved airport.

Following the development of the airport, projections are made that incorporate established growth rates, area demographics, industry trends, and other important indicators. Forecasts are prepared for the Initial-Term (0-5 years), the Intermediate-Term (6-10 years), and the Long-Term (11-20 years) time frames. Utilizing forecasts within these time frames allows the construction of airport improvements to be timed to meet demand, and be utilized immediately.

There are four types of aircraft operations considered in the planning process. These are termed “local, based, itinerant, and transient.” They are defined as follows:

Local operations are defined as aircraft movements (departures or arrivals) for the purpose of training, pilot currency, or pleasure flying within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas, and pleasure flights that originate and terminate at the airport under study.

Based aircraft operations are defined as the total operations made by aircraft based (stored at the airport on a permanent, seasonal, or long-term basis) at the study airport, with no attempt to classify the operations as to purpose.

Itinerant operations are defined as arrivals and departure other than local operations and generally originate or terminate at another airport. These types of operations are closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes. Air tanker, reseeding, and aerial observation flights are included in this category.

Transient operations are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations.

NATIONAL AND REGIONAL TRENDS

According to factors such as aircraft production, pilot activity, and hours flown, general aviation reached a peak in the late 1970s. This peak was followed by a long downturn that persisted through most of the 1980s and the early 1990s and has been attributed to high manufacturing costs associated with product liability issues as well as other factors. Enactment of the General Aviation Revitalization Act (GARA) of 1994 was enacted with the goal of revitalizing the industry by limiting product liability costs. The Act established an 18-year statute of repose on liability related to the manufacture of all general aviation aircraft and their components. According to a 2001 report by the General Accounting Office (GAO) to Congress, trends in general aviation since GARA was enacted suggest that since the law went into effect, liability costs has been less burdensome to manufacturers, shipments of new aircraft have increased and technological advances have been made. Indicators of general aviation activity, such as the numbers of hours flown and active pilots have also increased in the years since GARA, but their growth has not been as substantial as the growth in manufacturing.

Unfortunately, the terrorist attacks of September 11, 2001 and the recent national recession have had a substantial impact on these positive general aviation industry trends. Significant restrictions were placed on general aviation flying following September 11th which resulted in a significant decrease in general aviation activity. Fortunately, most of these restrictions have now been lifted and the Federal Aviation Administration (FAA) is forecasting continued growth in general aviation.

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation, including general aviation. The FAA's most recent forecast predicts the general aviation aircraft fleet will increase at an average annual rate of 0.7 percent during the 12-year forecast period, with the number of active aircraft increasing from 211,040 in 2002 to 220,490 in 2014. The fleet of turbine aircraft is expected to increase at a greater rate than the fleet of piston aircraft; as a result, the number of piston aircraft, while continuing to increase, is expected to represent a smaller percentage of the total general aviation fleet.

Another industry trend is the continued growth in fractional ownership arrangements. Fractional ownership arrangements allow businesses and individuals to purchase an interest in an aircraft and pay for only the time that they use the aircraft. According to the National Business Aviation Association (NBAA), in 1986, there were three owners of fractionally held aircraft. By 1993, there were 110. From 2000 to 2002, the number of companies and individuals using fractional ownership grew by 52 percent, from 3,834 to 5,827 shares; the growth from 1999 (2,607) was 124 percent. The number of airplanes in fractional programs grew 11 percent in 2002, from 696 to 776. The shift toward turbine aircraft is likely a result of the success of fractional ownership, the introduction of new types of turbine aircraft, and a transition from commercial air travel to corporate/business air travel as a result of September 11th.

Yet another significant industry applicable to Cibecue is aviation used for wildland firefighting and suppression. In September of 2003, the Senate increased funds for fighting wildfires by $400 million, nearly doubling fire suppression money in a $20 billion Interior Department spending bill.

AVAILABLE ACTIVITY FORECASTS

The first step in preparing aviation forecasts is to begin with the examination of prior estimates and forecast figures. Available activity forecasts were reviewed for the Cibecue Airport, as well as the Whiteriver Airport, which is the other tribal owned and operated airport on the reservation. The FAA Terminal Area Forecasts (TAF), the FAA National Plan of Integrated Airport Systems (NPIAS), and the Arizona State Aviation Needs Study were reviewed for both the Cibecue Airport and the Whiteriver Airport. The only national forecast that included Cibecue was the January 2003 FAA TAF which forecast one based aircraft and no operations annually through 2020. The FAA TAF also forecast four based aircraft and 4,906 annual operations for the Whiteriver Airport through 2020. The FAA 2001-2005 NPIAS report forecasts based aircraft through the year 2005. The report forecasts six based aircraft for Whiteriver through the year 2005 and does not include Cibecue. The 200 Arizona Aviation Needs Study

forecasts eight based aircraft and 5,000 annual operations for the Whiteriver Airport through 2020 and does not include forecasts for the Cibecue Airport.

FAA RECORDS OF BASED AIRCRAFT AND OPERATIONS

FAA 5010-1 Form, *Airport Master Record*, is the official record kept by the Federal Aviation Administration to document airport physical conditions and other pertinent information. The record normally includes an annual estimate of aircraft activity as well as the number of based aircraft. This information is normally obtained from the airport sponsor. The accuracy of these documents varies directly with the sponsor's record keeping system.

The FAA Form 5010-1 indicates the same based aircraft and operations information as the FAA TAF of one aircraft and no operations at Cibecue and six based aircraft and 4,906 operations at Whiteriver. However, the Bureau of Indian Affairs (BIA) has indicated that based aircraft at Cibecue and Whiteriver exist seasonally during March through October, which is the typical fire-fighting season on the Fort Apache Reservation. Specifically, the BIA's helicopter contract typically runs from March 1 to July 31. The Single-Engine Air Tanker (SEAT) contract typically runs from April 1 to July 31 and the reconnaissance aircraft contract typically runs from March 1 to October 31.

DETERMINATION OF EXISTING ACTIVITY LEVELS

BASED AIRCRAFT

Historically, based aircraft have only been present at Cibecue Airport during the wildland firefighting season. It is common for a SEAT aircraft to be based at Cibecue from April 1 to July 31, and for a helicopter to be based at the airport from March 1 to July 31. For the purposes of this plan, based aircraft will refer to the aircraft that are seasonally based at the airport.

FIRE MANAGEMENT AIRCRAFT OPERATIONS

BIA Fort Apache Agency officials estimate that the annual wildfire suppression load for the western portion of the reservation is 160 fires annually. These fires primarily occur between May 1 and August 31. Helicopters are dispatched to approximately 95 percent or 152 fires annually at an average of 2.5 round trips per fire. Single Engine Air Tankers (SEATs) are dispatched to approximately 60 percent of these fires or 96 fires. Air tankers are assumed to average approximately 2 round trips per fire as some fires receive a single load of retardant while other fires will receive multiple loads. Historically, the airport has also provided both helicopter and air tanker initial attack and extended attack fire responses to adjacent federal and state lands because of the airports proximity to these lands. Past usage patterns averaged approximately 10 dispatches for both helicopters and SEATs respectively, to assist other federal agencies. During BIA fire operations in the past, such as the Rodeo-Chediski fire in 2002, as many as four SEATs and five helicopters were working out of Cibecue at one time.

AIR MEDIVAC AIRCRAFT OPERATIONS

The Town of Cibecue operates a medical clinic open from 8 a.m. to 5 p.m., serving the western portion of the Fort Apache Reservation. Indian Health Service (IHS) officials and contract air medivac and air ambulance providers estimate historical annual operations with fixed wing aircraft at approximately 200. Air Ambulance from the Cibecue Clinic is also provided via helicopter, however, these operations take place at the actual clinic, rather than the airport. However, at $6,000 per flight to Tucson or Phoenix, helicopter operations are much less efficient than fixed wing air ambulance, which typically runs about $3,500 for the same flight.

OTHER GENERAL AVIATION AIRCRAFT OPERATIONS

At the majority of general aviation airports without air traffic control towers, no records of aircraft operations exist. Aircraft fuel sales receipts often provide an accurate indicator of operations, however, fuel is not available at Cibecue Airport, making it difficult to estimate other general aviation operations. Correspondence with an air charter operator from Phoenix indicates that chartered doctor visits to the Cibecue Clinic account for approximately 50 annual operations by light twin-engine aircraft. Additional

other operations include recreational flights, business flights as well as tourism flights, as the Tribe operates a popular hunting program which attracts numerous hunters annually to the reservation.

ITINERANT AND LOCAL OPERATIONS

Itinerant operations at Cibecue Airport account for 100 percent of total operations. Although fire patrol and suppression aircraft usually do not land at other airports, their operations are considered itinerant. These aircraft do not remain in the local traffic pattern, or the vicinity of the airport. For this reason, all operations are listed as itinerant rather than local. Typical destinations range from 5 to 50 miles to attack fires throughout the western half of the reservation and surrounding areas.

TABLE 2-1 ESTIMATED ANNUAL AVIATION ACTIVITY LEVELS

	Based Aircraft	Annual Operations
Fire Management – Fixed Wing	1	415
Fire Management – Helicopter	1	800
Air Medivac – Fixed Wing		100
Other General Aviation		100
Total	2	1,415

DETERMINATION OF EXISTING DEMAND LEVELS

The activity levels listed previously indicate the level of activity at the Cibecue Airport based on existing airfield conditions (see Chapter 1). This is also known as the constrained demand level. The unconstrained demand level is the level of aviation activity that would occur if all desired airfield facilities, such as runway length, width, strength, lighting, et cetera were available.

To assist in determining the unconstrained demand level, interviews were conducted with airport users, including the BIA and air medivac contractors. According to BIA Fort Apache Agency officials, fire management operations would substantially increase if the airport were improved. The BIA would likely base a patrol plane at Cibecue during fire season to perform aerial patrol and reconnaissance flights at least once per week during the four-month fire season. The potential to use Cibecue for large air tankers is also very desirable to the BIA as the nearest large air tanker base is at Winslow, Arizona. According to the BIA, the fire risk in the Cibecue area will be increasing on an annual basis due to the Rodeo-Chediski fire of 2002, which burned over 470,000 acres of forested land immediately north of Cibecue. As these burned trees begin to fall and accumulate on the ground, the fire risk increases exponentially. This fire risk is forecasted to reach is highest level in 4-5 years creating the need for an airport in the area capable of handling large air tankers.

Interviews with officials at the Cibecue clinic and the air medivac contractors also indicated an increased demand for fixed-wing aircraft services in the airport were paved. One air medivac contractor recently decided to cease operations into Cibecue because of aircraft damage as a result of the unimproved airstrip. Another air medivac contractor based in Phoenix has not been willing to land on gravel runways since a severe accident on a gravel runway on the Navajo reservation a number of years ago. Two air medivac operators and one air charter company indicated that they would increase operations at Cibecue if the airport were paved.

The determination of existing demand was made based upon the interviews as well as information obtained during the project kickoff meeting with the Tribal Engineer and BIA Fort Apache Agency officials. It is estimated that upon improving the airport facilities and runway surfaces, two to three based aircraft can be expected at Cibecue Airport during fire season. These would include one aircraft for aerial patrol purposes, one SEAT, and one helicopter.

DEVELOPMENT OF AVIATION FORECASTS

Cibecue Airport is unique in that it serves three distinct categories of users; 1) Fire Management, 2) Air Medivac, and 3) Other General Aviation. There are no military operations at the airport. Traditional forecasting techniques cannot be applied across the board to total operations since different factors influence each category. In the following paragraphs, each category is analyzed independently to develop their respective forecasts. Fire management aircraft activity is forecast based on a linear regression trend of historical activity, with an adjustment for the addition of fire patrol and large air tanker aircraft operations. Air Medivac activity is forecasted based on a ratio of patient transports per population level. Other general aviation activity is forecasted based on a ratio of operations per population level.

FORECASTS OF FIRE MANAGEMENT AIRCRAFT ACTIVITY

Demand for fire patrol and fire suppression operations from Cibecue Airport is driven to a large amount by nature. Meteorological conditions including precipitation, temperature, winds, and lightining affect the frequency and severity of wild fires. During heavy burn seasons, more operations will be flown, and during light burn seasons, fewer operations will be flown. According to BIA Fort Apache Agency officials, the fire risk in the Cibecue area will be increasing significantly in the next couple of years and peaking in 2008, as the burned trees from the Rodeo-Chediski fire of 2002, begin to fall and accumulate on the ground. Environmental regulations prevent the removal of these trees, creating the fire hazard. Because of this increasing fire hazard and the expected increased utilization of the improved airport, SEAT fire suppression operations at Cibecue are forecast to increase at an annual rate of 15 percent through 2008, while helicopter fire suppression is expected to increase at a more modest annual rate of 8 percent during the same time period. It is also expected that after the Cibecue airport is improved, other agencies such as the U.S. Forest Service will utilize the airport for fire patrol and/or fire suppression operations.

Since it is difficult to predict the occurrence of these wild fires, fire suppression operations after 2008 are forecast to remain constant. According to information received from the BIA, It is also estimated that, upon construction of a paved runway capable of handling limited operations by large air tanker aircraft, approximately 10 to 25 landings per year, or up to 50 annual operations by these types of aircraft will take place. Also, according to the BIA, a fire patrol aircraft would operate at a paved airport in Cibecue approximately once per week during fire season, or accounting for 32 annual operations.

TABLE 2-2 FORECASTS OF FIRE MANAGEMENT AIRCRAFT OPERATIONS

	Estimated	Forecasted		
	Existing	2008	2013	2023
Fire Patrol	0	30	30	30
Fire Suppression	415	744	744	744
Helicopter	800	1,133	1,133	1,133
Large Tanker	0	50	50	50
Total	1,215	1,957	1,957	1,957

FORECASTS OF AIR MEDIVAC AIRCRAFT ACTIVITY

A combination of proximity to adequate medical facilities, age distribution of the population, and general health characteristics of the population drive the demand for air medivac service. The Cibecue Clinic, operated by the Indian Health Service (IHS) in Cibecue, provides treatment for minor injuries and stabilizes critical patients for transport. The closest hospital to Cibecue is the Whiteriver Service Unit, a 49-bed facility that provides general medical, pediatrics, and obstetric services. Information provided by Native American Air Ambulance and Air Evac Services, Inc, which provide air medivac service to Cibecue was used to estimate annual medivac operations at the Cibecue Airport.

The demand for air medivac service in 2002, as a percentage of the total population, is estimated at 6.6 percent, or a demand for roughly one medivac flight per 30 people (which equates to one medivac aircraft operation per 15 people). Social conditions on the Fort Apace Reservation, including health problems, injuries, and alcohol and drug abuse are major factors driving the demand for hospitalization and air medivac services. Considering the unfavorable socioeconomic factors discussed in Chapter 1, which

include high unemployment, low income and insufficient housing, demand for medivac service is expected to continue at a rate of at least equal to the current demand level. Population projections for the years 2008, 2013, and 2023 were applied to the demand level of one aircraft operation per 15 people to determine the forecasted number of medivac aircraft operations. The results are shown in table 2-3.

TABLE 2-3 FORECASTS OF MEDIVAC AIRCRAFT OPERATIONS

		Forecasted		
	2003	2008	2013	2023
Cibecue Population*	1,496	1,691	1,894	2,166
Medivac Operations	100	113	127	145

**Estimated based on interpolations of 2000 Arizona Department of Economic Security projections*

FORECASTS OF OTHER GENERAL AVIATION ACTIVITY

Traditional tools utilized to forecast aviation activity at general aviation airports consider the relationship between current aviation activity, population and personal income. The assumption is made that with a constant per capita income, general aviation activity will vary directly with population. In theory, when personal income increases, disposable income that is often used in acquisition and use of general aviation aircraft, also increases. However, in the case of Cibecue Airport, personal income is very low, and the local population are not the users of the airport. The airport is used by fire management services, air medivac providers, transient business, tourists, and general aviation pilots visiting the area.

The existing number of "Other General Aviation" aircraft operations are projected to increase as population increases. Population projections for the years 2008, 2013, and 2023 were applied to the demand level of one aircraft operation per 15 people to determine the forecasted number of "Other General Aviation" aircraft operations. The results are shown in Table 2-4.

TABLE 2-4 FORECASTS OF "OTHER GENERAL AVIATION" ACTIVITY

	Estimated	Forecasted		
	2003	2008	2013	2023
Cibecue Population*	1,496	1,691	1,894	2,166
Aircraft Operations	100	113	127	145

**Estimated based on interpolations of 2000 Arizona Department of Economic Security projections*

FORECASTS OF ANNUAL OPERATIONS: COMBINED – ALL USER CATEGORIES

The forecasts developed in the previous three sections for Fire Management, Air Medivac, and Other General Aviation categories were combined to arrive at the forecasts of total aircraft operations for the twenty-year planning period. The combined forecasts are depicted in Figure 2-1 and Table 2-5.

TABLE 2-5 FORECAST OF ANNUAL AIRCRAFT OPERATIONS

	Estimated	Forecast		
	2003	2008	2013	2023
Fire Management	1,215	1,957	1,957	1,957
Air Medivac	100	113	127	145
Other GA	100	113	124	145
Total	1,415	2,183	2,211	2,247

SUMMARY OF FORECASTS OF AVIATION ACTIVITY

Aviation activity at Cibecue Airport is forecast to increase at an annual rate of 11 percent during the first five years after the airport is improved. This increase is attributed to the airport being utilized, to a greater extent, for fire management activity due to its proximity to the western half of the Fort Apache Reservation. From

TABLE 2-6 FORECASTS OF AVIATION ACTIVITY

	Based Aircraft	Local Operations	Itinerant Operations	Total Operations
2003	2	0	1,415	1,415
2008	2	0	2,183	2,183
2013	3	0	2,211	2,211
2023	3	0	2,247	2,247

2008 to 2023, aviation activity at the airport is only forecast to increase at an annual rate of approximately 2 percent as other uses of the airport increase proportionately to the population increase. Only seasonal fire fighting aircraft are forecast to be based at Cibecue Airport.

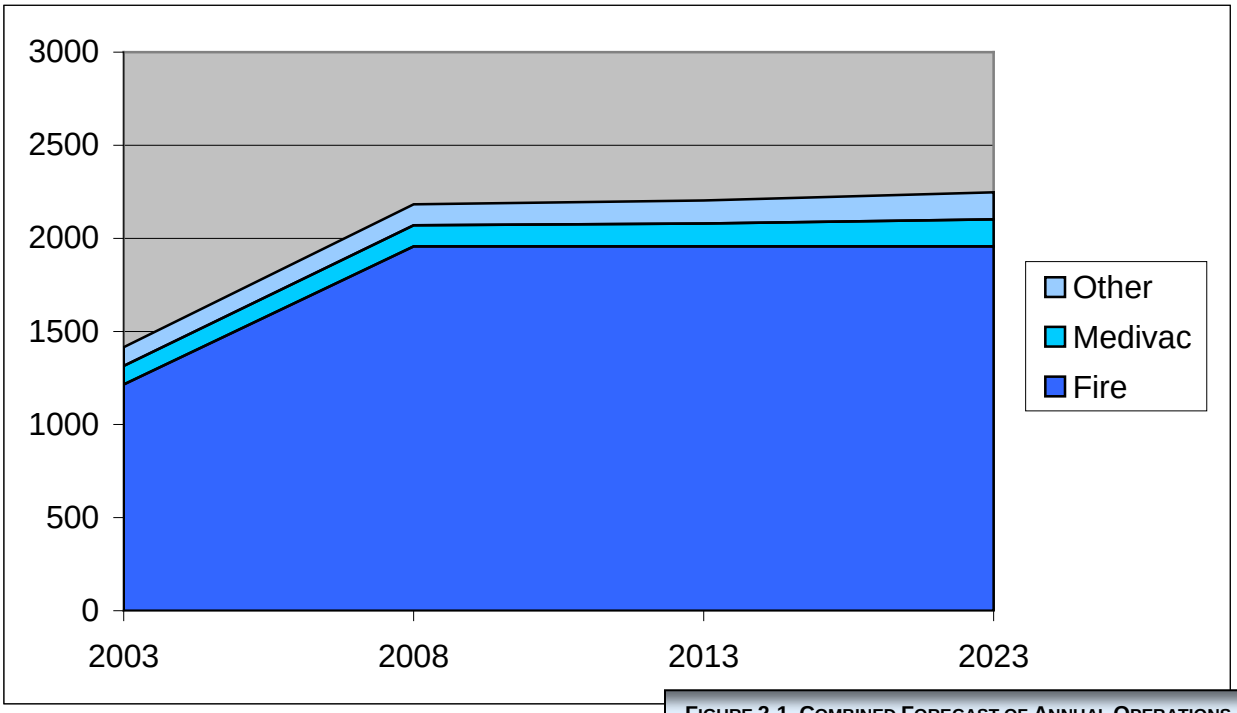


FIGURE 2-1. COMBINED FORECAST OF ANNUAL OPERATIONS

AIRPORT USERS AND FLEET MIX

The existing fleet mix at the Cibecue Airport consists of single engine piston, multi-engine piston, multi-engine turbine, and rotorcraft. Interviews with Airport Technical Advisory Committee Members indicate the following types of operations are anticipated for the Cibecue Airport:

Agriculture: Ranching and farming is one of the primary economic activities in this part of Arizona due to the vast expanse of prime ranch land. Aircraft are often used in the practice of ranching to inventory and locate livestock. Aircraft are also commonly used in agriculture for the application of pesticides and herbicides to crops.

Fire Management: The Bureau of Indian Affairs (BIA), United States Department of Agriculture (USDA), Forest Service and Bureau of Land Management (BLM) all use aircraft for a wide variety of missions, including operational personnel transport, forest rehabilitation, infrared detection, and fire prevention and suppression. The mission of the BIA Branch of Fire and Aviation Management, is to provide for firefighter and public safety as the first priority in every wildland fire management activity. The BIA provides for effective wildland fire protection, fire use and hazardous fuels management, and timely emergency rehabilitation on Indian forest and range lands held in trust by the United States of America, based on fire management plans approved by the Indian landowner. The Forest Service owns and operates 44 aircraft and contracts over 800 aircraft annually ranging from both fixed wing and helicopter. The primary mission of Forest Service Aviation is to support the ground firefighter through a variety of means including safe delivery of smokejumpers, rappellers, air attack, firefighter and cargo transport, surveillance, aerial reconnaissance and fire intelligence gathering, and aerial delivery of fire retardant and water. The BLM uses more than 60 types of government-owned or contract airplanes and helicopters to support wildland fire operations and respond to disasters. They are also used in many other programs such as habitat

management, range survey, cadastral survey, law enforcement, forest management, photo mapping, search and rescue, and other uses related to public land and resource management.

Air Medivac: Air Medivac provides essential emergency medical transport in life threatening situations. Air Medivac providers serving Cibecue utilize A-Star helicopters and Bell 206 Jet Rangers for rotorcraft transport. Aircraft used for fixed wing transport include single engine turboprop Cessna Caravans, and Pilatus PC-12s, as well as multi-engine turboprop Cessna 441s.

Medical Services: These users are physicians traveling into the airport to provide medical, vision, and auditory services at the Cibecue Clinic. These types of operations are generally conducted by single and multi-engine piston aircraft.

Business Transportation: Local and other small businesses will generally utilize single-engine and multi-engine piston aircraft. Medium sized businesses and larger corporations having a need to travel to the Cibecue would generally utilize multi-engine piston and turboprop aircraft, and light/medium business jets.

Personal Transportation: These users desire the utility and flexibility offered by general aviation aircraft. The types of aircraft utilized for personal transportation vary with individual preference and resources and generally include a mix of single-engine, multi-engine, and in some cases, turbojet aircraft.

Recreational and Tourism: These users include transient pilots flying into the region to visit recreational and tourist attractions. The users mostly utilize single engine piston aircraft; however, a small percentage may operate multi-engine piston aircraft. High-end clientele for big-game hunting often utilize turboprop and turbojet aircraft. Other types of aircraft in this category include home-built, experimental aircraft, gliders, and ultralights.

Flight Training: These users conduct local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, day and night local and cross-country flights, and simulated approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor, and Air Transport ratings. Depending on the level of interest and aircraft availability, a multi-engine rating may or may not be available. A commercial rating may be accomplished with either a single-engine or multi-engine aircraft. Air transport ratings are usually obtained at larger regional FAR Part 121 certificated flight schools.

Emergency and Weather Alternate: These users utilize all types of aircraft. Itinerant aircraft bound for nearby airports can divert to Cibecue in an emergency or if weather prevents them from reaching their destination airport.

Operations at the Cibecue Airport are predominately single-engine turboprop aircraft, specifically the Air Tractor AT-802F that is also referred to as the Single Engine Air Tanker (SEAT). Air Medicac operations utilize single-engine turboprop aircraft such as the Cessna Caravan and the Pilatus PC-12. A small number of operations consist of single engine piston and light twin piston aircraft such as the Cessna 310, 414, and 421. Fire management operations conducted by rotorcraft consist of light, medium and heavy helicopters. An example of a light helicopter (Type III) would be the Bell 206 Jet Ranger, an example of a medium helicopter (Type II) would be a Bell 204B while an example of a large helicopter (Type I) would be the Sikorsky S-64 Skycrane. Based on these types of uses, local and itinerant operations are expected to be conducted by predominately helicopter (56%) and single-engine turboprop (27%) with a small percentage of single-engine piston (6%) and multi-engine (11%) aircraft (Figure 7).

TABLE 2-7 ANNUAL AIRCRAFT OPERATIONS BY AIRCRAFT TYPE

	Fleet Mix Percentage	Operations
Single-Engine Piston	6%	90
Single-Engine Turboprop	27%	375
Multi-Engine (including turboprop & turbojet)	11%	150
Helicopter	56%	800
Total	100%	1,415

AIRPORT SEASONAL USE DETERMINATION

A seasonal fluctuation in aircraft operations may be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and at non-towered general aviation airfields. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

A substantially higher number of operations in summer months than off-season months are consistent with non-towered airports. The average seasonal use trend for FAA towered airports from the 1979-1984 records of total aircraft operations handled by tower facilities nationally (from *FAA Statistical Handbook of Aviation*) was used as a baseline for determining seasonal use trends. As discussed above, the seasonal fluctuation is more pronounced at non-towered airports than towered airports. The seasonal use trend for towered airports was adjusted to approximate seasonal use trends at non-towered airports. The Cibecue seasonal use trend was determined by averaging fire management operations over the 6-month contract fire season and applying the non-towered trend to Medivac and Other operations. These trends are presented in Table 2-8 and in Figure 2-2.

TABLE 2-8 SEASONAL USE TREND CURVES

Month	Nontowered	Cibecue
January	3.50%	0.49%
February	4.00%	0.58%
March	4.80%	14.98%
April	7.50%	15.37%
May	11.30%	15.91%
June	13.50%	16.22%
July	14.80%	16.40%
August	13.00%	16.15%
September	10.00%	1.41%
October	8.00%	1.13%
November	5.80%	0.82%
December	3.80%	0.54%

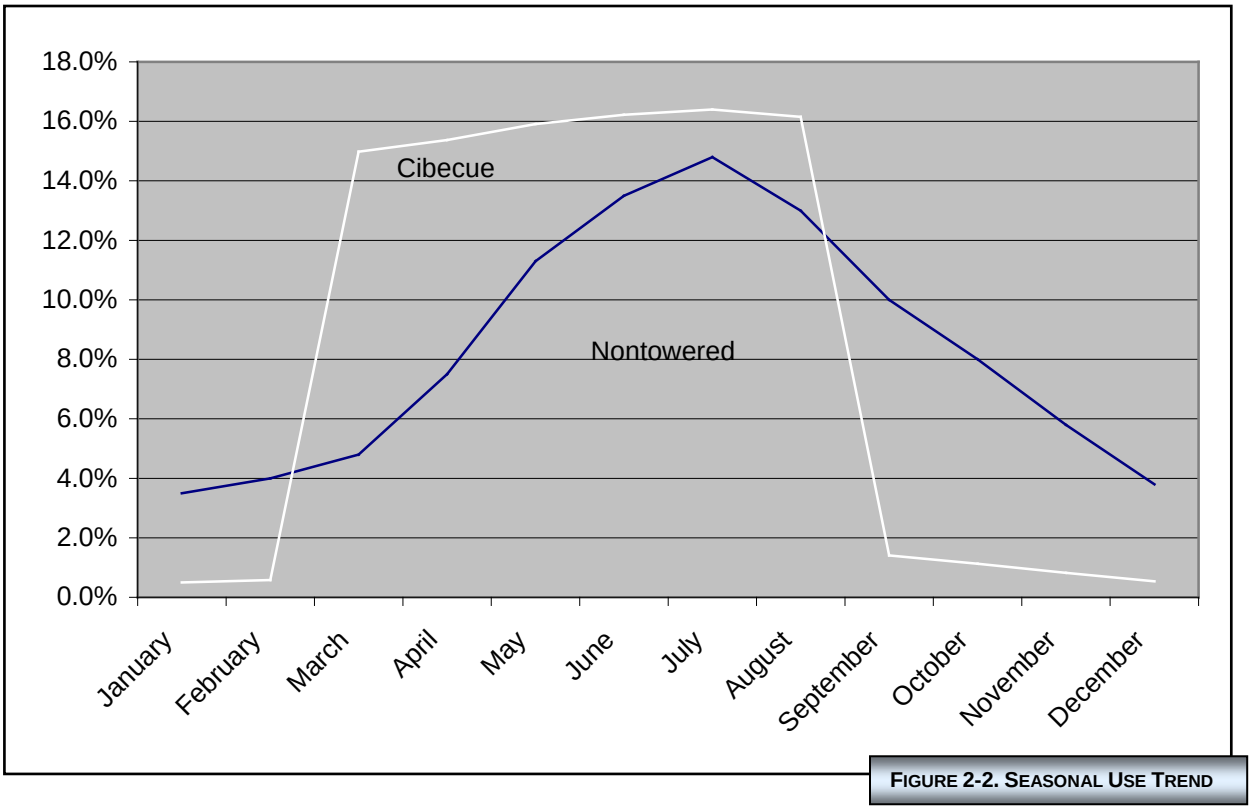


FIGURE 2-2. SEASONAL USE TREND

HOURLY DEMAND AND PEAKING TENDENCIES

In order to arrive at a reasonable estimate of actual demand at the airport facilities, it was necessary to develop a method to calculate the levels of activity during peak periods. The periods normally used in determine peaking characteristics are defined below:

Peak Month: The calendar month when peak enplanements or operations occur.
Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.
Busy Day: The busy day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.
Design Hour: The peak hour within the design day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron, and access road requirements.
Busy Hour: The peak hour within the busy day. In this case, the Busy Hour is equal to the Design Hour.
The Seasonal Use Trend Curve, as presented in Table 2-8, was used as a tool to determine the peaking characteristics for the Cibecue Airport. Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

$$M = A (T / 100)$$
$$D = M / (365 / 12)$$

Where T = Monthly percent of use (from curve)
M = Average monthly operations
A = Total annual operations
D = Average Daily Operations in a given month

Experience has shown that approximately 90% of total daily operations will occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, and that the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period. The Estimated Peak Hourly Demand (P) in a given month was, therefore, determined by compressing 90% of the Average Daily Operations (D) in a given month into the 12-hour peak use period, reducing that number to an hourly average for the peak use period, and increasing the result by 50% as follows:

$$P = 1.5 (0.90D / 12)$$

Where D = Average Daily Operations in a given month.
P = Peak Hourly Demand in a given month.

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in Table 2-9. As is evident in the Table, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of July (highlighted in bold in each Table), with 12 daily operations and approximately 1.4 operations per hour in 2023.

TABLE 2-9 ESTIMATED HOURLY DEMAND PER MONTH

Planning Year: 2003 Operations: 1,415					Planning Year: 2023 Operations: 2,183				
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	0.5	7	0	0.0	January	0.5	11	0	0.0
February	0.6	8	0	0.0	February	0.6	13	0	0.0
March	15.0	212	7	0.8	March	15.0	327	11	1.2
April	15.4	217	7	0.8	April	15.4	336	11	1.2
May	15.9	225	7	0.8	May	15.9	347	11	1.2
June	16.2	230	8	0.9	June	16.2	354	12	1.4
July	**16.4**	**232**	**8**	**0.9**	**July**	**16.4**	**358**	**12**	**1.4**
August	16.2	229	8	0.9	August	16.2	353	12	1.4
September	1.4	20	1	0.1	September	1.4	31	1	0.1
October	1.1	16	1	0.1	October	1.1	25	1	0.1
November	0.8	12	0	0.0	November	0.8	18	1	0.1
December	0.5	8	0	0.0	December	0.5	12	0	0.0

REFINED SEASONAL USE DETERMINATION

Some airport facilities at the Cibecue Airport should be planned and designed based on the ultimate wildland fire situation rather than seasonal use. The Rodeo-Chedski fire of 2002 provides a good estimate of this ultimate wildland fire situation as the 470,000-acre fire was estimated as the largest in Arizona history. According to the BIA, four Single Engine Air Tankers and five helicopters were operating out of Cibecue Airport during this fire. According to BIA and White Mountain Apache Tribal officials, if the Cibecue Airport had been paved during the Rodeo-Chedshi fire, up to six Single Engine Air Tankers would likely have utilized the airport at one time. This situation of eleven aircraft operating simultaneously at Cibecue should be considered the peak hour within the busy day, or the Design Day and Design Hour peak demand.

Chapter Three
Facility Requirements

Cibecue Airport Master Plan

Chapter Three
Facility Requirements

INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize Cibecue Airport. Fundamental development is the basic configuration recommended for an airport in the National Plan of Integrated Systems (NPIAS) and is affected by the type, but generally not the amount, of activity that the airport will serve. The type of activity is generally described by the Airport Reference Code (ARC). Fundamental development includes, but is not limited to, land acquisition, aircraft movement areas, landing and navigation aids, and airport access roads. Demand-based development items are those facilities that are designed to accommodate the volume of traffic the airport serves. Demand based development items include, but are not limited to, aircraft parking aprons, hangars, fuel storage and dispensing, and automobile parking.

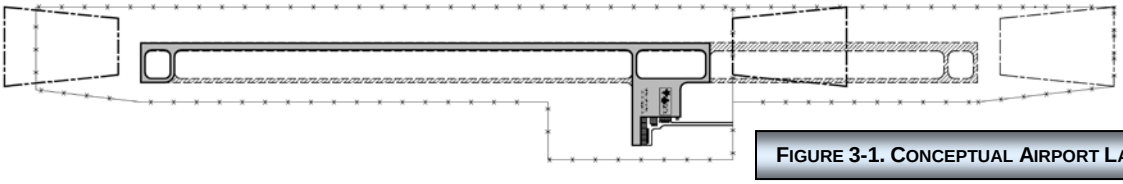


FIGURE 3-1. CONCEPTUAL AIRPORT LAYOUT

The size and configuration required for each of the fundamental and demand based airport development items will be identified in this Chapter. Table 3-1 lists the fundamental airport development items and associated comments according to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems.*

TABLE 3-1 FUNDAMENTAL AIRPORT DEVELOPMENT ITEMS

Development Item	Comment
Land	Airfield development, building area, runway protection zones, approach aids, compatible land uses in accordance with current criteria.
Single Runway	
Crosswind Runway	Recommended if main runway wind coverage is less than 95%.
Lighting	Type of lighting for runway is dependent on the airport and type of approach.
Full Parallel Taxiway	
Visual Glide Slope Indicator (VGSI)	
Runway End Identification Lights (REIL)	If runway is approved for night operations and is lighted, it may qualify for a REIL.
Runway Marking	Marking as necessary to support applicable approach.
Apron	To accommodate based and transient aircraft.
Runway Grooving, as appropriate	
Instrument Approach, as appropriate	Satellite navigation will be able to support instrument. approaches to virtually all runway ends, dependent on satellite signal availability.
Rotating Beacon	Not required unless the airport is approved for night operations or has a published instrument approach.
Wind Cone and Segmented Circle	Wind cone lighted if airport approved for night operations.
Obstruction Lighting and Marking	Where necessary
Access and Service Roads	In accordance with Order 5100.17 (paragraph 122)
Perimeter Fencing	

Source: FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems

AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and correlates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. Table 3-2 has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. Figure 3-2 shows examples of aircraft and their Airport Reference Codes.

TABLE 3-2
AIRCRAFT APPROACH CATEGORIES AND DESIGN GROUPS

AIRCRAFT APPROACH CATEGORY: An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 times the stall speed of the aircraft at the maximum certificated landing weight.

Aircraft Category	Approach Speed
Category A	Speed less than 91 knots
Category B	91 knots or more but less than 121 knots
Category C	121 knots or more but less than 141 knots
Category D	141 knots or more but less than 166 knots
Category E	166 knots or more

AIRCRAFT DESIGN GROUP: The aircraft design group subdivides aircraft by wingspan. The aircraft design group concept links an airport's dimensional standards to aircraft approach categories or to aircraft design groups or to runway instrumentation configurations. The aircraft design groups are:

Design Group	Aircraft Wingspan
Group I	Up to but not including 49 feet
Group II	49 feet up to but not including 79 feet
Group III	79 feet up to but not including 118 feet
Group IV	118 feet up to but not including 171 feet
Group V	171 feet up to but not including 214 feet
Group VI	214 feet up to but not including 262 feet

Source: FAA Advisory Circular 150/5300-13, Airport Design

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations. According to information provided by the Airport Technical Advisory Committee (ATAC), aircraft currently using the airport include the Pilatus PC-10 and the Cessna Caravan for medical evacuation and transport operations to and from the Cibecue Medical Clinic. The typical fire-fighting aircraft currently using Cibecue airport include the Air Tractor line of Single Engine Air Tankers (SEATs) as well as Type III light helicopters such as the Bell 206 JetRanger. The Air Tractor 802F aircraft has an ARC of B-II. Also, fire patrol and air attack missions are flown by contractors utilizing piston twin Cessna aircraft including the Cessna 310, 414 and 421. These aircraft have an ARC of B-I. Information obtained from the ATAC also indicated the need for a facility to occasionally serve Type I or II large air tanker aircraft. The Lockheed P-3 Orion is an example of a Type II air tanker having an ARC of C-III. Additionally, some A-I, B-I and B-II aircraft operations are anticipated after the airport is improved. Airport users and fleet mix were discussed in Chapter 2. Examples of aircraft with an ARC of A-I and B-I are listed in Table 3-3, while examples of aircraft with and ARC of A-II and B-II are listed in Table 3-4. This information indicates that fundamental development items should be based on an Airport Reference Code of B-II. Airport pavement sections should be designed to accommodate aircraft weighing 16,000 lbs or less as this is the maximum takeoff weight of the design aircraft, the AT 802F. According to the BIA Fort Apache Agency, the need for a large aircraft tanker base is such that a facility designed to an ARC of B-II with increased pavement strength of greater than 16,000 lbs should be considered.

AI

Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI

Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII

(<12,500 lbs) Primarily Light Turboprops

Example Type: Beechcraft King Air

BII

(>12,500 lbs) Mid-sized corporate jets and commuter airliners

Example Type: Cessna Citation II

A/ BIII

Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI

Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII

Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/ DIII

Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/ DIV

Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV

Jumbo commercial airliners (approx. 350+ seats)

FIGURE 3-2. TYPICAL AIRCRAFT REFERENCE CODES

TABLE 3-3 EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	6,200
Beech Bonanza V35B	70	33.5	3,400
Beech King Air B100	111	45.9	11,799
Cessna 150	55	33.3	1,670
Cessna 172	60	36.0	2,200
Cessna 177	64	35.5	2,500
Cessna 182	64	36.0	2,950
Cessna 340	92	38.1	5,990
Cessna 414	94	44.1	6,750
Cessna Citation I	108	47.1	11,850
Gates Learjet 28/29	120	42.2	15,000
Mitsubishi MU-2	119	39.1	10,800
Piper Archer II	86	35.0	2,500
Piper Cheyenne	110	47.6	12,050
Rockwell Sabre 40	120	44.4	18,650
Swearingen Merlin	105	46.3	12,500
Raytheon Beechjet	105	43.5	16,100

Source: FAA AC 150/5300-13, Airport Design

TABLE 3-4 EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	16,000
Beech King C90-1	100	50.3	9,650
Beech super King Air B200	103	54.5	12,500
Cessna 441	100	49.3	9,925
Cessna Citation II	108	51.6	13,300
Cessna Citation III	114	50.6	17,000
Dassault Falcon 50	113	61.9	37,480
Dassault Falcon 200	114	53.5	30,650
Dassault Falcon 900	100	63.4	45,500
DHC-6 Twin Otter	75	65.0	12,500
Grumman Gulfstream I	113	78.5	35,100
Pilatus PC-12	85	52.3	9,920

Source: FAA AC 150/5300-13, Airport Design

AIRSIDE FACILITY REQUIREMENTS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area, and any visual or electronic approach aids.

RUNWAY REQUIREMENTS

Annual Service Volume: The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions, and aircraft mix that would be encountered in a year's time. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

The FAA Airport Design Program was used to calculate the Annual Service Volume for a single runway airport with the forecasted operation levels determined in Chapter 2. Annual Service Volume for single

runway configuration is 230,000 operations per year. Under these conditions, a single runway facility will adequately meet the capacity demand within the time frame of this study.

Demand/Capacity: The methodology for computing the relationship between an airport's demand versus its capacity is contained in FAA AC 150/5060-5.

To facilitate this comparison, computations were made to determine the hourly capacity of a single runway configuration in Visual Flight Rules (VFR) and in Instrument Flight Rules (IFR). The calculations were made using the assumptions recommended in the Advisory Circular for the particular airport layout and conditions, combined with the forecast operational data generated with this study. The following is a tabulation of the physical aspects of the four aircraft classes (not to be confused with the aircraft approach categories discussed earlier), as considered in the capacity computations.

TABLE 3-5 FAA AIRCRAFT CLASSIFICATIONS FOR CAPACITY CONSIDERATIONS

Class	Maximum Takeoff Weight	Engines
A	12,500 lbs. or less	Single Engine
B	12,500 lbs. or less	Multi Engine
C	12,500 to 300,000 lbs.	Multi Engine
D	Over 300,000 lbs.	Multi Engine

Existing operations at the Cibecue Airport occur only during visual meteorological conditions. During this time, approximately 90% of the operations were by Class B aircraft. For ultimate conditions, this percentage is expected to remain constant. No airspace limitations exist which would affect runway use. In all calculations, it is assumed that arrivals equal departures, and that no "touch-and-go" activity is currently taking place at the airport.

TABLE 3-6 HOURLY CAPACITY – OPERATIONS PER HOUR (2023)

	VFR	IFR
Single Runway	55	53

Runway Capacity: Using the above conditions and applying them to the Hourly Capacity charts in the Advisory Circular, the average peak capacities for a single runway configuration were determined as shown in Figure 3-6.

Runway Length: The FAA has developed a computer software program entitled "Airport Design." The program provides the user with recommended runway lengths and other facilities on an airport according to certain criteria. The information, which is required to execute the program for recommended runway lengths, includes airfield elevation, mean maximum temperature of the hottest month, and the effective gradient for the runway. This specific information for the existing Cibecue Airport was used for the purposes of this portion of the study:

Field Elevation: 5,050' MSL
Mean Maximum Temperature of Hottest Month: 91.3° F
Effective Gradient: 90 Feet

(Note: The actual difference in feet from runway end to runway end is required to run the FAA software program and is listed as the effective gradient. However, the effective gradient is usually shown as a percent.)

With this data, the Airport Design program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the data provided by the program is listed in Table 3-7.

Using only the results of the FAA's software program, it would be fair to suggest that the runway should have a minimum length of 4,670 feet. This would accommodate 75 percent of the small aircraft fleet. A length of 6,450 feet would accommodate 100 percent of the small aircraft fleet. However, it is important to identify the runway length requirements for the specific aircraft that are expected to operate at the airport.

TABLE 3-7 RECOMMENDED RUNWAY LENGTH

Description	Runway Length
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	4,670’
95 percent of these small airplanes	6,280’
100 percent of these small airplanes	6,450’
10 or more passenger seats	6,450’
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	7,640’
75 percent of these planes at 90 percent useful load	9,500’
100 percent of these planes at 60 percent useful load	11,900’
100 percent of these planes at 90 percent useful load	11,900’

Source: FAA Computer Software Program, Airport Design Version 4.2d

Takeoff Distance Requirements: When determining runway length requirements for any airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. Table 3-8 gives examples of takeoff distance requirements for the aircraft currently using the Cibecue Airport and those that could be expected to use airport in the future. Table 3-9 gives examples of takeoff distance requirements for air tanker aircraft expected to use the Cibecue Airport.

TABLE 3-8 PERFORMANCE CHARACTERISTICS FOR AIRCRAFT

Aircraft	Airport Reference Code	Takeoff Weight (pounds)	Required Runway Length (feet)
Cessna 172	A-I	2,400	1,510
Cessna 182	A-I	2,950	2,740
Piper PA-28 Turbo Arrow	A-I	2,900	3,200
Cessna 310R	B-I	5,500	6,034
Cessna 414	B-I	6,750	5,693
Cessna 421C	B-I	7,450	4,877
Cessna Citation I/SP	B-I	11,850	4,390
Beech Baron 58	B-I	5,500	2,600
Pilatus PC-12	A-II	9,920	4,796
Cessna Caravan	A-II	8,000	4,378
Raytheon King Air C90	B-II	9,650	4,600
Raytheon King Air B200	B-II	12,500	3,100
Learjet 31A	B-I	16.500	6,400

Aircraft performance data based on a mean maximum temperature of the hottest month of 91.3° F and an airport elevation of 5,050 feet mean sea level (MSL). Density altitude was computed at 8,000 feet MSL.

TABLE 4-9 PERFORMANCE CHARACTERISTICS FOR AIR TANKERS

Aircraft	Airport Reference Code	Contract Operating Weight (pounds)	Required Runway Length (feet)
Air Tractor 802F	B-II	16,000	5,070*
Lockheed P3 Orion	C-III	97,000	7,182
Lockheed C-130	C-IV	108,550	5,573

Aircraft performance data based on a mean maximum temperature of the hottest month of 91.3° F and an airport elevation of 5,050 feet mean sea level (MSL). Density altitude was computed at 8,000 feet MSL.
**Runway length requirements are not available for the AT-802F, the 5,070 feet requirement is based on the AT 802A takeoff distance to 50 feet, at a maximum takeoff weight of 12,500lbs.*

Based on the required runway lengths for these categories of aircraft, a runway length of 5,100 feet is recommended for the initial development phase. For planning purposes, a future runway length of 7,640 feet, as determined by the FAA Airport Design Program, is recommended. This will accommodate 75

percent of the small aircraft fleet in the short-term, and in the long-term would accommodate 100 percent of the small aircraft fleet and 75 percent of large aircraft at 60 percent useful load.

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. In the short-term, the strength of the runway should be a minimum of 16,000 pounds Single Wheel Gear (SWG) to accommodate the Air Tractor 802F. A runway strength of 100,000 pound Dual Wheel Gear (DWG) would be needed to accommodate large air tankers.

FAA design standards for runways serving aircraft having an ARC of A-I or B-I require a minimum runway width of 60 feet. Runway serving aircraft with at ARC of A-II or B-II require a minimum width of 75 feet. Because the design aircraft, the Air Tractor 802F, has an ARC of A-II, the runway at Cibecue should be constructed to a width of 75 feet.

CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered.

The wind study analysis described in Chapter 1, indicated that the existing Cibecue airport does meet the FAA standard of at least 95 percent crosswind coverage for the Cibecue station data, but not the Limestone station data. However, the study determined that based on wind data from both stations, as well as wind observations by airport users, that a runway alignment of 1/19 would be preferred.

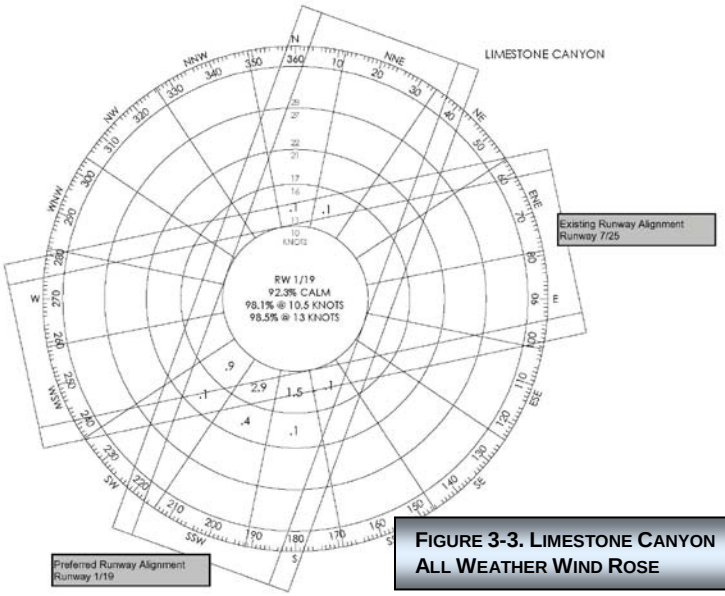


FIGURE 3-3. LIMESTONE CANYON ALL WEATHER WIND ROSE

TAXIWAY REQUIREMENTS

Length and Width: The construction of parallel taxiways is considered essential at airports that have at least 20,000 annual operations, and is recommended for airports serving aircraft weighing more than 12,500 pounds. Based on this recommendation and the aviation forecasts developed in Chapter 2, the airport will not require a full-length parallel taxiway in the short-term, but should be considered in the long-term for safety purposes. During the firefighting season at peak operating hours, a full-length parallel taxiway would allow for a more efficient flow of air tanker traffic. Bypass taxiways should initially be constructed at both runway ends at a width of 35 feet with hold lines located a minimum of 200 feet from the runway centerline. Stub taxiways will be needed to connect the aircraft-parking apron to the runway.

Strength: The strength of the taxiway should be maintained at a strength equal to that of the primary runway pavement.

HELIPAD REQUIREMENTS

The sponsor should consider developing separate helicopter facilities at the Cibecue Airport. Rotor wash likely has a significant detrimental impact at the airport due to the arid climate and subsequent lack of vegetation. It is recommended that either a helicopter Touchdown and Lift-Off Area/Final Approach and Take-Off are (TLOF/FATO) facility or just a helicopter parking facility be considered. If it is decided that only parking facilities for helicopters are to be considered, taxiway access from this parking area to the

runway should be provided. A minimum of four helicopter-parking pads would be required to accommodate the peak hour fire fighting activities.

NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs), and Tactical Air Navigational Aids (TACANs), as examples.

Although NAVAIDs provide important information to approaching, departing, and enroute pilots, installation of a ground based NAVAID at the airport is not recommended. The FAA is phasing out all ground based navigational equipment. For these reasons, the airport should plan for a future nonprecision instrument Global Positioning System (GPS) approach.

Nonprecision GPS approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation allowing remote installation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use, and is now available for civilian use. GPS approaches are rapidly being commissioned at airports across the United States. Approach minimums as low as 300-foot ceilings and one-mile visibility are typical for this type of approach. An instrument approach will increase the utility of the airport by providing for the capability to operate in inclement weather conditions. This is especially important for air medivac and physician transport flights.

AIRFIELD LIGHTING, SIGNAGE, AND MARKING

Medium Intensity Runway Lights (MIRLs) or a retro-reflective identification system are required for nighttime aircraft operations and for airports with instrument approaches. If lighting is used the lighting system should incorporate electrical conduit and duct. This will protect the electrical cables, extend the life of the system, and reduce the potential of electrical failures in the runway lighting system. The lighting should be pilot controlled which is activated by clicks of the aircraft microphone. If retro-reflectors are used, the only electrical requirements would be for the 4 light approach lighting system which is recommended for use with the retro-reflective system. The bypass taxiways and parking apron should also be equipped with retro-reflective markers.

A standard rotating beacon should be installed which will meet the FAA standards in Advisory Circular 150/5345-12C, *Specification for Airport and Heliport Beacon*.

Apron area lighting should be provided to enhance safety and security in the aircraft-operating environment. Automated controls such as timers, motion sensors, or radio controllers may be used to minimize operating costs. The runway should be marked with nonprecision instrument markings to coincide with the anticipated GPS nonprecision instrument approach.

VISUAL AIDS

Vertical Glide Slope Indicators (VGSIs) are recommended for both runway ends of the primary runway. The current technology is a Precision Approach Path Indicator (PAPI). PAPIs provide visual descent guidance information during the approach to the runway. The PAPIs consist of either two or four light units located to the left of the runway and perpendicular to the runway centerline. If the aircraft is above the glide path, the pilot will see all white lights. If the pilot is on the proper glide path, the light units closest to the runway will be red and those farthest from the runway centerline will be white. When the pilot is below the glide path all of the light units will be red. PAPIs have an effective visual range of approximately five miles during the day and up to twenty miles at night. These visual aids are extremely useful in situations where there are few visual references surrounding the airport, especially at night. Runway End Identifier Lights (REILs) are synchronized flashing lights located laterally on each side of the runway threshold. They provide rapid and positive identification of the threshold of a runway and are especially useful when other lighting in the vicinity of the airport makes it difficult to distinguish the runway lights. Because of the remote location of the airport, REILs are not recommended.

AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways, and proximity to all aircraft expected to use the airport, including turboprops and business jets.

Tiedown Requirements: Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient and based aircraft during a major fire. Tiedown requirements for the 20-year planning period are listed in Table 3-10.

Apron Requirements: Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation, and fuel truck movement.

TABLE 3-10 APRON AND TIEDOWN REQUIREMENTS

Year	Based Aircraft	Based Aircraft Tiedowns	Transient Aircraft Tiedowns	Total Tiedowns Required	Parking Apron S.Y. Required
2003	2	0	0	4	1,320
2008	2	2	3	5	1,680
2013	3	2	3	6	1,980
2018	3	2	4	7	2,340
2023	3	2	4	7	2,340

Hangared based aircraft reduce the requirement for based aircraft tiedowns.

Helicopter Parking Requirements: Helicopter parking should be provided based on expected helicopter Types. As stated in Chapter 2, Type I, II and III helicopters are expected to utilize the airport. A parking apron similar to the one being considered for Whiteriver Airport providing two Type I pads and two Type III pads is recommended for Cibecue Airport.

LANDSIDE FACILITY REQUIREMENTS

Landside facilities are an equally important aspect of the airport. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport.

TERMINAL BUILDING

The construction of a terminal building at any airport offers many amenities to passengers, local and transient pilots, and airport management. Terminal buildings (often called pilot lounges at general aviation airports) most often house public restrooms, public telephones, a pilot's lounge, and information regarding airport services. At general aviation airports with minimal passenger throughput, the Fixed Base Operator (FBO) facility often provides many of the services listed above. A terminal building is normally not warranted if the FBO fulfills these functions.

In the case of Cibecue Airport, a pilot's lounge should be constructed along with restrooms, vending machines, and a pay telephone. Passenger throughput is not significant to warrant a separate terminal building. However, the possibility of utilizing Cibecue Airport as a firefighter base camp would warrant a terminal facility. The future operation of an FBO may incorporate these facilities with their office and hangar area.

HANGAR FACILITIES

Hangars are typically classified as either T-Hangars, small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit, or Conventional hangars, small to very large units, which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each

conventional hangar can hold varies according to the manufacturer and the specifications of the airport owner or operators.

Based Aircraft Hangar Requirements: Future facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars, and number of conventional type hangars required. The forecast of based aircraft in Chapter 2 estimates 3 aircraft based at the airport by the year 2023. Exposing aircraft to the heat and sun as well as precipitation and cold can have a damaging effect. Planning for future hangars should include a mix of T-hangars at least one individual conventional hangar.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter. A hangar that accommodates four small single-engine or two twin-engine aircraft should be considered for the long-term time frame.

General: It is recommended that the airport sponsor not provide financing to construct hangars, since airside development should be considered a higher priority for local funding. The airport sponsor should provide long-term land leases to interested parties for the construction of aircraft storage hangars. Allowing the tenant to retain ownership of the hangar while leasing the ground reduces capital outlay requirements for the White Mountain Apache Tribe, and provides motivation for the tenant to maintain the hangar in good condition to maximize resale value at the end of the lease period. The existing BIA fire management contractor could be interested in this type of arrangement. The sponsor should also charge a standard tiedown fee for use of the open apron space.

AVIATION FUEL FACILITIES

Airport operations are not sufficient to justify fuel storage at the airport. Fire management contractors supply their own fuel for aircraft operations. Fuel storage requirements at Cibecue Airport are difficult to estimate. The existing primary fuel demand at the airport is for Jet fuel because the majority of the aircraft are turbine powered. The current Single Engine Air Tanker (SEAT) contractor locates a 2000-gallon Jet A fuel truck at the airport during fire season. The sponsor should also consider charging a fuel flowage fee for each gallon of fuel dispensed at the airport.

VEHICLE PARKING

It is recommended that the airport provide adequate automobile parking to accommodate pilots, employees, visitors, and passengers. Peak hour demand estimates were developed in Chapter 2 and were used to determine vehicle-parking requirements. The peak hour estimates of 4 SEAT aircraft and 5 helicopters would require a minimum of 10 vehicle parking spaces.

FENCING

A perimeter fence located outside of the Runway Object Free Area or Building Restriction Line should protect the airport property. For Cibecue Airport this fence should be constructed of barbed wire with wire mesh and steel posts capable of deterring horses and cattle. It is also recommended that the Airport Sponsor maintain a chain link fence constructed between the automobile parking/public areas and the aircraft movement areas. This enhances safety and security by protecting against inadvertent access by the general public.

AIRPORT RESCUE AND FIRE FIGHTING (ARFF) EQUIPMENT & STORAGE BUILDING

Airport Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with aircraft having more than 30 passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided for nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire, or hazardous material (fuel) spill. The level of protection recommended in FAA Advisory Circular 150/5210-6C, *Aircraft Fire and*

Rescue Facilities and Extinguisher Agents, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilities should be provided to store any ARFF vehicle(s) or equipment that is acquired.

SNOW REMOVAL EQUIPMENT & STORAGE BUILDING

Based on the average annual snowfall of 18.5 inches, presented in Chapter 1, snow removal equipment will be required to keep the airport operational during the winter months. Snow removal equipment requirements consist of a powered broom and equipment to pull the broom. Also, adequate facilities should be provided to store any snow removal equipment.

UTILITIES

Basic utility services including water and power, phone, either sewer, septic or vault toilet, and either natural gas or propane should be made available at the airport. Power will be required to operate the airfield lighting, visual aids, and private hangars.

WEATHER REPORTING

It is recommended that either an Automated Weather Observation System (AWOS) or an Automated Unicom be provided to advise pilots of local weather conditions. An AWOS utilizes various sensors, a voice synthesizer, and a radio transmitter to provide real-time weather data. These transmissions provide wind data, temperature, dew point, visibility, and ceiling data up to 25 nautical miles from the site. The system information is updated every minute. An Automated Unicom provides the same information as the AWOS, with the exception of ceiling height, but also provides traffic advisories and radio checks as traffic permits.

LAND USE COMPATIBILITY AND CONTROL

ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the FAR Part 77 Imaginary Surfaces (described in Chapter 1). The FAA therefore recommends that all Airport Sponsors implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces.

COMPATIBLE LAND USE

In addition to ensuring that the Part 77 Surfaces are free from current and future obstructions, it is recommended that the Airport Sponsor make every effort to eliminate all incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractant On or Near Airports*, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and waste water treatment plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for an airport in Cibecue are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in Table 3-11. A conceptual layout diagram of these facilities is shown on the front page of this Chapter in Figure 3-1.

TABLE 3-11 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

Facility		Short-Term (0-5 years)	Long-Term (6-20 years)
Runway			
	Length (feet)	5,100	7,640
	Width (feet)	75	75
	Strength (pounds)	16,000	30,000
Taxiways			
	Parallel	No	Partial
	Bypass Taxiways	Yes	Yes
	Width (feet)	35	35
	Strength (pounds)	16,000 (SWG)	Up to 100,000 (DWG)
Apron			
	Tie Downs	4	7
	Helicopter Parking Pads	4	4
NAVAID			
	Approaches (GPS)	Nonprecision	Nonprecision
Lighting & Visual Aids			
	Runway Edge	Retro-reflective	MIRL
	Taxiway/Apron Edge	Retro-reflective	Retro-reflective
	REILs	No	No
	Approach Slope Indicator	PAPI-2	PAPI-2
	Segmented Circle/Wind Cone/Beacon	Yes	Yes
	Rotating Beacon	Yes	Yes
Access & Parking			
	Automobile	10	10
Hangar Facilities			
	T-Hangars	2	2
	Conventional-Small	0	1
	Conventional-Medium/Large	0	0
Fuel Storage			
	100 LL (gallons)	None	None
	Jet-A (gallons)	None*	None*
	Fuel Service	None	None
Other			
	Unicom	Automated	Automated

**Supplied by Fire Management Contractor*

FAA SAFETY AND DESIGN STANDARDS

As previously discussed, the Airport Reference Coding (ARC) system is used to relate airport design criteria to the operational and physical characteristics of the critical aircraft intended to operate at the airport. FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, establishes design standards for airports based on its ARC.

SAFETY AREAS

Runway and Taxiway Safety Areas (RSAs and TSAs) are a defined surface surrounding the runway or taxiway prepared specifically to reduce the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations;

- Drained so as to prevent water accumulation;
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

OBSTACLE FREE ZONE (OFZ) AND OBJECT FREE AREAS (OFA)

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition from ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function.

The Runway OFZ is similar to the FAR Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway. It extends 200 feet beyond the end of each runway.

The Runway Object Free Area (OFA) is a two dimensional ground area surrounding the runway. The runway OFA standard precludes parked airplanes, agricultural operations, and objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

RUNWAY PROTECTION ZONES (RPZ)

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. It begins at the end of the area usable for takeoff or landing on an unpaved runway and 200 feet from the area usable for takeoff or landing on a paved runway. The RPZ dimensions are functions of the design aircraft, type of operation, and visibility minimums.

While it is desirable to clear all objects from the RPZ, uses such as agricultural operations (provided they do not attract birds) and golf courses are normally acceptable. Land uses that are prohibited from the RPZ include residences and places of public assembly such as churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of people.

THRESHOLD SITING SURFACE

According to FAA AC 150/5300-13, the runway threshold should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object obstructs the airspace required for landing airplanes is beyond the airport owner's power to remove, relocate, or lower. Thresholds may also be displaced for environmental considerations such as noise abatement, or to provide the standard RSA and OFA lengths.

SUMMARY OF DIMENSIONAL CRITERIA

Table 3-12 summarizes the dimensional standards described above for the recommended airport facilities described in this section.

TABLE 3-12 SUMMARY OF DIMENSIONAL CRITERIA

Design Criteria	Initial	Future
Airport Reference Code	B-II	B-II
Approach Type	Visual>Utility	Nonprecision>Utility
Approach Minimums	1 mile	1 mile
FAA Airport Design Standards (AC 150/5300-13, Change 6)		
Runway centerline to parallel taxiway centerline	*240'	*240'
Runway centerline to edge of aircraft parking apron	*250'	*250'
Runway width	75'	75'
Runway shoulder width	10'	10'
Runway Safety Area width	150'	150'
Runway Safety Area length beyond runway end	300'	300'
Runway Object Free Area width	500'	500'
Runway Object Free Area length beyond runway end	300'	300'
Runway Obstacle Free Zone width	400'	400'
Runway Obstacle Free Zone length beyond runway end	200'	200'
Runway Protection Zone	500'x700'x1,000'	500'x700'x1,000'
Taxiway width	35'	35'
Taxiway Safety Area width	79'	79'
Taxiway Object Free Area width	131'	131'
Taxilane Object Free Area width	115'	115'
Runway centerline to aircraft hold lines	200'	200'
Threshold Siting Surface slope	20:1	20:1
Threshold Siting Surface dimensions	400'X1,000'X1,500' plus 8,500'	400'X1,000'X1,500' plus 8,500'
Airspace Surfaces (Part 77)		
Primary Surface width	500'	500'
Primary Surface length beyond runway ends	200'	200'
Approach Surface dimensions	500'x1,500'x5,000'	500'x3,500'x10,000'
Approach Surface slope	20:1	34:1
Transitional Surface slope	7:1	7:1
Horizontal Surface radius from runway	5,000'	10,000'
Conical Surface width	4,000'	4,000'

Source: FAA AC 150/5300-13, Airport Design; FAR Part 77 Objects Affecting Navigable Airspace
**A runway-taxiway separation of 400' and a parking setback of 500' is recommended to efficiently enable upgrades to ARC C-III if desired.*

ABILITY OF EXISTING SITE TO MEET FACILITY REQUIREMENTS

As discussed throughout the previous chapters, there are numerous constraints at the existing Cibecue Airport, including significant safety and design standard deficiencies. An analysis of the ability of the existing site to have these deficiencies corrected and meet the airport facility requirements outlined in this chapter is necessary in order to decide to proceed with a site selection study to relocate the airport to a more feasible site. A detailed analysis of the existing sites capabilities and limitations will be included in Chapter 4, Development Alternatives.

Chapter Four
Development Alternatives

Cibecue Airport Master Plan

Chapter Four
Development Alternatives

INTRODUCTION

The preceding discussion of facility needs provides the basis for developing alternative development concepts. The Facility Requirements Chapter provided recommended development for the majority of needs for the existing and future airport for the Cibecue Area. This Chapter will focus on the logical alternatives that the Airport Technical Advisory Committee and the White Mountain Apache Tribe should consider for the existing and future aviation needs of the region. The following list of issues must be considered in the development of alternatives for the airport:

1. Wind – The existing runway alignment does not provide adequate wind coverage. Interviews with fire management contractors indicate that operations must be suspended when the winds aloft are low enough to fight fires, but the crosswind component at the airport is too high. A runway alignment of approximately 2/20 would provide close to 100% crosswind coverage at 10.5 knots. This realignment is not possible at the existing site due to terrain.
2. Terrain – Significant terrain penetrations of all the FAR Part 77 Airspace surfaces exist north, east and south of the airport. In order to meet the Threshold Siting Surface standards, the threshold to Runway 25 would need to be relocated approximately 3,180 feet from the existing runway end.
3. Runway Length – The existing site has only the capability for a 1000-foot extension to the west and no capability for an extension to the east. The maximum runway length possible would be 5,100 feet. This would accommodate the initial required runway length determined previously in this chapter, but not the ultimate required runway length of 7,640 feet.
4. Design Standards – The existing runway gradient exceeds the maximum allowable gradient of 2% is some places. The terrain to the west and southwest of Runway 7 slopes dramatically downward and would require a significant amount a fill material to meet the gradient requirements for the Runway Safety and Object Free Areas. Finally, the Runway Safety Area and Object Free Area penetrations off the end of Runway 25 would require that the existing runway threshold be relocated approximately 600 feet.

Airside and landside development alternatives have been formulated and evaluated based on their ability to accommodate aviation demand levels, airside operational considerations, environmental impacts, and development costs. The alternatives include variations based on the development of new facilities, expansion of existing facilities, or abandonment of existing facilities. Each alternative takes into consideration the above listed issues.

DEVELOPMENT ALTERNATIVES

Airside development is typically the most critical factor in airport planning as these facilities are the focal point of the airport complex and are the physically dominant features of airport development. This first alternative is the “do nothing” alternative and addresses the operational considerations and impacts of maintaining the airport as is. The next two alternatives address correcting the design standard deficiencies identified throughout the previous Chapters. These two alternatives also address the need for additional runway length to accommodate existing and future aviation demand.

The following alternatives were evaluated (NOTE: A detailed graphical layout of alternatives B and C can be found at the end of this Chapter.):

Alternative A – Maintain the airport as it presently exists. (“Do nothing” alternative)

Alternative B – Address all FAA safety and design standard deficiencies and improve the airport at the existing site.

Alternative C – Abandon the existing site and address all FAA safety and design standard deficiencies at a new site.

The following narrative concentrates on the development of facilities needed to meet the existing and future demand and address all FAA safety and design standard deficiencies. Associated preliminary cost estimates for each alternative have also been provided as part of this Chapter. Alternatives B and C include the paving of the runway, a partial parallel taxiway, an aircraft parking area, an air tanker loading area and a helicopter parking area. Land acquisition costs have not been included because the White Mountain Apache Tribe owns and controls all land on the reservation. Land acquisition is addressed with respect to each alternative to identify the land necessary to protect the airport from incompatible development and to meet design standards. Additionally, this Chapter does not include the usual maintenance cost associated with maintaining the existing or future facility.

DESCRIPTION OF DEVELOPMENT ALTERNATIVES

Alternative A - Maintain the airport as it presently exists. ("Do nothing" alternative)

The Cibecue Airport is unique in that it serves as a Bureau of Indian Affairs, Fort Apache Agency Air Tanker Base, as well as providing a facility for air medivac flights and access to the region for business, recreational, and tourism flights. When analyzing various alternatives for development, consideration must also be given to a "No Action" alternative. This alternative would involve maintaining the airport in its current configuration and not developing the recommended facilities or correcting the design standard deficiencies. The existing runway consists of dirt and gravel and is in poor condition. Numerous aircraft operators have indicated that they have ceased operations into Cibecue because of aircraft damage incurred due to the condition of the runway. With this alternative, airport use would likely continue to diminish.

The major advantages to this alternative are:

- Eliminates any funding requirements from the White Mountain Apache Tribe, since no major capital improvement projects would occur.
- Eliminates the potential environmental impacts associated with airport development.

The major disadvantages to this alternative are:

- The poor condition of the existing runway may increase the liability to the White Mountain Apache Tribe as a result of a stronger potential for mishaps occurring at the airport.
- Does noting to reduce nonstandard safety and design conditions presently found at the airport, which include FAR Part 77 and Threshold Siting Surface penetrations by terrain, and insufficient grading of the runway and the runway safety area, object penetrations of the runway object free area and obstacle free zone.
- Significantly reduces the ability of the Cibecue Airport to meet the present and future demand of its users.
- Reduces the capabilities of the Cibecue Clinic to provide affordable fixed wing air medivac and air ambulance services.

It can be anticipated that if the White Mountain Apache Tribe were to choose to take no action, future FAA grant money would be withheld, as the airport would not be in compliance with the FAA recommended safety and design standards. Therefore, the "No Action" alternative is not evaluated further in the scope of this study.

Alternative B - Address all FAA safety and design standard deficiencies and improve the airport at the existing site.

This alternative would improve the airport at the existing site and address all FAA safety and design standard deficiencies. The FAA design standard for an airport reference code B-II airport safety and object free area is 300' beyond the end of the runway. The existing Runway 25 threshold would be relocated approximately 600 feet in order to provide a runway safety and object free area clear of BIA Route 12. This alternative would also displace the threshold of Runway 25 approximately 2,580 feet from the relocated runway end in order to provide a threshold siting surface clear of the terrain to the east of the airport. This would reduce the runway length available for landing on Runway 25 and the runway

length available for takeoff on Runway 7 to approximately 2,520 feet. A partial parallel taxiway would be constructed at the east end of the airport, while a bypass taxiway would be constructed at the west end. Also, an airport-parking area, an air tanker loading area, and a helicopter parking area would be constructed on the north side of Runway 25. The construction of these facilities would require construction of needed infrastructure such as utility lines and access roads and air tanker facilities at the north side of the airport.

The major advantages to this alternative are:

- Eliminates the potential environmental impacts associated with constructing the airport at a previously undisturbed site.
- Eliminates the potential damage to aircraft due to the unimproved nature of the dirt/gravel strip.
- Addresses FAA safety and design standard deficiencies with the exception of the runway wind coverage.

The major disadvantages to this alternative are:

- The capital investment required to improve the airport.
- Requires the relocation of Runway 25 approximately 600 feet in order to provide a runway safety and object free are clear of BIA Route 12.
- Would require the displacement of the Runway 25 threshold approximately 2,580 feet thereby reducing the runway available for landing to the west or taking off to the east to approximately 2,520 feet.
- Requires approximately 220,000 cubic yards of earthwork for the runway in order to meet the FAA required 2% maximum runway gradient standard.
- Total runway length would be limited to approximately 5,100 feet due to terrain to the west and this alternative would not allow for a future upgrade to long-term runway length and strength requirements.
- Would not allow a future upgrade to accommodate large air tanker aircraft.
- Existing runway does not provide the FAA recommended 95% crosswind coverage.
- Requires a reconstructed access road, utilities and air tanker infrastructure including water and slurry tanks.
- Numerous terrain penetrations (mountains) to FAR Part 77 airspace surfaces would remain.

Alternative C - Abandon the existing site and address all FAA safety and design standard deficiencies at a new site.

This alternative would allow the White Mountain Apache Tribe to consider the possible relocation of the Cibecue Airport to a location that would meet FAA recommendations for aircraft having an ARC of B-II initially with the capability for a future upgrade to C-III standards. This alternative would involve conducting a Site Selection Study and an Environmental Assessment. The runway at the new site would be oriented closer to 2/20 in order to align with the prevailing wind. A new site would also require the construction of needed infrastructure such as utility lines, access road, aircraft parking area, air tanker facilities and a helicopter parking area. At the minimum, approximately 140 acres would need to be designated for airport use by the Tribe to construct a 5,100-foot runway, partial parallel taxiway, bypass taxiway, aircraft parking apron, an air tanker loading area and a helicopter parking area. Approximately 46 additional acres would be required for the future runway extension to 7,640 feet and an airport reference code upgrade to C-III, if desired.

The estimated costs for this alternative are based on a hypothetical site that meets grading criteria, crosswind coverage, proximity to the Town of Cibecue, environmental considerations, and FAR Part 77 airspace criteria.

The major advantages to this alternative are:

- There may be several areas within the vicinity of Cibecue that could provide an airport site that would allow unencumbered development to meet FAA safety and design standards.

- The orientation of the existing site is not aligned with prevailing winds and is constrained such that alignment with the prevailing winds is not possible. This alternative would reduce crosswind issues at the airport that have previously closed the airport during critical firefighting operations or caused firefighting aircraft to divert to another airport.
- A new site would provide a runway length that meets the minimum recommendations of 5,100 feet initially and 7,640 feet ultimately. Pavements at the new site could also be strengthened to accommodate large air tankers.
- A new site could potentially eliminate the FAR Part 77 terrain penetrations that exist at the current site.
- A new site could provide a clear threshold siting surface, eliminating the need to displace the runway threshold, and maximize the runway length available for takeoff or landing.
- Eliminates the potential damage to aircraft due to the unimproved nature of the existing dirt/gravel strip.

The major disadvantages to this alternative are:

- The capital investment required to construct a new airport.
- Approximately 140 acres of additional Reservation land would be converted for airport use. However, the existing site could be converted to a replacement use such as cattle grazing.
- The loss of capital investment (if any) at the existing Cibecue Airport.

ACCOMMODATION OF AVIATION DEMAND LEVELS

Both Alternatives B and C would meet existing aviation demand levels. However, Alternative B would significantly restrict landing operations on Runway 25 and takeoff operations on Runway 7. Only Alternative C would accommodate projected medium and long term aviation demand levels including the potential of using Cibecue Airport as a large air tanker base.

AIRSPACE IMPACTS

Alternative B would involve numerous penetrations to the airspace surfaces set forth by Federal Aviation Regulations (FAR) Part 77. This would provide a decreased level of safety due to the significant amount of terrain surrounding the airport that penetrates these surfaces. Alternative B would also involve the displacement of the threshold for Runway 25 approximately 2,580 feet. Alternative C would potentially provide a new site clear of penetrations to FAR Part 77 Airspace surfaces.

ENVIRONMENTAL IMPACTS

None of the alternatives are expected to have any significant environmental impacts based on Federal Aviation Administration (FAA) Order 5050.4A, Airport Environmental Handbook, criteria. However, there is the potential of cultural impacts with Alternative C and any new site selected for airport development would likely have to be surveyed for potential cultural resources.

DEVELOPMENT COSTS

Estimated airside development costs for Alternative B and Alternative C are depicted in Table 4-1 and Table 4-2, respectively, on the following page. Costs are primarily related to construction of a 5,100 foot long by 75-foot wide runway, a partial parallel taxiway and bypass taxiway, an aircraft-parking apron, access road and parking, an air tanker loading area and a helicopter parking area. The primary cost difference is associated with the varying degrees of grading and varying distances for access road and utility extensions.

Alternative B would require the designation of approximately 25 additional acres of tribal land. Additional costs associated with Alternative B include approximately 220,000 cubic yard of earthwork to meet FAA runway gradient standards. However, Alternative B would require fewer linear feet of access road and utility extensions, as power is available near the existing site. Alternative C would require the designation of approximately 140 acres. It is likely that if a thorough site selection is accomplished, a site with relatively flat terrain could be identified and reduce earthwork quantities by approximately 60% or more. However, a new site could potentially require more linear feet of access road and utility extensions.

TABLE 4-1 ALTERNATIVE B INITIAL DEVELOPMENT COSTS (EXISTING SITE)

Fundamental Development Items	Total Cost	Estimated Cost Federal Share	Local Share
Environmental Assessment	$85,000	$80,750	$4,250
Designate Approximately 23 Additional Acres of Land	$0	$0	$0
Construct Access Road	$70,000	$66,500	$3,500
Earthwork for Runway	$1,210,000	$1,149,500	$60,500
Pave Runway (5,100' x 75')	$847,500	$805,125	$42,375
Earthwork for Taxiway	$80,000	$76,000	$4,000
Construct Partial Parallel Taxiway and Bypass Taxiway	$210,000	$199,500	$10,500
Construct Aircraft Parking Apron and Tie Downs	$405,500	$385,225	$20,275
Install Airfield Lighting, Signage and Visual Aids	$478,000	$454,100	$23,900
Install Fencing and Gates	$138,000	$136,800	$7,200
Install Super Unicom	$69,000	$65,550	$3,450
Construct Utilities	$89,000	$84,550	$4,450
Construct Helicopter Parking Area	$150,000	$142,500	$7,500
Construct Air Tanker Loading Area	$160,000	$152,000	$8,000
Construct Vehicle Parking	$52,000	$49,400	$2,600
TOTAL	$4,044,000	$3,847,500	$202,500
Related Development Items			
Purchase Jet A Fuel Truck	$21,000	$19,950	$1,050
Construct FBO/Hangar/Pilots Lounge	$344,000	$326,800	$17,200
Purchase ARFF Vehicle/Snow Sweeper and Storage	$481,000	$456,950	$24,050
TOTAL	$846,000	$803,700	$42,300

TABLE 4-2 ALTERNATIVE C INITIAL DEVELOPMENT COSTS (NEW SITE)

Fundamental Development Items	Total Cost	Estimated Cost Federal Share	Local Share
Site Selection Study	$40,000	$36,424	$3,576
Environmental Assessment	$140,000	$133,000	$7,000
Designate Approximately 140 Acres of Land	$0	$0	$0
Construct Access Road	$279,000	$265,050	$13,950
Earthwork for Runway	$360,000	$342,000	$18,000
Pave Runway (5,100' x 75')	$847,500	$805,125	$42,375
Earthwork for Taxiway	$80,000	$76,000	$4,000
Construct Partial Parallel Taxiway and Bypass Taxiway	$220,000	$209,000	$11,000
Construct Aircraft Parking Apron and Tie Downs	$405,500	$385,225	$20,275
Install Airfield Lighting, Signage and Visual Aids	$482,000	$457,900	$24,100
Install Fencing and Gates	$138,000	$131,100	$6,900
Install Super Unicom	$69,000	$65,550	$3,450
Construct Utilities	$199,000	$189,050	$9,950
Construct Helicopter Parking Area	$150,000	$142,500	$7,500
Construct Air Tanker Loading Area	$160,000	$152,000	$8,000
Construct Vehicle Parking	$52,000	$49,400	$2,600
Install GPS Approach	$7,000	$6,650	$350
TOTAL	$3,629,000	$3,447,550	$181,450
Related Development Items			
Purchase Jet A Fuel Truck	$21,000	$19,950	$1,050
Construct FBO/Hangar/Pilots Lounge	$344,000	$313,246	$30,754
Purchase ARFF Vehicle/Snow Sweeper and Storage	$481,000	$437,999	$43,001
TOTAL	$846,000	$771,195	$74,805

SUMMARY OF DEVELOPMENT ALTERNATIVES

The existing Cibecue Airport is a general aviation facility serving as an Air Tanker Base for the Bureau of Indian Affairs, Fort Apache Agency, as well as providing a facility for air medivac and air ambulance flights to and from the Cibecue Clinic. The airport also provides access to the region for business, recreational, and tourism flights. Numerous factors at the airport create an unsafe operating environment and justify the need to improve the airport to meet FAA safety and design standards. Some of these factors include the poor condition and steep grade of the existing dirt/gravel runway, the extreme crosswind conditions at the airport and the surrounding terrain that penetrates FAR Part 77 surfaces and presents a hazard to aircraft.

The alternatives discussed in this Chapter are listed below, depicted in the drawings located at the end of this Chapter, and summarized in Table 4-3 with respect to estimated cost, meeting FAA standards, ability to upgrade to ARC C-III standards and other considerations.

Cibecue Development Alternatives

Alternative A – Maintain the airport as it presently exists. ("Do nothing" alternative)

Alternative B – Address FAA safety and design standard deficiencies and improve the airport at the existing site.

Alternative C – Abandon the existing site and address all FAA safety and design standard deficiencies at a new site.

TABLE 4-3 COMPARISON OF DEVELOPMENT ALTERNATIVES

	Estimated Capital Cost	FAA Standards Met	Ability to Upgrade to C-III Standards	Other Considerations
Alternative A	$0	No	No	Continued Operability of Airport Questionable
Alternative B	$4,044,000	Yes*	No, Runway Length Constraints	Crosswinds, TSS and Part 77 Airspace Concerns
Alternative C	$3,629,000	Yes	Yes	Requires Site Selection Study

**With the exception of runway wind coverage*

SELECTION OF THE PREFERRED ALTERNATIVE

The recommended alternative for development of the Cibecue Airport is Alternative C.

Alternative B addresses the majority of FAA safety and design standard deficiencies, but does not correct the runway wind coverage. This is a significant issue as fire fighting and suppression operations in the past have had to be suspended or diverted to another airport because of high crosswinds at Cibecue. Another concern with Alternative B is the surrounding terrain and need to significantly displace the threshold, limiting the runway available for takeoff on Runway 7 and the runway available for landing on Runway 25. A runway threshold displacement of approximately 2,580 feet is not considered an adequate solution to address the issue of high terrain surrounding the airport. The resulting useful takeoff length for Runway 7 and landing length for Runway 25 of 2,520 feet is not adequate for the King Air or Pilatus air medivac aircraft or the fully loaded Air Tractor 802F single engine air tanker. Finally, estimated capital costs of Alternative B are actually higher than estimated costs for relocating the airport, primarily due to the significant amount of earthwork required to meet FAA gradient standards for the runway.

Alternative C provides an airport facility that could potentially meet FAA safety and design standards, recommended runway lengths, and provide efficient service to the Cibecue area. Assuming a relatively

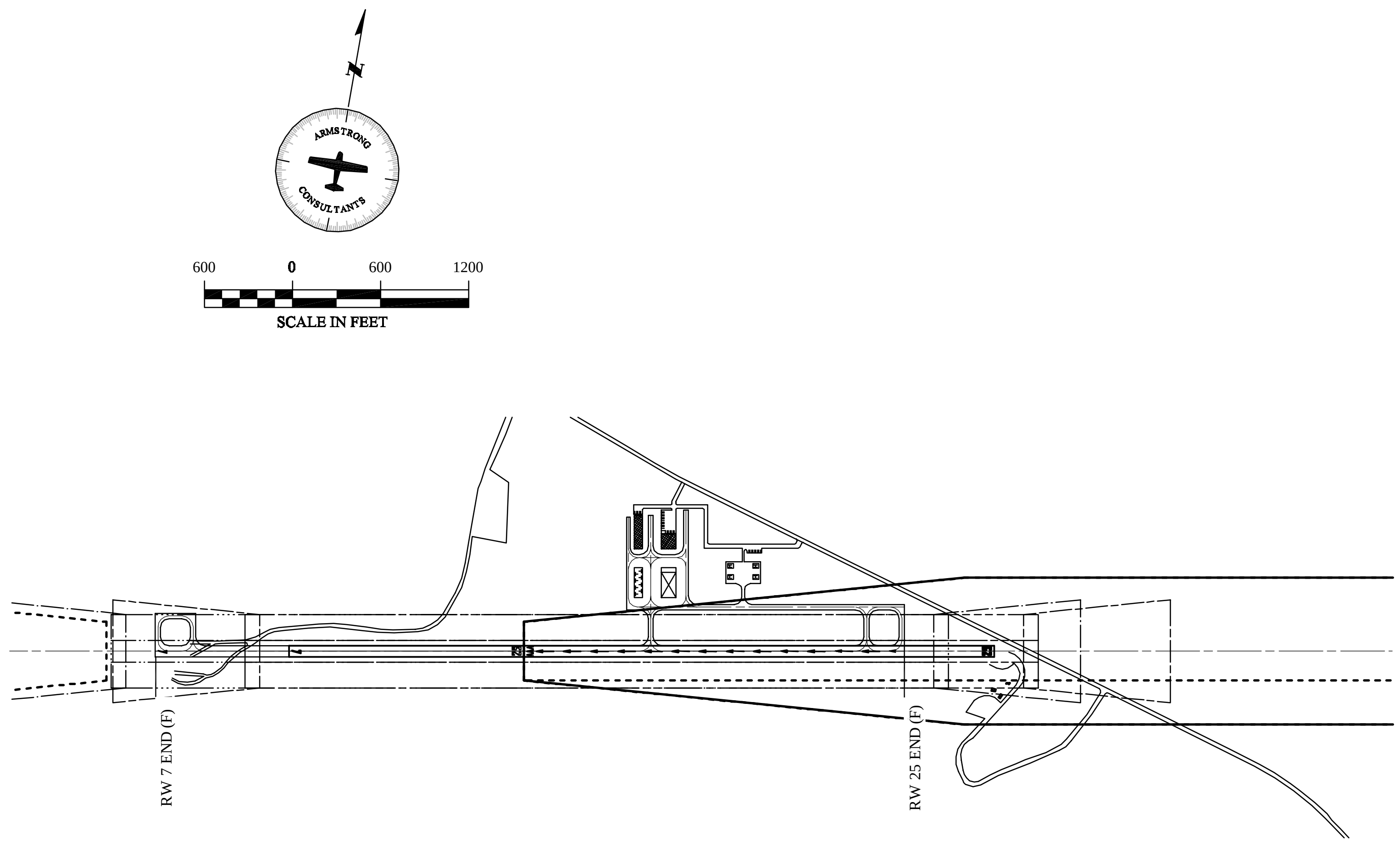
flat site is selected, relocating the airport would actually be more cost effective than improving the existing site. Alternative C would also address all the safety concerns that exist at the airport such as high crosswinds and terrain. Finally, the new airport could be constructed as described in Alternative C so as to allow a future upgrade to ARC C-III standards and accommodate large Type I and II air tankers.

As a result of this analysis of the development alternatives, Alternative C is recommended as the preferred alternative. Pursuant to FAA and Sponsor concurrence with Alternative C as the preferred alternative, a Site Selection Study should be commenced in order to determine a preferred site for the relocated airport.

NEXT STEPS

The next steps in the development process include the following. The Site Selection portion of the study will commence immediately upon receipt of the notice to proceed from the Tribe. A grant application has been submitted to the FAA for funding the environmental assessment with fiscal year 2004 general aviation entitlement funds. The design and construction timeframe will depend on the availability of FAA funds.

- Site Selection Study (Included in existing FAA grant)
- Airport Layout Plans (Included in existing FAA grant)
- Environmental Assessment (Anticipated FY 2004 FAA grant)
- Dedication of Land by White Mountain Apache Tribe
- Design Engineering
- Bidding and Construction



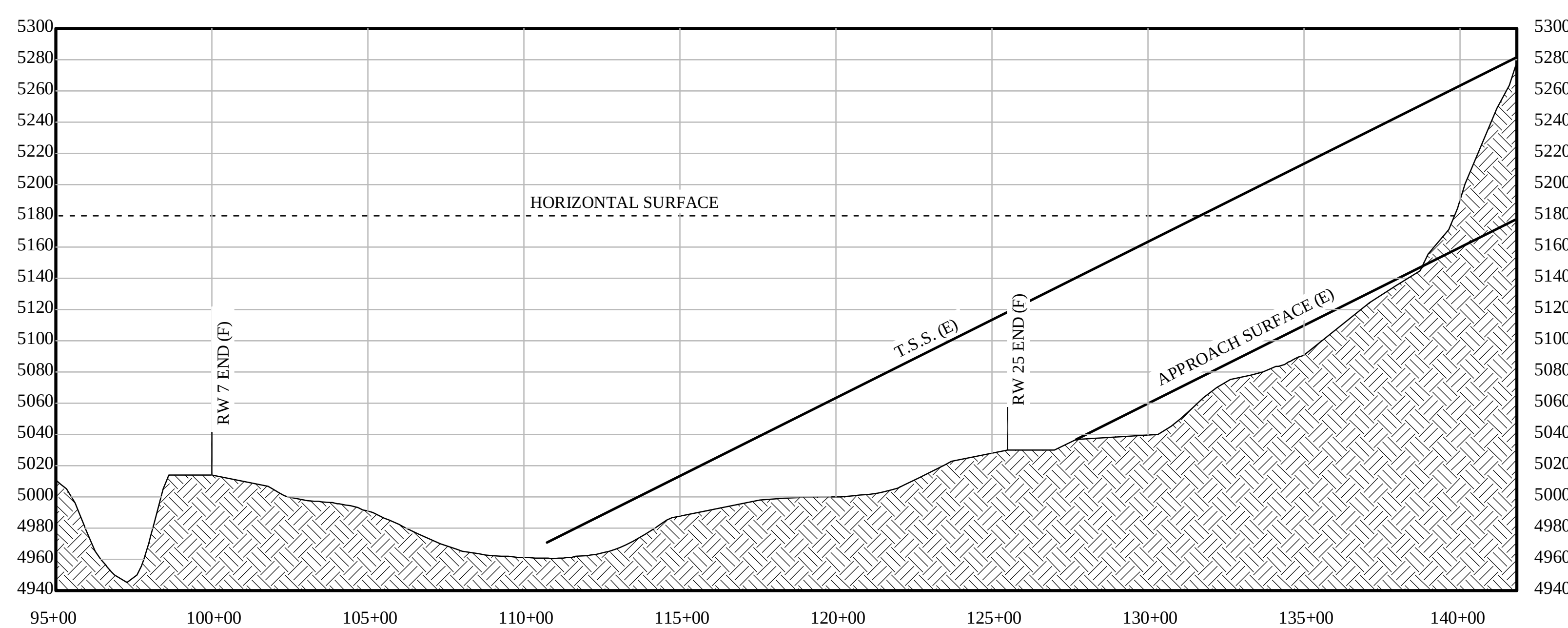
<u>*Alternative B - Address all FAA safety and design standard deficiencies and improve the airport at the existing site.*</u>

The major advantages to this alternative are:

- Eliminates the potential environmental impacts associated with constructing the airport at a previously undisturbed site.
- Eliminates the potential damage to aircraft due to the unimproved nature of the dirt/gravel strip.
- Addresses all FAA safety and design standard deficiencies with the exception of the runway wind coverage.

The major disadvantages to this alternative are:

- The significant amount of capital investment required to improve the airport.
- Requires the relocation of Runway 25 approximately 600 feet in order to provide a runway safety and object free are clear of BIA Route 12.
- Would require the displacement of the Runway 25 threshold approximately 2,580 feet thereby reducing the runway available for landing to the west or taking off to the east to approximately 2,520 feet.
- Requires approximately 220,000 cubic yards of earthwork for the runway in order to meet the FAA required 2% maximum runway gradient standard.
- Total runway length would be limited to approximately 5,100 feet due to terrain to the west and this alternative would not allow for a future upgrade to long-term runway length and strength requirements.
- Would not allow a future upgrade to accommodate large air tanker aircraft.
- Existing runway does not provide the FAA recommended 95% crosswind coverage.
- Requires a reconstructed access road, utilities and air tanker infrastructure including water and slurry tanks.



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CIBECUE MUNICIPAL AIRPORT
CIBECUE, ARIZONA

AIRPORT LAYOUT PLANS

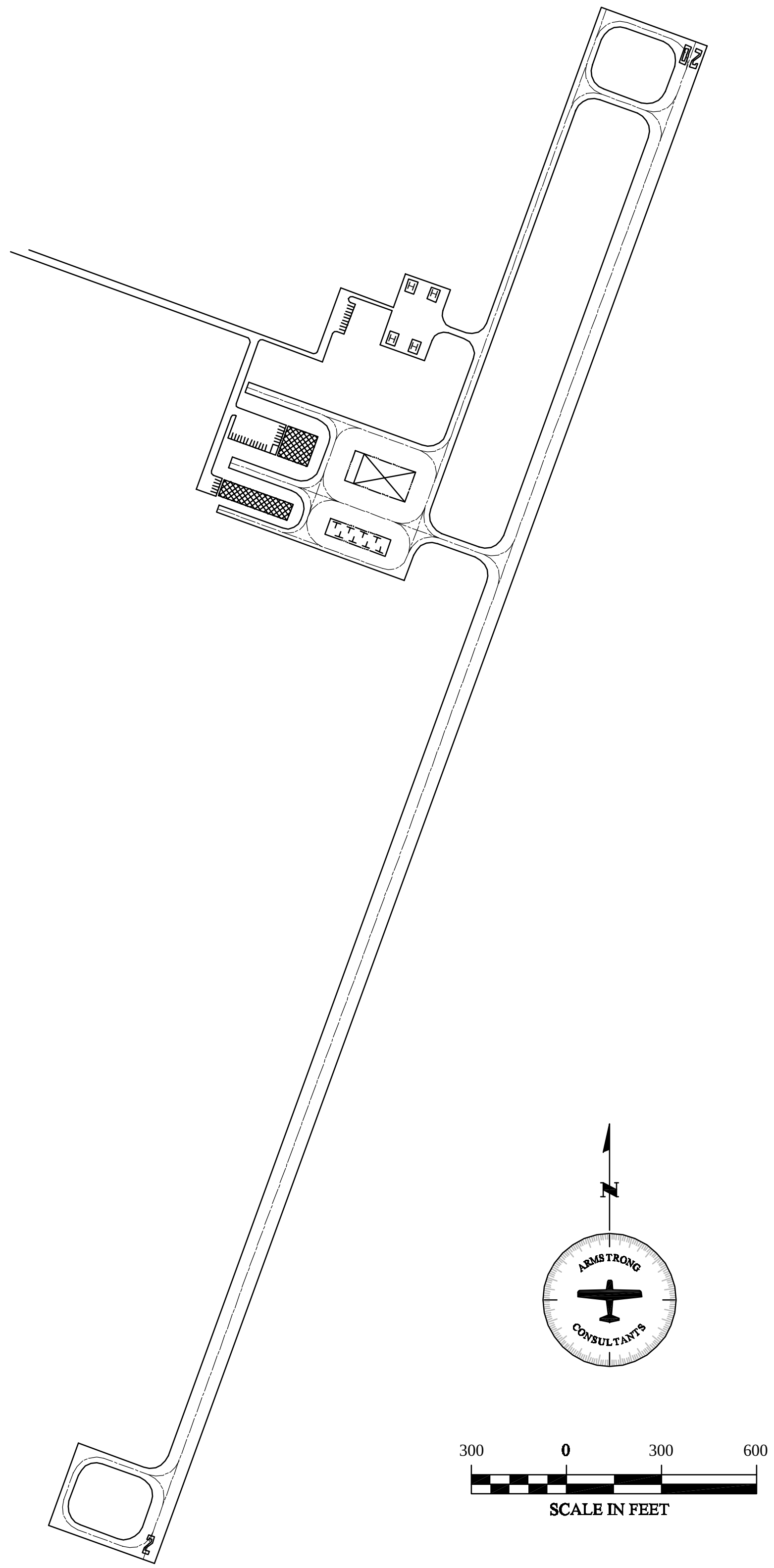
No.	Revision	Date	By

Project No: 035674
Date: 1/29/04
File Name: 5674521

Drawn: RF
Checked: REH
Approved: DAC

ALTERNATIVE B

Sheet: of:



Alternative C - Abandon the existing site and address all FAA safety and design standard deficiencies at a new site.

- There may be several areas within the vicinity of Cibecue that could provide an airport site that would allow unencumbered development to meet FAA safety and design standards.
- The orientation of the existing site is not aligned with prevailing winds and is constrained such that alignment with the prevailing winds is not possible. This alternative would reduce crosswind issues at the airport that have previously closed the airport during critical firefighting operations or caused firefighting aircraft to divert to another airport.
- A new site would provide a runway length that meets the minimum recommendations of 5,100 feet initially and 7,640 feet ultimately. Pavements at the new site could also be strengthened to accommodate large air tankers.
- A new site could potentially eliminate the FAR Part 77 terrain penetrations that exist at the current site.
- A new site could provide a clear threshold siting surface, eliminating the need to displace the runway threshold and reduce the runway length available for takeoff or landing.
- Eliminates the potential damage to aircraft due to the unimproved nature of the existing dirt/gravel strip.

The major disadvantages to this alternative are:

- The significant amount of capital investment required to construct a new airport.
- Approximately 140 acres of additional Reservation land would be converted for airport use. However, the existing site could be converted to a replacement use such as cattle grazing. The loss of capital investment (if any) at the existing Cibecue Airport.

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CIBECUE MUNICIPAL AIRPORT
CIBECUE, ARIZONA

AIRPORT LAYOUT PLANS

No.	Revision	Date	By

Project No: 035674
Date: 1/29/04
File Name: 5674520

Drawn: RF
Checked: REH
Approved: DAC

ALTERNATIVE C

Sheet: of:

Chapter Five
Preliminary Site Analysis

Cibecue Airport Master Plan

Chapter Five
Preliminary Site Analysis

INTRODUCTION

The most fundamental elements of establishing an airport site are identifying areas with relatively flat terrain (less than 5 percent slope) and identifying open areas with minimum airspace conflicts. This element is particularly challenging in a mountainous area such as Cibecue. To identify potential airport sites, USGS topographic maps were reviewed to identify areas offering adequate terrain surfaces that could potentially accommodate an airport site. The search area was limited to a twenty-mile radius from Cibecue. All potential sites within five miles of Cibecue were considered and sites beyond five-miles from Cibecue were considered if they had highway or road access. An overlay analysis was performed and areas unsuitable for development were eliminated from consideration. The potential sites resulting from this initial review are listed below and are shown in Figure 5-1. A potential airport layout is also shown for each site over aerial photographs in Appendix A.

- Caddo Point Site (Site 1)
- Landing Strip Site A (Site 2A)
- Landing Strip Site B (Site 2B)
- Lone Pine Site (Site 3)
- Cibecue Canyon Site (Site 4)
- Wildhorse Tank Site (Site 5)

Each of these sites is further evaluated in this Chapter with respect to the criteria listed in the following section.

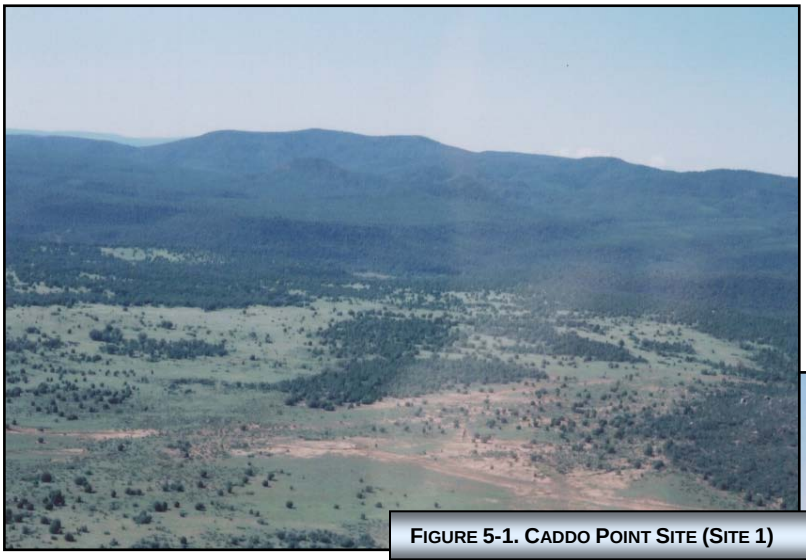


FIGURE 5-1. CADDO POINT SITE (SITE 1)

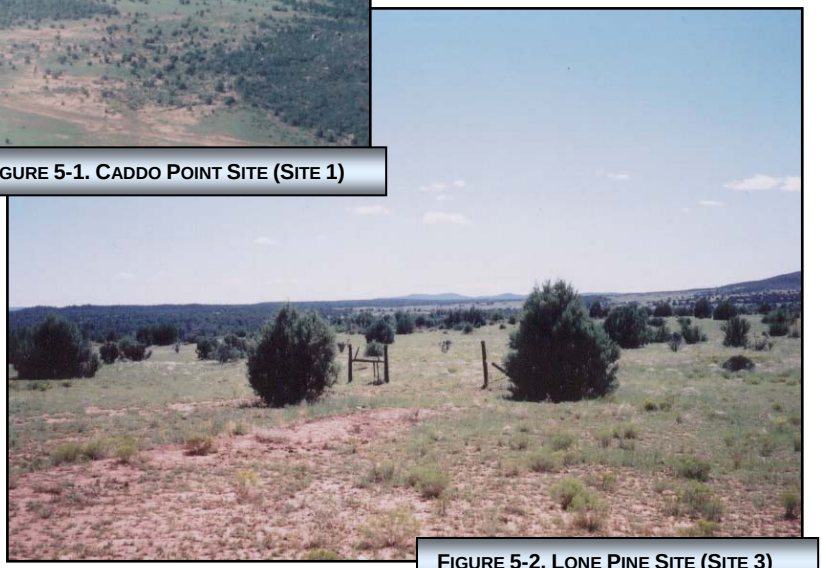


FIGURE 5-2. LONE PINE SITE (SITE 3)

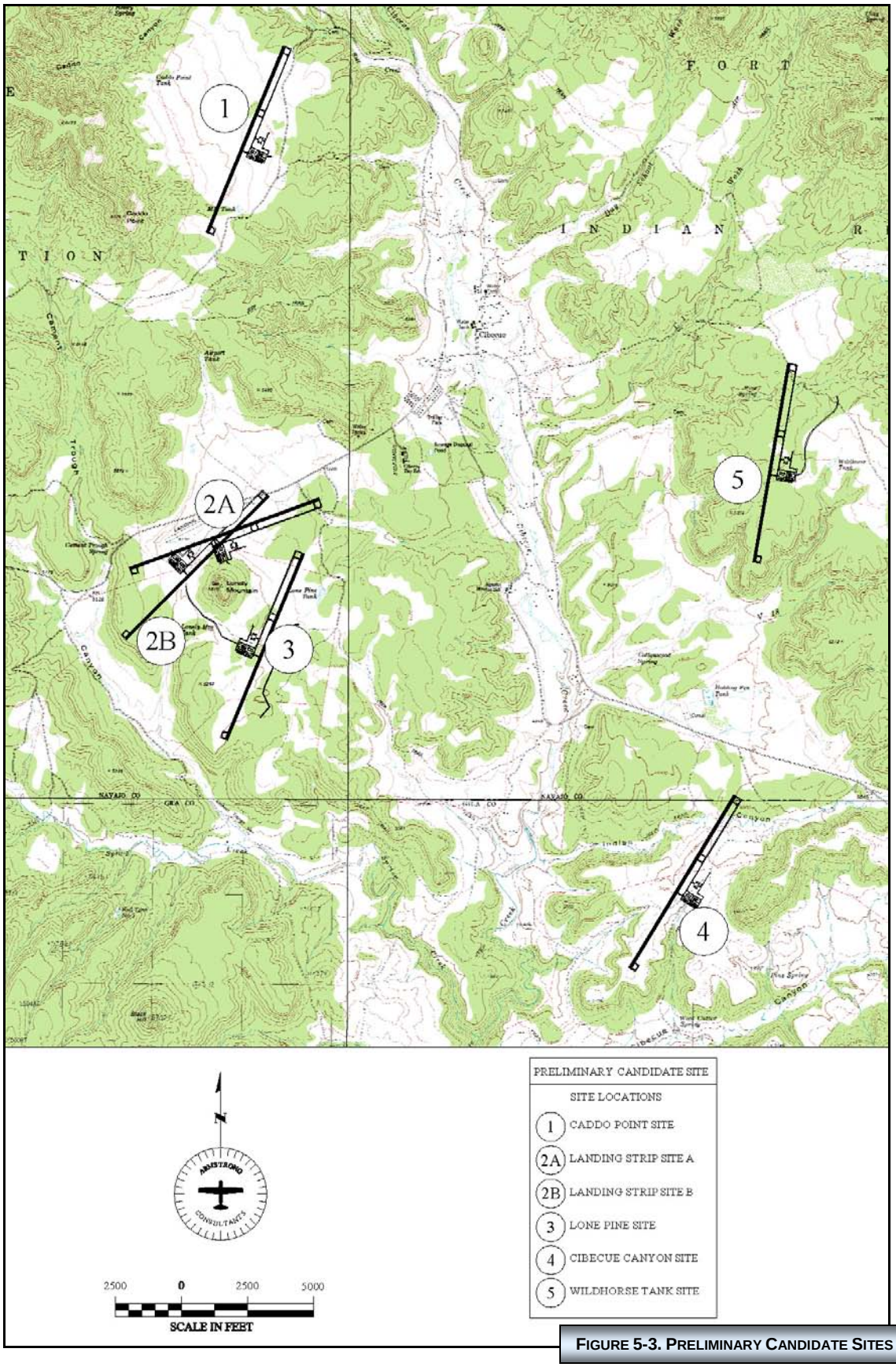


FIGURE 5-3. PRELIMINARY CANDIDATE SITES

SCREENING CRITERIA

The screening criteria listed below were utilized to provide an initial evaluation of potential airport sites. A rating of Meets Criteria, Marginal, or Does Not Meet Criteria was assigned to each criterion for each site. The rating criteria are listed below and described in the following sections.

1) Location (proximity to Cibecue)
2) Soil type
3) Terrain features that would preclude airport development
4) Runway alignment with prevailing winds
5) Site layout
6) Airspace
7) Other factors (safety, access, wind shear, Tribal departmental comments)

LOCATION

FAA Order 5030.3C uses 30 minutes ground travel time (20-mile radius) as the maximum recommended distance for an airport from the community it serves. However, the remoteness of the Cibecue area and the limited access to roads and highways required the analysis to be focused within a 5-mile radius of Cibecue with any additional sites outside this radius having direct access to the highway in order to provide convenient access to the airport for fire fighting and air medivac operators and to minimize ground travel distance.

A "Meets Criteria" was assigned if the site was located within 5-mile radius of Cibecue. A "Marginal" was assigned if the site was located beyond 5-miles, but had direct highway access. A "Does Not Meet Criteria" was assigned if the site was not within a 5-mile radius of Cibecue and did not have direct highway access.

SOIL TYPE

Soils must be analyzed to determine their affect on grading, pavements and drainage. The cost of construction is influenced by the nature of the soil present on-site. Ideally, the site should be well-drained, open space, with sand and/or gravely soil that is suitable for pavement foundation without the need for a substantially thick subbase or an expensive drainage system. The soil's bearing capacity or California Bearing Ratio (CBR) directly affects the pavement section thickness required to provide a given pavement strength. The vegetation present at the site is another important factor as much of the land surrounding Cibecue is densely forested and not suitable for airport development.

A "Meets Criteria" was assigned if the soil type for the site is well suited for airport development without over excavation and/or substantial subbase required. A "Marginal" was assigned if the site requires limited over excavation and/or subbase. A "Does Not Meet Criteria" was assigned if the soil is particularly poor and would require over excavation and/or substantial subbase.

TERRAIN

The initial step in identifying areas available for the potential development of an airport site was to analyze the terrain conditions in the study area. As specified in Chapter 5 of FAA Advisory Circular 150/5300-13, *Airport Design*, the maximum longitudinal grade for runways with an Airport Reference Code of B-II is 2 percent. Therefore, reasonably level terrain, or terrain that could be graded without excessive costs, is desirable. Consequently, large areas with steep slopes (defined in this study as greater than 5 percent) should be eliminated from consideration during the preliminary screening of the study area. Much of the study area is characterized by terrain with slopes greater than 5 percent that is not ideal for airport development.

A "Meets Criteria" was assigned if the entire site has a slope of 5 percent or less. A "Marginal" was assigned if portions of the site exceed 5 percent but a majority of the site is 5 percent or less. A "Does Not Meet Criteria" was assigned if a majority of the site exceeds 5 percent.

ALIGNMENT

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the crosswind coverage of the runway does not meet this 95 percent minimum, then a crosswind runway should be considered. As crosswinds can create a hazardous operating situation, runway alignment plays an important role in the safety and utility of the airport. The existing Cibecue Airport does not meet this 95 percent crosswind coverage requirement. When high crosswinds are present at the existing airport, aircraft are forced to delay a departure or divert to another airport. This is especially detrimental during fire fighting operations. Prevailing winds for the Cibecue area are from the south/southwest.

Potential airport sites were screened for the capability of a south/southwesterly runway alignment. Where a south/southwesterly alignment was not possible, the sites were screened for the potential of accommodating a crosswind runway.

A "Meets Criteria" was assigned if the site provided a runway alignment between 190° and 195° true bearing (179° to 184° magnetic bearing). A "Marginal" was assigned if the runway alignment was outside of this range, but the alignment was still anticipated to provide at least 95 percent wind coverage. A "Does Not Meet Criteria" was assigned if the runway alignment was outside of this range and the alignment was not anticipated to provide at least 95 percent wind coverage.

SITE LAYOUT

Potential sites were screened for their ability to accommodate aviation demand and the proposed airport configuration. The airport layout depicted in the development alternatives in Chapter 4 was used as a template to determine if the size and shape of the potential sites were capable of meeting runway length, safety area, and landside facility developments. A future runway extension to 7,600-feet was also considered.

A "Meets Criteria" was assigned if the site could accommodate the ultimate potential airport configuration, including runway (and extension), partial parallel taxiway, apron, and hangar areas. A "Marginal" was assigned if site features such as drainages, terrain, or roads would need to be addressed. "A Does Not Meet Criteria" was assigned if the ultimate airport configuration could not be accommodated.

AIRSPACE

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, establishes "imaginary surfaces" (i.e. height restrictions) around airports to prevent potential airspace obstructions, such as topographical features, vegetation, trees, buildings, and other structures from penetrating the airspace allocated for the safe arrival and departure of aircraft to or from the airport.

Potential sites were reviewed for compliance with FAR Part 77 Airspace Surfaces. A "Meets Criteria" was assigned if all FAR Part 77 surfaces were found to be clear. A "Marginal" was assigned if the only obstructions of the FAR Part 77 airspace surfaces were penetrations of the horizontal and/or conical surface for either the initial or ultimate airport configuration. A "Does Not Meet Criteria" was assigned if FAR Part 77 penetrations consisted of penetrations to the horizontal and/or conical surfaces and the approach surface.

OTHER FACTORS

All sites were screened for potential safety hazards. These include incompatible wildlife attractants such as wetlands and ponds, terrain alignments with wind shear potential, and low lying areas subject to potential flooding. The FAA stipulates that wetlands, landfills, and other wildlife attractants should not be located any closer than 5,000 feet to an airport serving propeller driven aircraft. Downdrafts occurring near mountainous terrain can cause mountain wave currents at high altitudes and dangerous low-level wind shear at low altitudes. This is especially dangerous if it were to occur on final approach or on departure.

Additional factors that were considered for each site include the potential for impacting sensitive species, cultural/historical resources, forestry and livestock/grazing. Numerous departments with the White

Mountain Apache Tribe were contacted for comments on these factors including Game and Fish, Historic Preservation, Cultural Resources, Forestry, Agricultural Enterprise and the Fort Apache Timber Company.

A "Meets Criteria" was assigned if no factors were found to create a potential safety hazard and no departments expressed concern about the site. A "Marginal" was assigned if potential safety hazards were in the vicinity of the site, but could be mitigated or if there was a potential concern from a tribal department that could be mitigated. A "Does Not Meet Criteria" was assigned if significant factors were found, such as rising terrain in the vicinity of the potential site, which could cause wind shear. A "Does Not Meet Criteria" was also assigned if a Tribal department expressed significant concerns and these concerns could not be mitigated.

The following list of preliminary candidate sites was formulated from the initial screening criteria listed above and input from the Airport Technical Advisory Committee (ATAC). The locations of these sites are shown in Figure 5-3 and Appendix A.

- Caddo Point Site (Site 1)
- Landing Strip Site A (Site 2A)
- Landing Strip Site B (Site 2B)
- Lone Pine Site (Site 3)
- Cibecue Canyon Site (Site 4)
- Wildhorse Tank Site (Site 5)

The results of the screening analysis for each category are discussed in the following sections and are summarized in the matrix at the end of this Chapter.

PRELIMINARY SITE SCREENING

LOCATION

All of the candidate sites are located within a 5-mile radius of Cibecue. Site 1 is located approxiamtely 2 miles northwest of Cibecue. Sites 2A and 2B are located approximately 2 miles southwest of Cibecue immediately south of BIA Route 12. Site 3 is located immediately south of Site 2. Site 4 is located immediately south of the existing Cibecue Airport, approximately 4.3 miles south of Cibecue and Site 5 is located approximately 2 miles west of Cibecue.

SOIL TYPE

Site 1 is comprised entirely of Tours Silt Loam soil. This type of soil is usually nearly level to moderately sloping. It is also found in small areas intermingled with rolling to hilly Jacks and Chevelon soils. Tours Silt Loam is classified under the unified classification system as CL, usually lean clays, sandy clays, or gravelly clays. CL soils typically have a California Bearing Ratio (CBR) of 5-15.

Sites 2A and 2B are comprised almost entirely of Navajo Clay Loam soil. This type of soil is usually nearly level soil located in long, narrow swales and bottoms and is gently sloping on eroded alluvial fans. Slope ranges from 0 to 5 percent. Navajo Clay Loam is classified under the unified classification system as CL, usually silty clay and clay. CL soils typically have a CBR of 5-15.

Site 3 is comprised almost entirely of Roundtop Gravelly Clay Loam soil. This type of soil is usually level to gently rolling and is often dissected by common shallow gullies. Roundtop Gravelly Clay Loam can be classified under the unified classification system as CH, CL or GC. CH soils typically have a poor CBR of 3 to 5. CL soils typically have a CBR of 5-15 and GC soils typically have a good CBR of 20 to 40.

Site 4 is comprised of Roundtop-Rock outcrop complex and Roundtop-Jacks-Rock outcrop complex soils. These types of soils are often found at moderately sloping areas and consist of a mix of Roundtop clay loam, Jacks cobbly clay loam and limestone and sandstone rock outcrops. Roundtop soils can be classified under the unified classification system as CH, CL or GC. Jacks soil is usually classified as CH.

CH soils typically have a poor CBR of 3 to 5. CL soils typically have a CBR of 5-15 and GC soils typically have a good CBR of 20 to 40.

Site 5 is comprised of Chevelon Cobbly Clay loam. And Tours Silt Loam soils. Chevelon Cobbly Clay loam is typically located in areas with 8 to 30 percent slopes and the surface layer is often covered with cobles and stones. Tours Silt Loam is usually found in areas nearly level to moderately sloping. These soils are classified as either ML or CL and typically have a CBR of 5-15.

Sites 3 and 4 have the best potential for good soil without over excavation and/or substantial subbase required. However, Sites 3 and 4 also have the potential for soils classified as CH, which typically have a poor CBR of 3 to 5. For this reason, all sites were assigned a marginal criteria, meaning they will all likely require limited over exaction and/or subbase.

TERRAIN

The terrain of Site 1 slopes downward from the southwest portion of the site to the northeast portion of the site at a slope of approximately 2.1 percent. The terrain of Sites 2A and 2B is relatively flat with a gradient between 1.0 percent and 1.5 percent. Site 3 has the most ideal terrain dropping less than 50 feet over the entire site at an approximate gradient of 0.6 percent. The terrain of Site 4 is relatively flat for the initial 5,000 feet, however, the north end of the site crosses a drainage and the gradient exceeds 5 percent at this end. The terrain of Site 5 slopes downward from east to west creating a cross slope similar to Site 1.

The terrain of Site 5 slopes significantly from east to west at a cross slope to the runway, similar to Site 1. Another concern with Sites 1 and 5 is the amount of earthwork required to improve the access roads to each site. Because of this access road constraint, Sites 1 and 5 were assigned “Does Not Meet Criteria.”

RUNWAY ALIGNMENT

The runway alignment of Sites 1 and 3 fall within the preferred range of 190° to 195° true bearing (179° to 184° magnetic bearing). Sites 2A, 2B, 4 and 5 are outside of the preferred range. The alignment of Site 2A is 250° true bearing. This is the optimal alignment at Site 2A based on the surrounding terrain, however, this alignment does meet the runway wind coverage, which is why Site 2B was considered. The true alignment of Site 2B is 225°. The true alignments of Site 4 is 211° and the true alignment of Site 5 is 185°.

The current magnetic alignment of the runways at Sites 1 and 3 is 192°. Sites 2B, 4 and 5 are outside of the preferred range, but still anticipated to provide at least 95 percent wind coverage. According to the Limestone Canyon wind rose in Chapter 1, the alignment of Sites 1 and 3 are within the preferred range and will provide close to 100 percent wind coverage.

SITE LAYOUT

Sites 1 and 5 offer adequate space to accommodate the recommended runway configuration. The layout constraints to these two include the cross slopes the runway would have to be built on and the steep access road that will have to be improved up to the sites. There are two stock tanks at Site 1, but they are not a major concern. A significant drainage would have to be crossed at Site 5 in addition to a significant amount of vegetation to be removed.

The primary layout constraint to Site 2A and 2B is BIA Route 12 passing immediately north of the sites. Developing Site 2B could require the relocation of a portion of BIA Route 12. There are few layout constraints at Site 3 other than a small amount of vegetation to be removed. The layout constraints at Site 4 include the significant amount of fill and the culvert required for the drainage crosses the area. The full runway extension to 7,600-feet is not considered feasible at Site 4

AIRSPACE

The only airspace concern for Site 1 is rising terrain immediately west of the site. Flight patterns would likely have to be directed east of the site, closer to the community of Cibecue. Site 2A has a FAR Part 77

horizontal surface penetration by terrain north and south (Lonely Mountain) of the site. Site 2B has the same penetrations, however, its location is closer to Lonely Mountain and flight patterns would either have to be directed northwest of the runway and over the rising terrain or southeast of the runway over Lonely Mountain. Site 2B also has an approach surface penetration by terrain to the north for the ultimate airport configuration. This is a major concern for Sites 2A and 2B, as these terrain penetrations would present a hazard to air navigation, because they exist on both sides of the runway. Lonely Mountain would also be a horizontal surface penetration for Site 3, however, the terrain hazard could be avoided by publishing a non-standard right hand traffic pattern for the approach to the south end of the runway, thus keeping all flight patterns east of the runway. Again, at Site 4, a horizontal surface penetration by terrain exists immediately east of the site. A non-standard right hand traffic pattern would have to be published for the approach to the north end of the runway, thus keeping all flight patters west of the runway. At Site 5, an approach surface and horizontal surface penetration by terrain exists north of th esite. Landing to the south into the prevailing wind would be extremely challenging due to this high terrain.

OTHER FACTORS

Comments were solicited from various Tribal departments with respect to the preliminary airport sites. These departments included Game and Fish, Historic Preservation, Cultural Resources, Forestry, Agricultural Enterprises and the Fort Apache Timber Company. The Tribal Historic Preservation Officer expressed concern about the proximity of several sites to Lonely Mountain, a place of substantial cultural, religious and historical importance. This Historic Preservation Officer also stated that there are likely to be substantial heritage resource issues associated with Site 1, the Caddo Point Site and that Tribal Council concurrence would be required to develop at either of these sites.

In addition to an on-site survey for cultural resources, potential historic/cultural mitigation would include an education program and exhibit at the new airport. A plan to install an exhibit that informs the public of the importance of Lonely Mountain to the White Mountain Apache Tribe and highlights the cultural, religious and historical importance of the Mountain could be developed and included in the design and construction of the airport. Such an exhibit could also include the importance of fire fighting activities by the Bureau of Indian Affairs (BIA) in the area. This exhibit could be displayed in the primary building at the Cibecue Airport that serves the airport users. Comments were also received from the Cibecue Cattle Association during a meeting and site visit in May of 2004. The Cattle Association recommended pursuing Site 3 and also recommended that the existing site be converted and designated for cattle grazing use.

TABLE 5-1 PRELIMINARY SITE SCREENING ANALYSIS MATRIX

	Caddo Point Site (Site 1)	Landing Strip Site (Site 2A)	Landing Strip Site B (Site 2B)	Lone Mountain Site (Site 3)	Cibecue Canyon Site (Site 4)	Wildhorse Tank Site (Site 5)
Location	○	○	○	○	○	○
Soil Type	●	◉	◉	◉	◉	◉
Terrain (≤ 5 % slope)	◉	○	○	○	◉	●
Runway Alignment	○	●	◉	○	◉	◉
Site Layout	◉	○	○	○	●	◉
Airspace	◉	◉	●	◉	◉	●
Other Factors	◉	◉	◉	◉	○	◉

Legend: ○Meets Criteria ◉Marginal Criteria ●Does Not Meet Criteria

RECOMMENDATIONS

Upon review and consideration of the findings contained herein, and comments received from the Cibecue Transportation Committee meeting and site visit in May of 2004, it is recommended that sites 2B and 3 be considered for refined site analysis in Chapter 6.

Chapter Six
Refined Site Analysis

Cibecue Airport Master Plan

Chapter Six
Refined Site Analysis

INTRODUCTION

This chapter includes an analysis of the Landing Strip Site B (Site 2B) and the Lone Pine Site (Site 3). The application of the evaluation criteria listed below was accomplished through the use of available background data research, topographic maps, field inspection, aerial photography, input from the Airport Technical Advisory Committee (ATAC), and coordination with responsible agencies. A drawing of the potential airport layout at both candidate sites is included on the following page.

Site Evaluation Criteria:

- Ability to accommodate airfield facilities and aviation related development;
- Engineering considerations;
- Access to supportive infrastructure;
- Safety, utility, and airspace considerations;
- Potential environmental impacts; and
- Estimated development costs.

The sites were evaluated based on the planned Phase I development items and potential Phase II development items as described in Chapter 3 and listed below. Phase I is the anticipated minimum development level based on the forecasted short-term aviation demand. Phase II developments would be accomplished if justified by future aviation activity levels.

Planned Phase I Development Includes:

- Runway: 75' x 5,100'; 16,000 pounds pavement strength
- Bypass Taxiways and Partial Parallel Taxiway
- Retro-reflective Taxiway Lighting
- Aircraft Parking Apron
- Air Tanker Loading Area
- Helicopter Parking Apron
- Retro-reflective Runway Edge Lighting
- Precision Approach Path Indicators
- Rotating Airport Beacon
- Automated Universal Communication (UNICOM)
- Vehicle Access Road and Parking
- Segmented Circle and Wind Cone
- Airport Perimeter Fencing

Potential Phase II Development Includes:

- Extend Runway and Partial Parallel Taxiway to 7,640'
- Runway and Taxiways Strengthened to 30,000 pounds
- GPS Non-Precision Approach
- Apron and Fencing Expansion

ABILITY TO ACCOMMODATE AIRFIELD FACILITIES AND AVIATION RELATED DEVELOPMENT

The ability of the sites to accommodate the required facilities is based on natural localized features, including topography, drainages, and physical features such as roads and existing development. Site 2B is located immediately south of BIA Route 12 and immediately north of Lonely Mountain at an elevation of approximately 5,200 feet MSL. The proposed runway alignment is southwest to northeast (Runway 3/21). Phase I development could be accommodated at this site with the partial parallel taxiway and aircraft parking apron located northwest of the runway. For Phase II development the runway extension to the north would be limited by BIA Route 12. The full recommended Phase II runway extension to 7,640 feet would be to the northeast and require the relocation of BIA Route 12.

Site 3 is located less than one mile south of Site 2B on the southeast side of Lonely Mountain at an elevation of approximately 5,200 feet MSL. The proposed runway alignment is closer to north/south at this site (Runway 1/19). Phase I development could be accommodated at this site with the partial parallel taxiway and aircraft parking apron located west of the runway. For Phase II development the runway extension to 7,640 feet would be to the north. There is adequate land available at this site for all recommended Phase I and Phase II landside facilities.

ENGINEERING CONSIDERATIONS

Engineering considerations for both sites include clearing and grubbing requirements, grading and drainage characteristics, and soil characteristics. Site features and existing vegetation for each site are shown in Figure 6-2 and 6-3.

Site 2B is relatively clear of vegetation and primarily consists of scattered scrub brush and grasses. Clearing and grubbing is not considered to be significant. The site slopes downward from the southwest to the northeast at an approximate gradient of 1.1 percent. The maximum longitudinal gradient for a Category B runway is 2 percent. The optimum situation would be to balance excavation and embankment earthwork requirements. Utilizing a 2 percent runway gradient, Site 2B would require approximately 85,000 cubic yards of earthwork for the initial Phase I runway construction. A consideration for the future runway extension at Site 2B is the drainage that crosses the northeast end of the site. Phase II development would require a culvert for this drainage. Soils consist of silty and gravely clay. These soils are considered fair to poor for construction purposes and have poor to practically impervious drainage characteristics.

Site 3 contains a higher concentration of scrub brush that would require clearing and grubbing (Figure 6-3). This site is relatively flat with an approximate gradient of 0.6 percent. Utilizing a 1.5 percent runway gradient, the site would require approximately 65,000 cubic yard of earthwork for runway construction in Phase I. Drainage flows west to east at the site. Soils at Site 3 consist of gravely clay loam and gravely clay. These soils are considered fair to poor for construction purposes with poor to practically impervious drainage characteristics.

FIGURE 6-2. LANDING STRIP SITE B (SITE 2B)

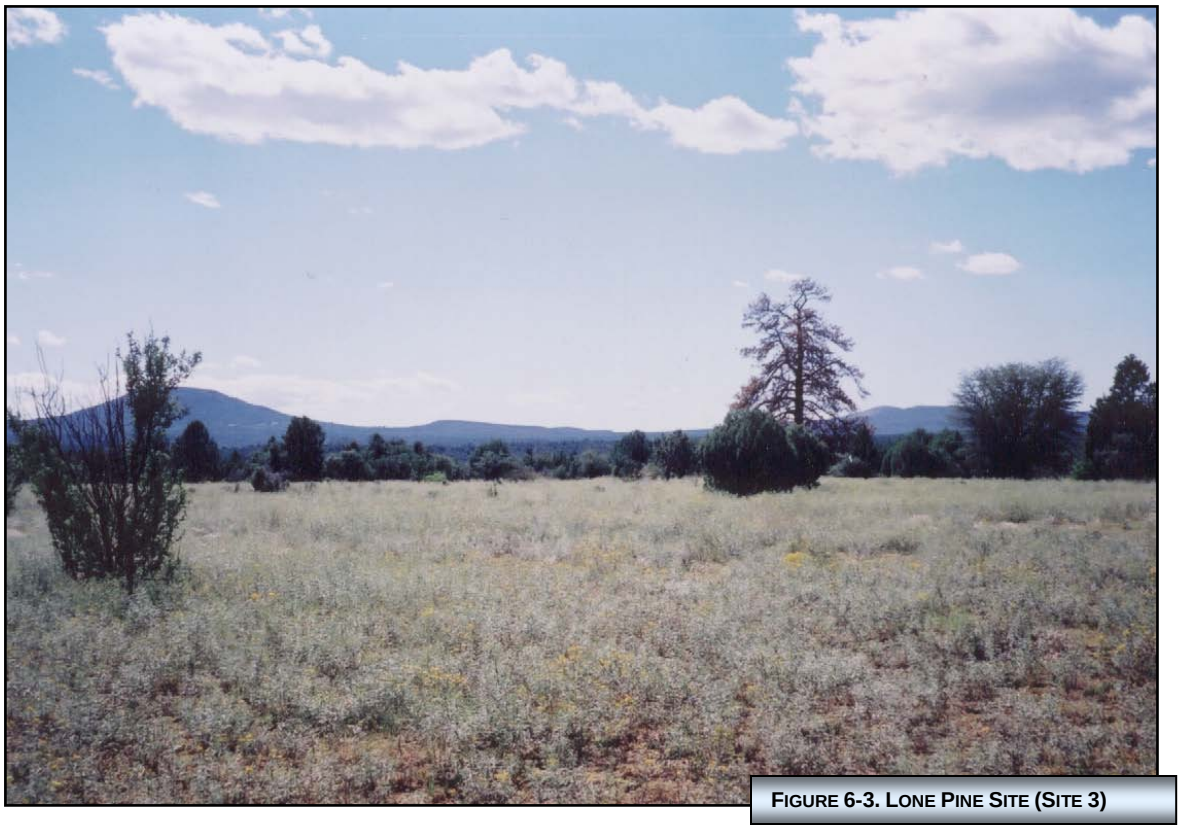


FIGURE 6-3. LONE PINE SITE (SITE 3)

ACCESS TO SUPPORTIVE INFRASTRUCTURE

Access to supportive infrastructure includes the proximity of the sites to the Cibecue area, the condition of ground access routes to the site, and access to public utilities.

Site 2B is located a ground travel distance of 2 miles southwest of Cibecue. Ground access is accomplished by driving southwest on BIA Route 12 where a dirt road provides access to the site. This dirt road crosses a previous unimproved landing strip that runs almost parallel to BIA Route 12. Ground access improvements for this site would only involve improving this dirt road for approximately 1,000 feet. Power is available at the Cibecue High School, approximately 8,000 feet east down BIA Route 12. Power would need to be extended to the site to serve the airport. Options for providing potable water for public or private facilities include drilling a well or transporting water to the site. A septic or vault system would be needed to provide sanitary facilities on the airport. Propane could be utilized as necessary for future airport facilities.

Site 3 is located a ground travel distance of 3 miles southwest of Cibecue. Ground access is accomplished by driving southwest on BIA Route 12 for 2 miles, then following an unimproved dirt road approximately 5,000 feet south and around Lonely Mountain. Ground access improvements for this site would involve improving this dirt road for approximately 5,000 feet. Power is available at the Cibecue High School, approximately 8,000 feet northeast of the site. Power would need to be extended to the site to serve the airport. Options for providing potable water for public or private facilities include drilling a well or transporting water to the site. A septic or vault system would be needed to provide sanitary facilities on the airport. Propane could be utilized as necessary for future airport facilities.

SAFETY, UTILITY, AND AIRSPACE CONSIDERATIONS

Safety and utility considerations for aircraft and passengers include an evaluation of vertical obstacles (both natural and man-made) which could cause a hazard to air navigation, land uses in the vicinity of the airport which would cause the emission of smoke, light, or radio interference which could obscure or interfere with the pilot using the airport, hazardous wildlife attractants, and the proximity to flammable, explosive, or hazardous material. Safety considerations for persons on the ground relate directly to compatible land use in the vicinity of the airport, which is discussed later in this chapter.

Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, provides imaginary surfaces surrounding airports, which should be protected from penetration by objects. These include the approach surfaces, transitional surfaces, horizontal surface, and conical surface. The surfaces were described in Chapter 1. Objects penetrating these surfaces could result in a hazard to air navigation and would affect the instrument approach minimums for the airport. The FAR Part 77 Airspace Surfaces were reviewed with respect to the proposed Phase I configuration and are shown in Figures 6-4 and 6-5. These surfaces were also reviewed with respect to the potential Phase II configuration and are shown in Figures 6-6 and 6-7. Phase II improvements include a non-precision instrument approach to the airport serving larger than utility aircraft. This significantly expands the Part 77 Airspace Surfaces, most notably the Horizontal and Approach Surfaces are extended from 5,000 feet to 10,000 feet.

The Phase I airport configuration for Site 2B results in terrain penetrations to the horizontal and conical surfaces north of the runway by terrain and a horizontal surface penetration south of the runway by Lonely Mountain (Figure 6-4). These penetrations are considered significant since they occur on both sides of the runway and would affect traffic patterns on both sides of the runway. The Phase II airport configuration results in these same penetrations in addition to an approach surface penetration at both ends of the runway (Figure 6-6). Furthermore, the ridgeline creating the terrain penetrations upon approach to Runway 21 creates low-level wind shear and downdrafts. These downdrafts cause decent rates of 1,000 to 1,500 feet per minute or more and are a serious hazard to approaching and departing aircraft flying at low altitudes. Because the prevailing winds are out of the southwest, the majority of approaches to the airport at this site would be made to Runway 21 and would have to be made over this ridgeline.

The Phase I airport configuration for Site 3 results in a terrain penetration of the horizontal surface north of the runway by Lonely Mountain and a conical surface penetration by terrain northwest of the runway (Figure 6-5). The horizontal surface penetration by Lonely Mountain is not considered significant since it occurs only on one side of the airport and could be mitigated by implementing a non-standard right hand traffic pattern to Runway 01. The Phase II airport configuration results in the same horizontal surface penetration by Lonely Mountain in addition to the 34:1 approach surface penetration by the ridgeline north of the site (Figure 6-7). This is the same ridgeline that penetrates the approach surface at Site 2B, however, the penetration is approximately 35 feet lower at Site 3. The approach surface penetration could be somewhat mitigated by implementing higher instrument approach minimums to Runway 19 at Site 3 or limiting the approach to Runway 19 to visual only. Extreme caution would be necessary when operating at night due to the rising terrain in the approach area and an obstruction light would have to be mounted on the top of the highest point of the terrain to identify the potential hazard.

POTENTIAL ENVIRONMENTAL IMPACTS

NOISE EXPOSURE

Noise analysis considerations include whether the Federal thresholds of noise exposure are exceeded, whether the 65 day-night level (DNL) noise contour extends beyond airport property, and if there are any residences, churches, schools, or hospitals within the 65 DNL noise contour.

The identification of airport generated noise impacts and implementation of noise abatement measures is a joint responsibility of airport operators and users. FAA Order 5050.4A states that "no noise analysis is needed for proposals involving Design Group I and II airplanes on utility, or transport, type airports whose forecast operations in the period covered by the Environmental Assessment do not exceed 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations . . .". Noise analysis is not required for Cibecue because the forecasts of aircraft operations do not exceed the threshold of operations stipulated in FAA Order 5050.4A.

The basic measure of noise is the sound pressure level that is recorded in decibels (dBA). The important point to understand when considering the impact of noise on communities is that equal levels of sound pressure can be measured for both high and low frequency sounds. Generally, people are less sensitive to sounds of low frequency than they are to high frequencies. An example of this might be the difference between the rumble of automobile traffic on a nearby highway and the high-pitched whine of jet aircraft passing overhead. At any location, over a period of time, sound pressure fluctuates considerably between high and low frequencies. Figure 6-8 depicts a Sound Level Comparison of different noise sources.

The orientation of both sites is such that flight tracks will pass near, but not directly over any residential areas of Cibecue. Because of this close proximity of the sites to Cibecue, a noise analysis will likely be performed during the environmental assessment of the airport. The noise contours for the potential Cibecue Airport will be prepared using the FAA Integrated Noise Model (INM) program Version 6.1. The 65 DNL contour will be determined for the existing airport configuration assuming the future 2023 operations forecast levels. The input files will include aircraft operational data, flight tracks, runway utilization and fleet mix. It is also recommended that a noise abatement program be implemented.

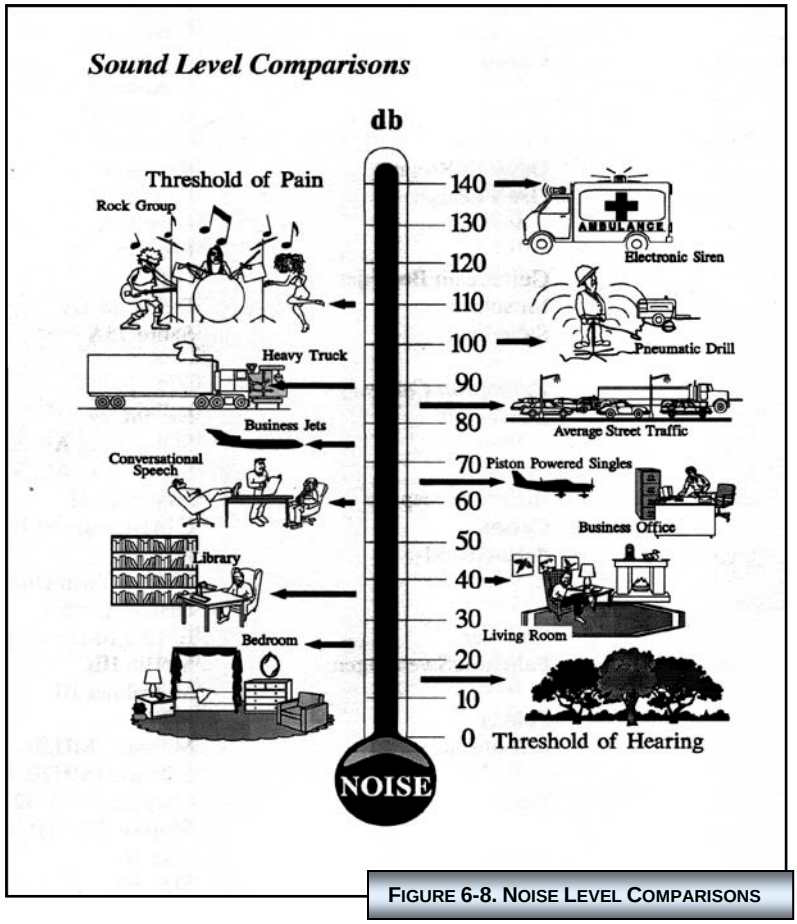


FIGURE 6-8. NOISE LEVEL COMPARISONS

VOLUNTARY NOISE ABATEMENT PROGRAM

Although the noise exposure levels will not likely exceed 65 DNL over any noise sensitive area, several voluntary measures can be applied to minimize noise exposure to surrounding areas. Several of these measures are listed below. It is recommended that a voluntary noise abatement program be implemented for the airport and publicized to all based and transient pilots.

Pilots:

- Be aware of noise sensitive areas, particularly residential areas near the airport and avoid low flight over these areas.
- Fly traffic patterns tight and high, keeping the aircraft as close to the field as possible.
- In constant-speed-propeller aircraft, do not use high RPM settings in the pattern. Propeller noise from high-performance singles and twins increases drastically at high RPM settings.
- On takeoff, reduce to climb power as soon as safe and practical.
- Climb after liftoff at best-angle-of-climb speed until crossing the airport boundary, then climb at best rate.
- Depart from the start of the runway rather than intersections, for the highest possible altitude when leaving the airport vicinity.
- Avoid prolonged run-ups, and do them inside the airport area, rather than at its perimeter.
- Try low-power approaches, and always avoid the low, dragged-in approach.

Instructors:

- Teach noise abatement procedures to all students, including pilots you take up for flight reviews.
- Know noise-sensitive areas, and point them out to students.
- Assure students fly at or above the recommended pattern altitude.
- Practice maneuvers over unpopulated areas, and vary practice areas so that the same locale is not constantly subjected to aircraft operations.
- During practice of ground-reference maneuvers, be particularly aware of houses or businesses in your flight path.
- Stress that high RPM propeller settings are reserved for takeoff and for short final but not for flying in the pattern. Pushing the propeller to high RPM results in significantly higher levels of noise.

Fixed Base Operators (FBOs):

- Identify noise-sensitive areas and work with customers to create voluntary noise abatement procedures.
- Post any noise abatement procedures in a prominently visible area, and remind pilots of the importance of adhering to them.
- Call for the use of the least noise sensitive runway whenever wind conditions permit.
- Initiate pilot education programs to teach and explain the rationale for noise abatement procedures and positive community relations.

Airport Owner and Surrounding Jurisdictions:

- Maintain appropriate zoning in the vicinity of the airport and see that noise sensitive land uses are not authorized within pattern, approach, and departure paths.
- Disclose the existence of the airport and the airport influence area to real estate purchasers.
- Publish voluntary noise procedures on the Internet.
- Publish voluntary calm runway use procedures.

Source: Aircraft Owners and Pilots Association (AOPA)

COMPATIBLE LAND USE

Land use compatibility considerations include safety, height hazards, and noise exposure (which was discussed in the previous section). Although extremely rare, most aircraft accidents occur within 5,000 feet of a runway. Therefore, the ability of the pilot to bring the aircraft down in a manner that minimizes the severity of an accident is dependent upon the type of land uses within the vicinity of the airport. Land uses are reviewed in three zones surrounding the airport: the Runway Protection Zone (RPZ), the

Approach Zone, and the Flight Pattern Zone. The RPZ is a trapezoidal area extending 1,200 feet beyond the ends of the runway and is typically included within the airport property boundary. Residential and other uses that result in congregations of people are restricted from the runway protection zone. The approach zone generally falls within the FAR Approach Surface area. Within the approach zone, public land uses, such as schools, libraries, hospitals, and churches should be avoided. New residential developments should include avigation easements and disclosure agreements. The flight pattern zone is generally the area within one mile of the airport. Within the flight pattern zone, avigation easements should be considered and disclosure statements required.

The only close populated area to both sites is the community of Cibecue approximately 2 miles northeast of the sites. The RPZ's and Approach Surfaces of both sites do not currently encompass any incompatible land uses.

Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, provides imaginary surfaces surrounding an airport that should be protected from penetration by objects. These include the approach surface, horizontal surface, and conical surface. These surfaces were described in Chapter 1. Proposed structures in the vicinity of the airport should be reviewed against the Part 77 criteria to ensure hazards to air navigation are not created. Existing obstructions to air navigation at both sites were discussed earlier in this chapter.

Any solid waste disposal facility (i.e. sanitary landfill) which is located within 5,000 feet of all runways planned to be used by piston-powered aircraft, or within 10,000 feet of all runways planned to be used by turbojets is considered by the FAA to be an incompatible land use because of the potential for conflicts between bird habitat and low-flying aircraft. This determination is found in FAA Advisory Circular 150-5200-33, *Hazardous Wildlife Attractants on or Near Airports*. There are no solid waste disposal or wastewater treatment facilities within 10,000 feet of either site. Any planned solid waste disposal facilities or wastewater treatment facilities should be located at least 10,000 feet from the runway.

SOCIAL IMPACTS

These impacts arise from the acquisition of land, relocation of persons, changes in transportation patterns, and impacts to special population groups.

Land Acquisition: All of the land under consideration for Phase I development is owned and controlled by the White Mountain Apache Tribe; hence there is no need to acquire land from private owners. At Site 2B, Phase I would require the redesignation of approximately 100 acres for aeronautical purposes while Phase II would require 30 acres. At Site 3, Phase I would require the redesignation of approximately 110 acres for aeronautical purposes while Phase II would require 30 acres for airport expansion. The land in question is currently used by the Cibecue Cattle Association for grazing activities. Upon completion of airport development at a new site, approximately 2/3 of the existing airport site will be remediated and transferred to the Cibecue Cattle Association as a replacement use. The remaining 1/3 of the existing airport site can be used as a gravel pit for material to be used for access road construction to the new airport site.

Surface Transportation Routes: The primary surface transportation route through the Cibecue area is BIA Route 12. The access route to both sites is discussed earlier in this chapter. Potential Phase II development at Site 2B would require the relocation of BIA Route 12 around the runway extension. Development of Site 3 would have no impact on surface transportation routes.

Environmental Justice: The focus of the Environmental Justice evaluation is to determine whether the project or action results in an inequitable distribution of negative effects to special population groups, as compared to negative effects on other population groups. These special population groups include minority or otherwise special ethnicity or low-income neighborhoods (below Department of Health and Human Services poverty guidelines).

The airport is not anticipated to adversely impact any special population groups, including minority or otherwise special ethnicity, or low-income neighborhoods.

Induced Socioeconomic Impacts: These secondary or indirect socioeconomic impacts involve major shifts in population, changes in economic climate, or shifts in levels of public service demand. The effects are directly proportional to the scope of the project under consideration.

Assessment of induced socioeconomic impacts is usually only associated with major development at large air carrier airports, which involve major terminal building development or roadway alignments and similar work. The extent of the indirect socioeconomic impacts of the proposed development is not of the magnitude that would normally be considered significant; however, an estimated positive annual economic impact can be foreseen in the form of direct, indirect, and induced economic benefits generated from the airport.

AIR QUALITY

Federal Aviation Administration Order 5050.4A (Chapter 5, page 33) states that no air quality analysis is needed if the airport is "a general aviation airport and has less than 180,000 operations forecast annually". The forecasts, summarized in chapter 2, estimate 2,247 annual aircraft operations by the end of the twenty-year planning period. These forecasts are well below the level defined in the FAA Order.

Construction emissions, specifically dust, are not a long-term factor. These emissions are described in the "Construction Impacts" section of this Chapter. The necessary permits will be obtained before construction begins, and construction projects will conform to FAA Advisory Circular (AC) 150-5370-10A, *Standards for Specifying Construction of Airports*.

The following best management practices are recommended to minimize construction emissions:

1 - Site Preparation
- Minimize land disturbance;
- Use watering trucks to minimize dust;
- Cover trucks when hauling dirt or debris;
- Stabilize the surface of dirt piles and any disturbed areas;
- Use windbreaks to prevent any accidental dust pollution; and
- Segregate storm water drainage from construction sites and material piles.

2 - Construction Phase
- Cover trucks when transferring materials; and
- Minimize unnecessary vehicular and machinery activities.

3 - Completion Phase
- Revegetate any disturbed land not used;
- Remove unused material and dirt piles; and
- Revegetate all disturbed areas if appropriate.

WATER QUALITY

Water quality considerations related to airport development often include increased surface runoff and erosion, and pollution from fuel, oil, solvents, and deicing fluids. Potential pollution could come from petroleum products spilled on the surface and carried through drainage channels off of the airport. State and Federal laws and regulations have been established to safeguard these facilities. These regulations include standards for above ground and underground storage tanks, leak detection, and overflow protection. An effective Storm Water Pollution Prevention Plan (SWPPP) identifies storm water discharge points on the airport, describes measures and controls to minimize discharges, and details spill prevention and response procedures. A SWPPP should be prepared and implemented by the Tribe.

In accordance with Section 402(p) of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) General Permit is required from the Environmental Protection Agency for construction projects that disturb one or more acres of land. Applicable contractors will be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent and a Storm Water Pollution Prevention Plan, prior to the initiation of construction activities.

Recommendations established in FAA Advisory Circular 150/5370-10, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion and Siltation Control,* will be incorporated into the project design and specifications. The design and construction of the proposed improvements will incorporate Best Management Practices (BMP) to reduce erosion, minimize sedimentation, control non-storm water discharges, and to protect the quality of surface water features potentially effected. These practices will be selected based on the site's characteristics and those factors within the contractor's control and may include: construction scheduling, limiting exposed areas, runoff velocity reduction, sediment trapping, and good housekeeping practices.

Fuel storage and dispensing facilities will be designed, constructed, operated, and maintained in accordance with Federal, State, and Local regulations. Waste fluids, including oils, coolants, degreasers, and aircraft wash facility wastewater will be managed and disposed of in accordance with applicable Federal, State, and Local regulations.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, & CULTURAL RESOURCES

The National Historic Preservation Act of 1966 requires that an initial review be made in order to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of a proposed action's potential environmental impact (the area within which direct and indirect impacts could occur and thus cause a change in historic, architectural, archaeological, or cultural properties). The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistorical, historical, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded, or federally licensed project.

Preliminary coordination with the Tribal Historic Preservation Officer indicates the potential for encountering cultural and heritage resources at both sites. Both sites have not previously been surveyed, however, Figure 6-1 shows the known acorn collection boundary at Site 3. All acorn collection activities have historically taken place east of this line.

A Class I literature search and pedestrian survey will be accomplished for the preferred site as part of the Environmental Assessment process. Should eligible site(s) be encountered, an effort to avoid the site will be made though minor variations in runway location or alignment. If impact to the site is unavoidable, site mitigation will be accomplished through a testing, excavation, and recording program approved by the Tribal Historic Preservation Officer. It will also be necessary to implement and follow the White Mountain Apache Tribe's Cultural Heritage Resources, Best Management Practices.

Should any cultural resources be found during construction, work in the area will be temporarily suspended in the area to allow for the evaluation and disposition of such resources. In the event of a discovery, the following procedure shall be followed: the FAA Official shall be notified as soon as possible following the discovery. The FAA Official shall notify the Tribal Historic Preservation Office within 48 hours of the request and submit final comments to the FAA Official within 30 days of the request. The FAA Official and the Historic Preservation Officer in developing a response to the discovery will follow the procedure outlined in 36 CFR 800.11.

BIOTIC COMMUNITIES

This category concerns potential impacts to existing wildlife habitat. Examining both the area of land to be altered or removed and its relationship to surrounding habitat, quantify the significance of the impacts in this category. For example, removal of a few acres of habitat which represents a small percentage of the area's total similar habitat or which supports a limited variety of common species would not be considered significant. However, removal of a sizeable percentage of the area's similar habitat, or habitat which is known to support rare species, would be considered significant impact. Developing Site 2B would remove approximately 100 acres of potential habitat. Developing Site 3 would remove approximately 110 acres of potential habitat. The surrounding area offers an abundance of similar habitat and the proposed action is not considered to be a significant habitat loss.

ENDANGERED & THREATENED SPECIES

Section 7 of the Endangered Species Act, as amended, requires each Federal agency to insure that "any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species . . .".

An *Endangered Species* is defined as any member of the animal or plant kingdoms determined to be in danger of extinction throughout all or a significant portion of its range. A *Threatened Species* is defined as any member of the plant or animal kingdoms that are likely to become endangered in the foreseeable future.

The U.S. Fish and Wildlife Service maintains a list of Threatened and Endangered species for Navajo County. That list contains the following species:

ANIMALS

Endangered:

- Black-footed ferret (Mustela nigripes)
- California Brown pelican (Pelecanus occidentalis californicus)
- California condor (Gymnogyps californianus)
- Southwestern willow flycatcher (Empidonax traillii extimus)

Threatened:

- Apache (Arizona) trout (Oncorhynchus apache)
- Bald eagle (Haliaeetus leucocephalus)
- Chiricahua lepard frog (Rana chiricahuensis)
- Little Colorado spinedace (Lepidomeda vittata)
- Loach minnow (Tiaroga cobitis)
- Mexican spotted owl (Strix occidentalis lucida)
- Spikedace (Meda fulgida)

Candidate:

- Yellow-billed cuckoo (Coccyzus americanus)

PLANTS

Endangered:

- Peebles Navajo cactus (Pediocactus peeblesianus)

Threatened:

- Navajo sedge (Carex specuicola)

While the proposed airport is not expected to impact any of the listed Threatened and Endangered species, a Biological Assessment for the airport should be conducted prior to construction. Also, barbed/woven wire fencing should be considered for installation around the airport to protect against runway incursion by animals.

WETLANDS

Wetlands are defined in Executive Order 11990, *Protection of Wetlands*, as "those areas that are inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances does or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, and natural ponds. Jurisdictional Waters of the United States may also include drainage channels, washes, ditches, arroyos, or other waterways that are tributaries to Navigable Water of the United States or other waters where the degradation or destruction of which could affect interstate or foreign commerce.

Based on site visits it does not appear that development at either site would impact any wetlands. The Phase II extension to the north at Site 2B would cross an unnamed drainage. The area would be filled to provide embankment for the runway, taxiway and associated safety areas. A culvert would be provided to maintain the function of the drainage.

FLOODPLAINS

Floodplains are defined by Executive Order 11988, Floodplain Management, as the lowland and relatively flat areas adjoining coastal water . . . including at a minimum, that area subject to a one percent or greater chance of flooding in any given year . . . ", that is, an area which would be inundated by a 100 year flood. If a proposed action involves a 100-year floodplain, mitigating measures must be investigated in order to avoid significant changes to the drainage system.

As described in FAA Order 5050.4A, *Airport Environmental Handbook*, an airport development project such as the proposed runway construction would be a significant encroachment of the 100 year floodplain if it will involve any of the following:

- A considerable probability of loss of human life;
- Likely future damage associated with the encroachment that could be substantial in cost or extent, including the interruption of service on or loss of a vital transportation facility; or
- A notable adverse impact on natural and beneficial floodplain values.

The Cibecue area has not been mapped for floodplains; however, based on site visits and analysis of aerial photography, both Sites 2B and 3 do not appear to be located in or near a floodplain.

COASTAL ZONE MANAGEMENT

There are no coastal zones associated with the proposed development. Therefore, compliance with the Coastal Zone Management Act of 1972 is not a factor.

COASTAL BARRIERS

There are no coastal barriers associated with the proposed development. Therefore, compliance with the Coastal Barriers Resources Act of 1982 is not a factor.

WILD & SCENIC RIVERS

The Wild and Scenic Rivers Act (PL 90-542) describes those river areas eligible for protection from development. As a general rule, these rivers possess outstanding scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar value. According to the Wild and Scenic River list from the National Park Service, the only wild and scenic river in Arizona is the Verde River, which is not located near Cibecue.

PRIME & UNIQUE FARMLAND

The Farmland Protection Policy Act (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture.

Conversion of "Prime or Unique" farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.

Developing either Site 2B or 3 will only disturb existing ranch land and will not disturb any prime or unique farmland.

ENERGY SUPPLY & NATURAL RESOURCES

Energy requirements associated with airport development generally fall into two categories: 1) changed demand for stationary facilities (i.e. airfield lighting and terminal building heating), and 2) those that

involve the movement of air and ground vehicles (i.e. fuel consumption). The use of natural resources includes primarily construction materials and water.

Power requirements for airfield facilities are estimated to be 20 to 25 kilowatts. However, power requirements can be significantly reduced with the installation of runway reflectors in place of runway edge lighting. Options for water supply at the potential sites include obtaining water from an existing adjacent or nearby sources, drilling an on-site well, or transporting water from off-site and storing in on-site tanks. The BIA will provide its own water for firefighting and slurry mixing activities. The construction contractor will be required to obtain and provide water for construction.

Demand for aircraft fuel is expected to increase. Aircraft fuel may be stored in above ground or underground tanks at the airport. The fuel tanks are required to conform to Environmental Protection Agency (EPA) regulations. The fuel concession may be provided by the Tribe or by a private enterprise at the airport. A significant increase in ground vehicle fuel consumption is not anticipated.

LIGHT EMISSIONS

Airfield lighting is the main source of light emissions emanating from an airport. Rotating airport beacons are provided so pilots can identify the location of an airport at night or in reduced visibility conditions. Rotating beacons consist of alternating white and green lights rotating at six rotations per minute. Beacons are typically mounted on a tower or on top of a hangar or other building. Specifications for spotting airport beacons allow the beam to be angled from 2^{o} to 12^{o} above the horizon. The standard setting is 6^{o}. If necessary, the beacon can be shielded to reduce visibility of the beacon from below the horizon line. Medium Intensity Runway Edge Lights (MIRLs) are single white lights mounted on 18-inch posts spaced at 200-foot intervals along both edges of the runway. They define the boundaries of the runway surface usable for takeoff and landing. Precision Approach Path Indicators (PAPIs) are used for visual decent guidance and consist of two light units located to the left of the runway and perpendicular to the runway centerline. The lights are directed at a glide path angle of 3^{o} above the runway. If the aircraft is above the glide path, the pilot will see all white lights. If the pilot is on the proper glide path, the light unit closest to the runway will be red and the unit farthest from the runway will be white. When the pilot is below the glide path both of the light units will be red. PAPIs have an effective visual range from the air of approximately five miles during the day and up to twenty miles at night. These visual aids are extremely useful and enhance safety in situations where there are few visual references surrounding the airport. Runway End Identifier Lights (REILs) are synchronized flashing lights located laterally on each side of the runway threshold. They are angled upward and outward from the runway and provide rapid and positive identification of the threshold of a runway. This is especially useful in metropolitan and densely developed areas where lights in the vicinity of the airport make it difficult to identify the runway. Although useful for identification of the runway there are few other light sources that would conflict with airfield lighting or make it difficult to identify the runway; therefore, REILs are not considered essential.

In Phase I, runway and taxiway reflectors may be installed in place of airport lighting. The only light emissions resulting from these reflectors is the direct reflection back to the pilot from the aircraft landing lights. Proposed visual aids at both sites would consist of runway edge lighting or runway reflectors, precision approach path indicators, and an airport beacon. These visual aids are not expected to cause negative light emission impacts.

SOLID WASTE IMPACT

Airport development actions that relate only to construction or expansion of runways, taxiways, and related facilities do not normally include any direct relationship to solid waste collection, control, or disposal other than that associated with the construction itself. The nature of the proposed airport meets these criteria and will not significantly increase net waste output for the community.

Any solid waste disposal facility (i.e. sanitary landfill) which is located within 5,000 feet of all runways planned to be used by piston-powered aircraft, or within 10,000 feet of all runways planned to be used by turbojets, is considered by the FAA to be an incompatible land use because of the potential for conflicts between bird habitat and low-flying aircraft. This determination is found in FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. There are no solid waste disposal

facilities within 10,000 feet of the airport. Any planned solid waste disposal facilities should be located at least 10,000 feet from the runway.

CONSTRUCTION IMPACTS

Construction operations for the proposed development will cause specific impacts resulting solely from and limited exclusively to the construction period. Construction impacts are distinct in that they are temporary in duration, and the degree of adverse impacts decreases as work is concluded. The following construction impacts can be expected:

- A temporary increase in particulate and gaseous air pollution levels as a result of dust generated by construction activity and by vehicle emissions from equipment and worker's automobiles;
- Increases in solid and sanitary wastes from the workers at the site;
- Traffic volumes that would increase in the airport vicinity due to construction activity (workers arriving and departing, delivery of materials, etc.);
- Increase in noise levels at the airport during operation of heavy equipment; and
- Temporary erosion, scarring of land surfaces, and loss of vegetation in areas that are excavated or otherwise disturbed to carry out future developments.

All construction projects will comply with guidelines set forth in FAA Advisory Circular 150/5370-10A, *Standards for Specifying the Construction of Airports*. The contractor will obtain the required construction permits. The contractor will also prepare Storm Water Pollution Prevention and Fugitive Dust Control Plans for construction. These requirements will be specified in the contract documents for the construction of the runway and associated facilities.

MEANS TO MITIGATE AND/OR MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS

Where appropriate, the mitigation or minimization of environmental impacts was noted in the discussion of impacts. These actions are summarized below:

- Implement a voluntary Noise Abatement and Awareness Program for aircraft operations;
- Maintain compatible land uses in the vicinity of the airport;
- Establish a right-hand traffic pattern to Runway 01 at Site 3 to prevent over flight of Lonely Mountain;
- Conduct Cultural Resource Survey and avoid any historic or cultural sites during construction;
- Implement White Mountain Apache Tribe's Cultural Heritage Resource Best Management Practices;
- Conduct Biological Assessment;
- Adjust airport rotating beacon beam angles to avoid terrain. Shield lower beam angles if necessary;
- Utilize pilot controlled lighting on all airfield lighting and visual aids. Utilize timers or motion sensors for apron and automobile parking area lights;
- Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention and Response Plan; and
- Adhere to FAA AC 150/5370-10A, *Standards for Specifying the Construction of Airports*, and best management practices to minimize or eliminate impacts to water quality and air quality during construction;

ESTIMATED DEVELOPMENT COSTS

Future airport development, as included in this study, covers a twenty-year period. Development items are grouped into two phases. Phase I is short-term (0–5 years) and Phase II is long-term (6–20 years). Each phase is further divided into Fundamental Airport Development and Related Airport Development items. Fundamental Airport Development items are the minimum essential items needed for the operation of the facility as proposed in each Phase. These items would be eligible for FAA grant funding and comprise the cost of the airfield operations and aircraft parking areas, airfield lighting and visual aids, and vehicle access. Related Airport Development items are those items that support aviation activity at

the airport. These are primarily private enterprise developments and include aircraft storage hangars, fuel storage and dispensing facilities, and other aviation related businesses. These items are generally not eligible for FAA grant funding and typically generate revenue for the airport. Proposed improvements are based on the recommended facility requirements discussed in Chapter 3. The estimated costs for airport development are listed in Tables 6-1 and 6-2.

TABLE 6-1 ESTIMATED AIRPORT DEVELOPMENT COSTS

SHORT-TERM (0-5 Years) Description	Site 2B	Site 3
Fundamental Development Items		
Environmental Assessment	$140,000	$140,000
Construct Access Road	$95,000	$279,000
Earthwork for Runway	$470,000	$360,000
Pave Runway (5,100' x 75')	$847,500	$847,500
Earthwork for Taxiway	$140,000	$80,000
Construct Partial Parallel Taxiway and Bypass Taxiway	$220,000	$220,000
Construct Aircraft Parking Apron and Tie Downs	$405,500	$405,500
Install Airfield Lighting, Signage and Visual Aids	$482,000	$482,000
Install Fencing and Gates	$138,000	$138,000
Install Super Unicom	$69,000	$69,000
Construct Utilities	$199,000	$199,000
Construct Helicopter Parking Area	$150,000	$150,000
Construct Air Tanker Loading Area	$160,000	$160,000
Construct Vehicle Parking	$52,000	$52,000
Install GPS Approach	$7,000	$7,000
Total-Fundamental Airport Development	$3,575,000	$3,589,000
Related Development Items		
Purchase Jet A Fuel Truck	$21,000	$21,000
Construct FBO/Hangar/Pilots Lounge	$344,000	$344,000
Purchase ARFF Vehicle/Snow Sweeper and Storage Building	$481,000	$481,000
Total-Related Airport Development	$846,000	$846,000
TOTAL SHORT-TERM (0-5 Years)	**$4,421,000**	**$4,435,000**
LONG-TERM (6-20 Years)		
Fundamental Development Items		
Earthwork for Runway and Taxiway Extension	$360,000	$280,000
Runway and Taxiway Extension (to 7,640') Paving, Lighting, etc	$1,412,000	$1,412,000
Strengthen Pavements to 30,000 lbs	$970,000	$970,000
Apron Expansion	$120,000	$120,000
Fencing	$38,000	$38,000
Total-Fundamental Airport Development	$2,900,000	$2,820,000
Related Development Items		
Corporate Hangar	$495,000	$495,000
10 T-Hangars	$275,000	$275,000
Total-Related Airport Development	$770,000	$ 770,000
TOTAL LONG-TERM (6-20 Years)	**$3,670,000**	**$3,590,000**
TOTAL 20-YEAR PLANNING PERIOD	**$8,091,000**	**$8,025,000**

Notes:
All costs in FY 2004 dollars. Includes engineering, administration and contingency. Cost estimates based on configuration of airfield facilities depicted on conceptual airport layout for each site and bids received on projects of similar nature. Actual costs will be based on final engineering design and contractor bid prices at the time of construction. Airport operations and maintenance costs not included.

TABLE 6-2 CAPITAL IMPROVEMENT COST SHARE BREAKDOWN

Description	Total	FAA	Sponsor
SHORT-TERM (0-5 Years)			
Fundamental Airport Development			
Site 2B	$3,575,000	$3,396,250	$178,750
Site 3	$3,589,000	$3,409,550	$179,450
LONG-TERM (6-20 Years)			
Fundamental Airport Development			
Site 2B	$2,900,000	$2,750,000	$145,000
Site 3	$2,820,000	$2,679,000	$141,000

SUMMARY

The following matrix summarizes the results for the two sites under consideration for development. Although some items are indicated as marginal, these items do not exceed significant thresholds and can be overcome through planning or engineering solutions. Based on this analysis, the Lone Pine Site (Site 3) is the preferred site to develop the Cibecue Airport.

TABLE 6-3 REFINED SITE EVALUATION MATRIX

	Site 2B	Site 3
Ability to Accommodate Airfield Facilities and Aviation Related Development	◉	○
Engineering Considerations	○	○
Access to Supportive Infrastructure	◉	◉
Safety and Airspace Considerations	●	◉
Environmental Overview		
Noise	○	○
Compatible Land Use	○	○
Social Impacts	◉	○
Induced Socioeconomic Impacts	○	○
Air Quality	○	○
Water Quality	○	○
Construction Impacts	◉	◉
Historical, Architectural, Archaeological, Cultural Resources	◉	◉
Biotic Communities	○	○
Endangered & Threatened Species	○	○
Wetlands & Jurisdictional Waters of the United States	○	○
Floodplains	○	○
Wild & Scenic Rivers	○	○
Prime & Unique Farmland	○	○
Energy Supply & Natural Resources	○	○
Light Emissions	○	○
Solid Waste Impacts	○	○
Estimated Development Costs	○	○

Legend:
○ Meet Criteria
◉ Marginal
● Does Not Meet Criteria

CONCLUSIONS AND RECOMMENDATIONS

PRELIMINARY SITE ANALYSIS

The screening criteria listed below were utilized to identify and provide and initial evaluation of potential airport sites. A rating of Meets Criteria, Marginal, or Does Not Meet Criteria was assigned to each criterion for each site.

1) Location (proximity to Cibecue)
2) Soil Type
3) Terrain features that would preclude airport development
4) Runway alignment with prevailing winds
5) Site layout
6) Airspace
7) Other factors (safety, access, wind shear, Tribal departmental comments)

The following list of preliminary candidate sites was formulated from the initial screening criteria listed above and input from the Airport Technical Advisory Committee (ATAC).

Site 1) Caddo Point Site
Site 2) Landing Strip Site A
Site 2B) Landing Strip Site B
Site 3) Lone Pine Site
Site 4) Cibecue Canyon Site
Site 5) Wildhorse Tank Site

Based on the results of the analysis of the six sites with respect to the initial screening criteria, two candidate sites were carried forward for further evaluation and include:

Site 2B) Landing Strip Site B
Site 3) Lone Pine Site

REFINED SITE ANALYSIS

Each of the two candidate sites were evaluated with respect to each of the criteria listed below:

1) Ability to accommodate airfield facilities and aviation related development
2) Engineering Considerations
3) Access to Supportive Infrastructure
4) Safety, Utility, and Airspace Considerations
5) Potential Environmental Impacts
6) Estimated Development Costs

The Landing Strip Site B or Site 2B is constrained with respect to potential future development and has significant safety and airspace considerations. The primary concern at Site 2B is the high terrain on both sides of the runway. The engineering considerations, access to infrastructure, potential environmental impacts and estimated development costs at Site 2B are all very similar to Site 3.

The Lone Pine Site or Site 3 has the ability to accommodate the proposed development. The site offers appropriate topography to minimize earthwork requirements and development costs. There are airspace considerations at Site 3 as well, however, these terrain penetrations can be avoided by publishing a non-standard right hand pattern to south end of the runway. Environmental impacts are anticipated to be minimal at Site 3. Consequently, Site 3 is recommended for development of the Cibecue Airport. Upon completion of development at Site 3, the existing airport site will be remediated and transferred back to the Cibecue Cattle Association as a replacement land use.

NEXT STEPS

The next steps in the development process include the following. The Airport Layout Plan portion of the study will commence immediately upon receipt of the notice to proceed from the Tribe. A grant application has been submitted to the FAA for funding the environmental assessment with fiscal year 2004 general aviation entitlement funds. The design and construction timeframe will depend on the availability of FAA funds.

- Airport Layout Plans (Included in existing FAA grant)
- Environmental Assessment
- Dedication of Land by White Mountain Apache Tribe
- Design Engineering
- Bidding and Construction

Chapter Seven
Capital Improvement Program (CIP)

Cibecue Airport Master Plan

Chapter Seven
Capital Improvement Program (CIP)

INTRODUCTION

A program of recommended airport development for the Cibecue Airport has been formulated to guide the sponsor in the systematic development of the airport and to aid the Federal Aviation Administration and Tribe in allocating funding over the planning period. In Arizona, projects eligible for Airport Improvement Program (AIP) participation are normally funded at 95 percent by the FAA and 5 percent by the Sponsor. The grant eligible items typically include airfield and aeronautical related facilities such as runways, taxiways, aprons, lighting and visual aids as well as land acquisition and environmental tasks needed to accomplish the improvements. The public use (non-revenue generating) portions of passenger terminals are also grant eligible. In addition, recent AIP legislation has made previously non-eligible items such as fuel systems, hangars and pilot lounges eligible, however, these items are considered a low priority. Because these related airport development items are now eligible, they are shown with FAA funding in the Capital Improvement Program.

CAPITAL IMPROVEMENT PROGRAM (CIP)

Future airport development for the Cibecue Airport, as included in this study, covers a twenty-year period. Development items are grouped into two phases. Phase I is short-term (0-5 years) and Phase II is long-term (5-20 years). Estimated development costs are based on the proposed improvements (as shown on the airport layout plan) and are included for each item in the Capital Improvement Program (CIP). Proposed improvements are based on the recommended facility requirements discussed in Chapter 3. The phasing of projects assists the airport sponsor in budgetary planning for construction projects.

Phase I Fundamental Development Items
Environmental Assessment
Construct Access Road
Earthwork for Runway
Pave Runway (5,100' x 75')
Earthwork for Taxiway
Construct Partial Parallel Taxiway and Bypass Taxiway
Construct Aircraft Parking Apron and Tie Downs
Install Airfield Lighting, Signage and Visual Aids
Install Fencing and Gates
Install Super Unicom
Construct Utilities
Construct Helicopter Parking Area
Construct Air Tanker Loading Area
Construct Vehicle Parking
Install GPS Approach

Phase I Related Development Items
Purchase Jet A Fuel Truck
Construct FBO/Hangar/Pilots Lounge
Purchase ARFF Vehicle/Snow Sweeper and Storage Building

Phase II Fundamental Development Items
Earthwork for Runway and Taxiway Extension
Runway and Taxiway Extension, Paving, Lighting, etc.
Strengthen Pavements to 30,000 lbs
Apron Expansion
Fencing

Phase II Related Development Items
Construct Corporate Hangar
Construct 10 T-hangars

TABLE 7-1 20-YEAR CAPITAL IMPROVEMENT PROGRAM

Phase I, Short-Term Development Items (0-5 Years) Description	TOTAL	FAA	SPONSOR
Fundamental Development Items			
Environmental Assessment	$140,000	$133,000	$7,000
Construct Access Road	$95,000	$90,250	$4,750
Earthwork for Runway	$470,000	$446,500	$23,500
Pave Runway (5,100' x 75')	$847,500	$805,125	$42,375
Earthwork for Taxiway	$140,000	$133,000	$7,000
Construct Partial Parallel Taxiway and Bypass Taxiway	$220,000	$209,000	$11,000
Construct Aircraft Parking Apron and Tie Downs	$405,500	$385,225	$20,275
Install Airfield Lighting, Signage and Visual Aids	$482,000	$457,900	$24,100
Install Fencing and Gates	$138,000	$131,100	$6,900
Install Super Unicom	$69,000	$65,550	$3,450
Construct Utilities	$199,000	$189,050	$9,950
Construct Helicopter Parking Area	$150,000	$142,500	$7,500
Construct Air Tanker Loading Area	$160,000	$152,000	$8,000
Construct Vehicle Parking	$52,000	$49,400	$2,600
Install GPS Approach	$7,000	$6,650	$350
Total-Fundamental Development Cost	$3,575,000	$3,396,250	$178,750
Related Development Items			
Purchase Jet A Fuel Truck	$21,000	$19,950	$1,050
Construct FBO/Hangar/Pilots Lounge	$344,000	$326,800	$17,200
Purchase ARFF Vehicle/Snow Sweeper/Storage Building	$481,000	$456,950	$24,050
Total-Related Airport Development	$846,000	$803,700	$42,300
TOTAL SHORT TERM	**$4,421,000**	**$4,199,950**	**$221,050**
Phase II, Long-Term Development Items (5-20 Years)			
Fundamental Development Items			
Earthwork for Runway and Taxiway Extension	$360,000	$342,000	$18,000
Runway and Taxiway Extension, Paving, Lighting, etc.	$1,412,000	$1,341,400	$70,600
Strengthen Pavements to 30,000 lbs	$970,000	$921,500	$48,500
Apron Expansion	$120,000	$114,000	$6,000
Fencing	$38,000	$36,100	$1,900
Total Fundamental Airport Development	$2,900,000	$2,755,000	$145,000
Related Development Items			
Construct Corporate Hangar	$495,000	$470,250	$24,750
Construct 10 T-hangars	$275,000	$261,250	$13,750
Total-Related Airport Development	$770,000	$731,500	$38,500
TOTAL LONG TERM (6-20 Years)	**$3,670,000**	**$3,486,500**	**$183,500**
TOTAL 20-YEAR PLANNING PERIOD	**$8,091,000**	**$7,686,450**	**$404,550**

Notes:
All Costs in FY 2005 dollars. Includes engineering, administration and contingency. Actual costs will be based on final engineering design and contractor bid prices at the time of construction. Airport operations and maintenance costs not included.

CAPITAL DEVELOPMENT

Federal Grant Assistance: The phasing of projects assists the airport sponsor in budgetary planning for construction improvements that are needed to provide safe and functional facilities for aviation demands. Phased development schedules also assist the airport sponsor in contingencies and construction. Table 5-1 assumes that the Federal Aviation Administration will participate with funding from the Airport Improvement Program (AIP) of 95 percent of eligible items. The White Mountain Apache Tribe would then be responsible for providing 5 percent matching funds for grant eligible projects. The Tribe may meet its local share requirements through cash, in-kind service, force-account, donations, or private/third party participation.

The Airport and Airways Act of 1982 created and authorized the Airport Improvement Program (AIP) to assist in the development of a nationwide system of public-use airports adequate to meet the current projected growth of civil aviation. The Act provides funding for airport planning and development projects at airports such as the Cibecue Airport that are included in the National Plan of Integrated Airport Systems (NPIAS).

Funding The Local Share: The airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs. The most common methods involve debt financing which amortize the debt over the useful life of the project, force accounts, in-kind service, third-party support and donations.

Bank Financing: Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required. First, the sponsor must show the ability to repay the loan plus interest and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions that are applied to almost all bank loan transactions.

General Obligation Bonds: General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Self-liquidating General Obligation Bonds: As with General Obligation bonds, Self-liquidating General Obligation Bonds are secured by the issuing government agency. They are retired, however, by cash flow from the operation of the facility. Providing the state court determines that the project is self-sustaining, the debt may be legally excluded from the community's debt limit. Since the credit of the local government bears the ultimate risk of default, the bond issue is still considered, for the purpose of financial analysis, as part of the debt burden of the community. Therefore, this method of financing may mean a higher rate of interest on all bonds sold by the community. The amount of increase in the interest rate depends, in part, upon the degree of risk of the bond. Exposure risk occurs when there is insufficient net airport operating income to cover the level of service plus coverage requirements, thus forcing the community to absorb the residual.

Revenue Bonds: Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

Combined Revenue/General Obligation Bonds: These bonds, also known as "Double-Barrel Bonds", are secured by a pledge of back-up tax revenues to cover principal and interest payments in cases where airport revenues are insufficient. The combined Revenue/General Obligation Bond interest rates are usually lower than Revenue Bonds, due to their back-up tax provisions.

Force Accounts, In-kind Service, Donations: Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways, taxiways; the installation of fencing; or the construction of improvements to access roads. In-kind service may include surveying, engineering or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support: Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (Pilot Associations, Economic Development Associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. Because of the potential for hangar development, private developers may be persuaded to invest in hangar development. A suggestion would be that the Tribe authorizes long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor’s capital investment requirements. Another method of third-party support involves permitting a fixed base operator (FBO) to construct and monitor facilities on property leased from the airport. Terms of the lease generally include a fixed amount plus a percentage of revenues and a fuel flowage fee. The advantage to this arrangement is that it lowers the sponsor’s development costs, a large portion of which is building construction and maintenance.

Chapter Eight
Airport Layout Plans

Cibecue Airport Master Plan

Chapter Eight
Airport Layout Plans

INTRODUCTION

This set of plans, referred to as the Airport Layout Plan (ALP), has been prepared in accordance with Federal Aviation Administration (FAA) Advisory Circular 5300-13, Change 8, *Airport Design*, the FAA, Western-Pacific Regional ALP checklist as well as the State of Arizona, Aeronautics Department, ALP checklist. The purpose of this set of plans is to graphically depict the recommendations for the airport layout, disposition of obstructions and future use of land in the vicinity of the airport.

- Cover Sheet
- Airport Layout Plan Drawing
- Terminal/Building Area Plan Drawing
- Inner Portion of the Approach Surface Drawing
- Airport Airspace Drawing
- On Airport Land Use Drawing
- Off Airport Land Use Drawing
- Exhibit “A” Property Map
- Aerial Photograph

In addition to the Airport Layout Plan drawing set, a model zoning ordinance and avigation easement guide has been prepared and is included in Appendix C.

Cibecue Airport

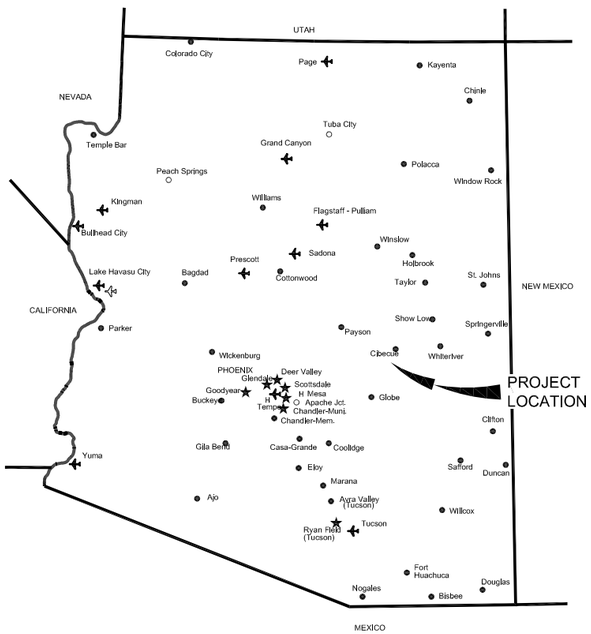
Cibecue, Arizona

AIRPORT LAYOUT PLANS

PREPARED BY: ARMSTRONG CONSULTANTS, INC.
A.C.I. PROJECT NO. 035674
A.I.P. NO. 3-04-0079-01
June 14, 2006

AIRPORT SPONSOR
WHITE MOUNTAIN APACHE TRIBE

VICINITY MAP



Arizona
LOCATION MAP

INDEX TO SHEETS

(I) INITIAL (F) FUTURE

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5674501

RUNWAY DATA	1/19	1/19
	INITIAL (I)	FUTURE (F)
PART 77 CATEGORY RW 1 / RW 19	Visual (B) / NPI (C)	Visual (B) / NPI (C)
FAR PART 77 APPROACH SLOPE	RW 1 - 20:1 / RW 19 - 34:1	RW 1 - 20:1 / RW 19 - 34:1
RUNWAY LENGTH	5,100'	7,640'
RUNWAY WIDTH	75'	75'
RUNWAY PAVEMENT TYPE	ASPHALT	ASPHALT
TAXIWAY PAVEMENT TYPE	ASPHALT	ASPHALT
PAVEMENT STRENGTH (LBS)	16,000 SWG	30,000 SWG/ 45,000 DWG
RUNWAY LIGHTING	MIRL	MIRL
RUNWAY MARKING	RW 1- VISUAL / RW 19- NPI	RW 1- VISUAL / RW 19- NPI
% EFFECTIVE GRADIENT	.36 %	.52 %
% MAXIMUM GRADE	.5 %	.8 %
LINE OF SITE REQUIREMENTS MET	YES	YES
VISUAL AIDS	RW 1: PAPI-2/ REILs / RW 19: PAPI-2/ REILs	RW 1: PAPI-2/ REILs / RW 19: PAPI-2/ REILs
NAVIGATIONAL AIDS	GPS	GPS
AIRPORT REFERENCE CODE (ARC)	B-II	B-II
RUNWAY SAFETY AREA: WIDTH / LENGTH BEYOND RWY ENDS	150' / 300'	150' / 300'
RUNWAY OBJECT FREE AREA: WIDTH / LENGTH BEYOND RWY ENDS	500' / 300'	500' / 300'
RUNWAY/ TAXIWAY SEPARATION	300'	300'
OBSTACLE FREE ZONE: WIDTH / LENGTH BEYOND RWY ENDS	400' / 200'	400' / 200'
	NO OFZ OBJECT PENETRATIONS	
RUNWAY ELEVATIONS (NAVD 88)	RW 1 / RW 19	RW 1 / RW 19
RUNWAY END	5,204.0' / 5,184.0'	5,210.0' / 5,167.0'
TOUCHDOWN ZONE	5,204.0' / 5,204.0'	5,210.0' / 5,205.0'
HIGH POINT	5,204.0'	5,210.0'
LOW POINT	5,184.0'	5,170.0'
DISTANCE FROM RWY C/L TO HOLD BARS AND SIGNS	200'	200'
WIND COVERAGE/ 10.5 kts/ 12 mph	98.4%	98.4%
13 kts/ 15 mph	99.9%	99.9%
16 kts/ 18 mph	100%	100%
20 kts/ 23 mph	100%	100%
TAXIWAY TO FIXED OBJECT	65.5'	65.5'
TAXIWAY OFA WIDTH	131'	131'
TAXIWAY SAFETY AREA WIDTH	79'	79'

NOTES

1. NO THRESHOLD SIGHTING SURFACE PENETRATIONS.
2. BASE MAPPING AND NAD 83 COORDINATES SCALED FROM 7.5 MINUTE U.S.G.S. QUAD'S. DATED 1977, UNTIL A SURVEY CAN BE ORDERED.
3. THE EXISTING CIBECUE AIRPORT IS NOT SHOWN. THE INITIAL (I) AND FUTURE (F) LAYOUTS OF THE RELOCATED FACILITY ARE SHOWN.
4. TERRAIN PENETRATIONS NORTH OF AIRPORT MAY LIMIT POTENTIAL INSTRUMENT APPROACH MINIMUMS.
5. ALL ELEVATIONS PROVIDED IN NAVD 88.
6. SHADED AREAS REFLECT PLANNED INTIAL CONSTRUCTION. DASHED / HATCHED AREAS SHOW POTENTIAL FUTURE DEVELOPMENT.
7. FOR PLANNING PURPOSES ONLY - NOT FOR CONSTRUCTION.

APPROVED MODIFICATIONS TO STANDARDS

NONE

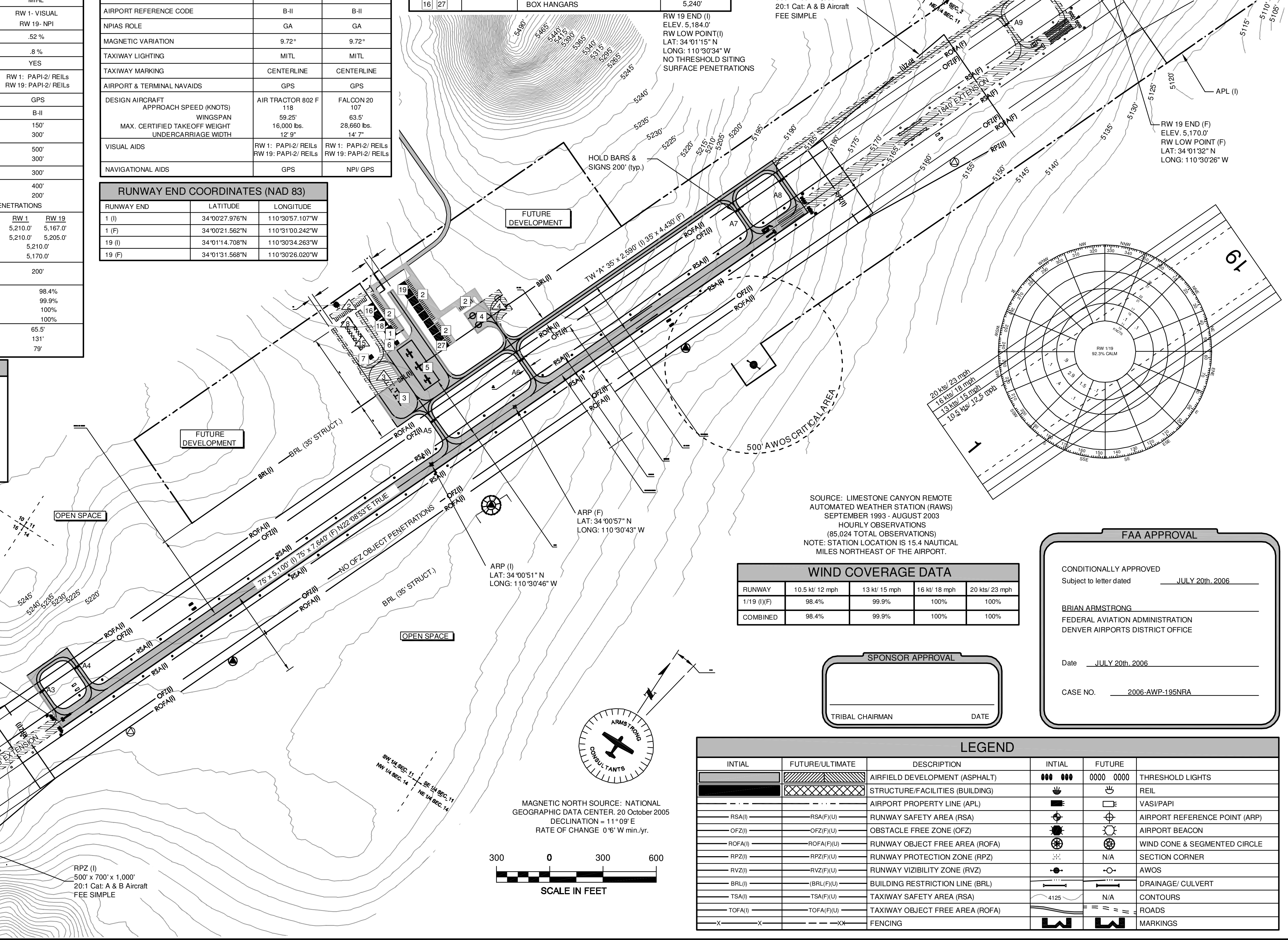
NONSTANDARD CONDITIONS

NONE

AIRPORT DATA		
AIRPORT NAME	CIBECUE AIRPORT	
AIRPORT IDENTIFIER	Z95	
COUNTY/ STATE	NAVAJO COUNTY, ARIZONA	
AIRPORT IS LOCATED IN SECTIONS 2, 11, 14 & 15; T. 7 N, R. 17 E GILA AND SALT RIVER MERIDIAN, 3 N.M. SW OF THE TOWN OF CIBECUE, ARIZONA		
	INITIAL	FUTURE
AIRPORT ELEVATION (NAVD 88)	5,204'	5,210'
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83) LAT / LONG	34°00'51.342" N / 110°30'45.686"W	34°00'56.565" N / 110°30'43.133" W
MEAN MAX. TEMP: HOTTEST MONTH (JULY)	91.3°	91.3°
AIRPORT REFERENCE CODE	B-II	B-II
NPIAS ROLE	GA	GA
MAGNETIC VARIATION	9.72°	9.72°
TAXIWAY LIGHTING	MITL	MITL
TAXIWAY MARKING	CENTERLINE	CENTERLINE
AIRPORT & TERMINAL NAVAIDS	GPS	GPS
DESIGN AIRCRAFT	AIR TRACTOR 802 F	FALCON 20
APPROACH SPEED (KNOTS)	118	107
WINGSPAN	59.25'	63.5'
MAX. CERTIFIED TAKEOFF WEIGHT	16,000 lbs.	28,660 lbs.
UNDERCARRIAGE WIDTH	12' 9"	14' 7"
VISUAL AIDS	RW 1: PAPI-2/ REILs / RW 19: PAPI-2/ REILs	RW 1: PAPI-2/ REILs / RW 19: PAPI-2/ REILs
NAVIGATIONAL AIDS	GPS	NPI/ GPS

RUNWAY END COORDINATES (NAD 83)		
RUNWAY END	LATITUDE	LONGITUDE
1 (I)	34°00'27.976"N	110°30'57.107"W
1 (F)	34°00'21.562"N	110°31'00.242"W
19 (I)	34°01'14.708"N	110°30'34.263"W
19 (F)	34°01'31.568"N	110°30'26.020"W

AIRPORT FACILITIES LIST			
INITIAL	FUTURE	FACILITY DESCRIPTION	ELEVATION
1		TERMINAL	5,245'
2	2	AUTOMOBILE PARKING	---
3	3	AIRCRAFT TIE DOWNS	----
4	4	HELICOPTER PARKING PADS	----
5		SLURRY LOADING PAD	----
6		SLURRY TANKS	---
7		FUEL TANKS	---
	8 15	T- HANGARS	5,235'
16 27		BOX HANGARS	5,240'



SOURCE: LIMESTONE CANYON REMOTE AUTOMATED WEATHER STATION (RAWS)
SEPTEMBER 1993 - AUGUST 2003
HOURLY OBSERVATIONS
(85,024 TOTAL OBSERVATIONS)
NOTE: STATION LOCATION IS 15.4 NAUTICAL MILES NORTHEAST OF THE AIRPORT.

WIND COVERAGE DATA				
RUNWAY	10.5 kt/ 12 mph	13 kt/ 15 mph	16 kt/ 18 mph	20 kts/ 23 mph
1/19 (I)(F)	98.4%	99.9%	100%	100%
COMBINED	98.4%	99.9%	100%	100%

SPONSOR APPROVAL

TRIBAL CHAIRMAN DATE

FAA APPROVAL

CONDITIONALLY APPROVED
Subject to letter dated JULY 20th. 2006

BRIAN ARMSTRONG
FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORTS DISTRICT OFFICE

Date JULY 20th. 2006

CASE NO. 2006-AWP-195NRA

LEGEND					
INTIAL	FUTURE/ULTIMATE	DESCRIPTION	INTIAL	FUTURE	
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(I)	RSA(F)(U)	RUNWAY SAFETY AREA (RSA)			AIRPORT REFERENCE POINT (ARP)
OFZ(I)	OFZ(F)(U)	OBSTACLE FREE ZONE (OFZ)			AIRPORT BEACON
ROFA(I)	ROFA(F)(U)	RUNWAY OBJECT FREE AREA (ROFA)			WIND CONE & SEGMENTED CIRCLE
RPZ(I)	RPZ(F)(U)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
RVZ(I)	RVZ(F)(U)	RUNWAY VIZIBILITY ZONE (RVZ)			AWOS
BRL(I)	(BRL(F)(U)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/ CULVERT
TSA(I)	TSA(F)(U)	TAXIWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
TOFA(I)	TOFA(F)(U)	TAXIWAY OBJECT FREE AREA (ROFA)			ROADS
X X	XX	FENCING			MARKINGS

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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

No.	Revision	Date	By
0	INTIAL ALP PREPERATION	6/14/06	RF

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982 AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIROMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

Project No: 035674
Date: 06.14.06
File Name: 5674502

Drawn: RF
Checked: REH
Approved: DAC

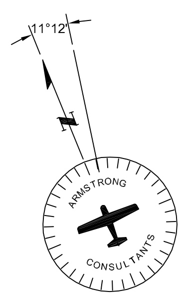
AIRPORT LAYOUT PLAN

LEGEND

INTIAL	FUTURE/ULTIMATE	DESCRIPTION	INTIAL	FUTURE	
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(I)	RSA(F)(U)	RUNWAY SAFETY AREA (RSA)			AIRPORT REFERENCE POINT (ARP)
OFZ(I)	OFZ(F)(U)	OBSTACLE FREE ZONE (OFZ)			AIRPORT BEACON
ROFA(I)	ROFA(F)(U)	RUNWAY OBJECT FREE AREA (ROFA)			WIND CONE & SEGMENTED CIRCLE
RPZ(I)	RPZ(F)(U)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
RVZ(I)	RVZ(F)(U)	RUNWAY VIZIBILITY ZONE (RVZ)			AWOS
BRL(I)	(BRL(F)(U)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/ CULVERT
TSA(I)	TSA(F)(U)	TAXIWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
TOFA(I)	TOFA(F)(U)	TAXIWAY OBJECT FREE AREA (ROFA)			ROADS
x x	xx xx	FENCING			MARKINGS

AIRPORT FACILITIES LIST

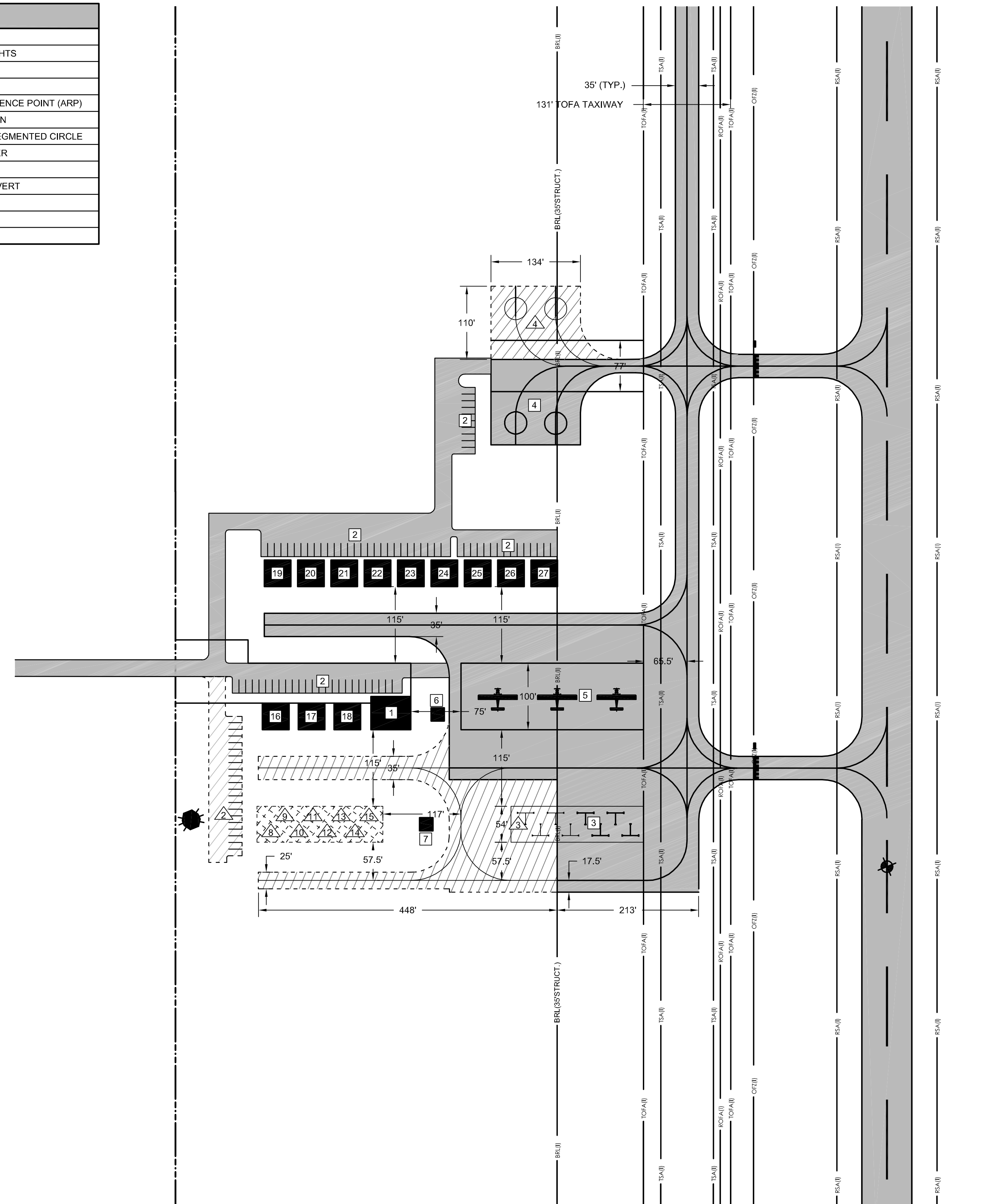
INITIAL	FUTURE	FACILITY DESCRIPTION	ELEVATION
1		TERMINAL	5,245'
2	2	AUTOMOBILE PARKING	—
3	3	AIRCRAFT TIEDOWNS	—
4	4	HELICOPTER PARKING PADS	—
5		SLURRY LOADIND PAD	—
6		SLURRY TANKS	—
7		FUEL TANKS	—
	8 15	T- HANGARS	5,235'
16 25		BOX HANGARS	5,240'
26 27		AIR TANKER BASE/ BOX HANGARS	5,240'



MAGNETIC NORTH SOURCE:
NATIONAL GEOGRAPHIC DATA
CENTER, 06,22,05
DECLINATION = 11° 12' E
RATE OF CHANGE 0°6' W min./yr.

100 0 100 200

SCALE IN FEET



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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIROPRT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

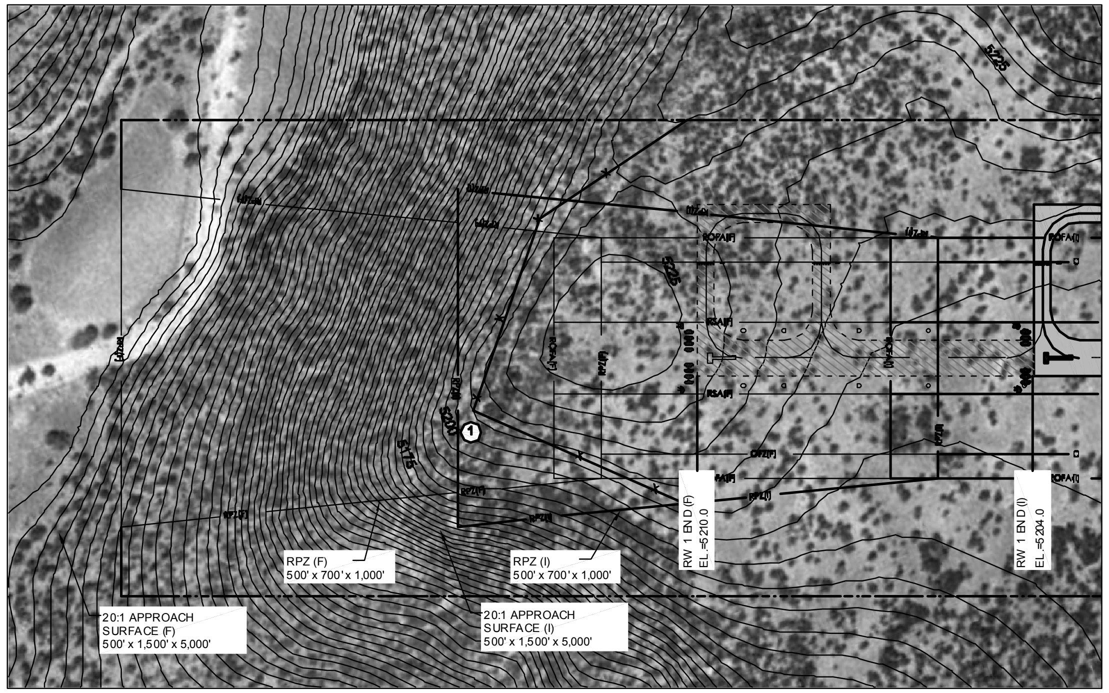
No.	Revision	Date	By
0	INTIAL ALP PREPERATIONS	6/14/06	RF

Project No: 035674
Date: 06,14,06
File Name: 5674503

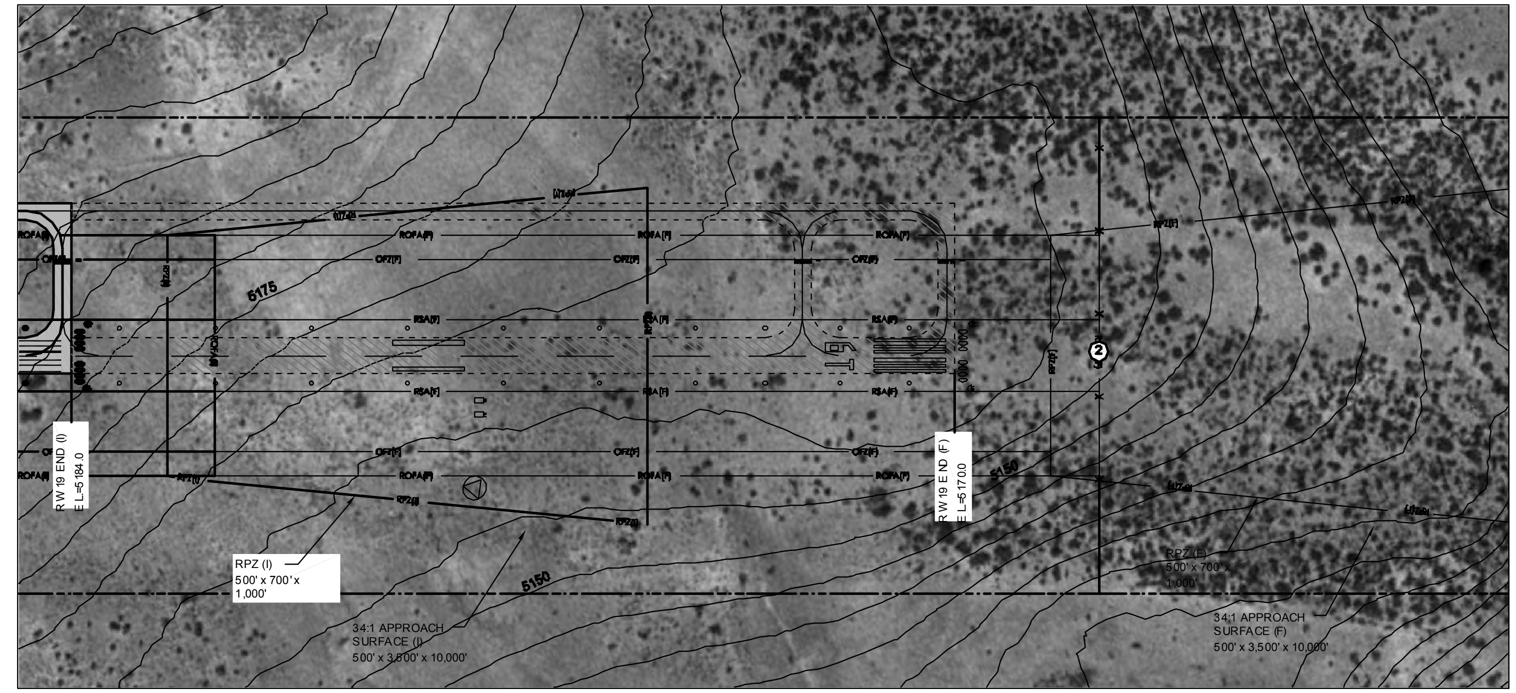
Drawn: RF
Checked: REH
Approved: DAC

TERMINAL AREA DRAWING

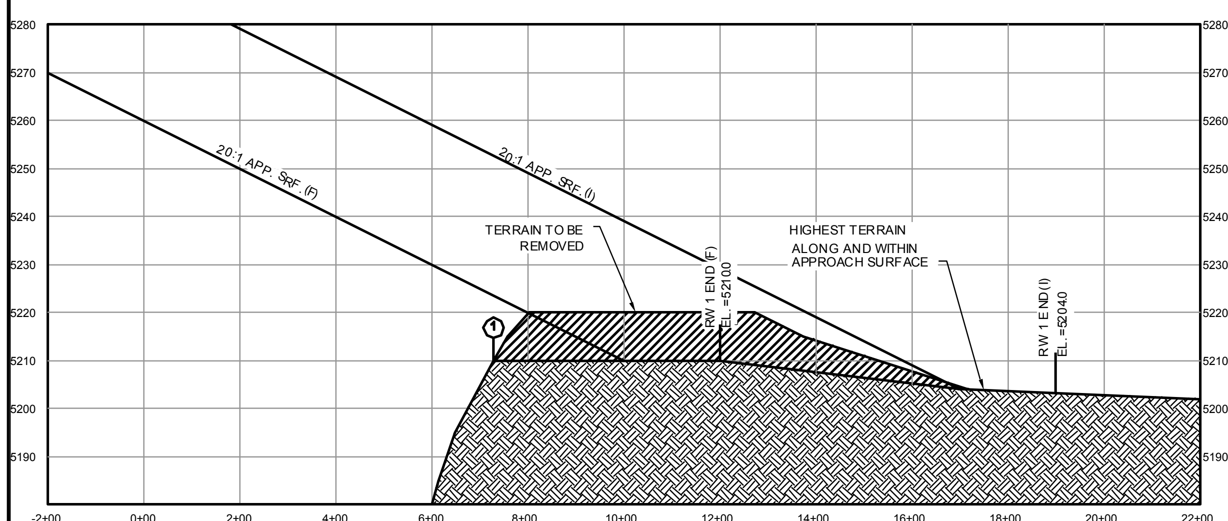
Sheet: 3 of: 9



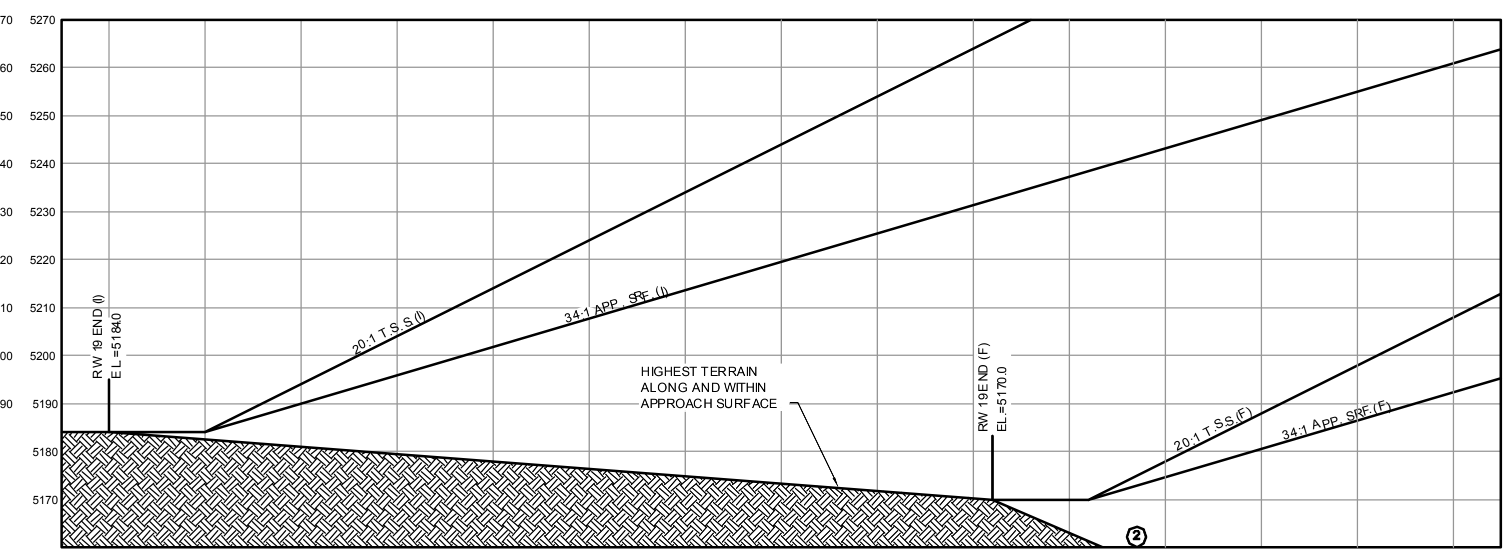
RUNWAY 1 PLAN



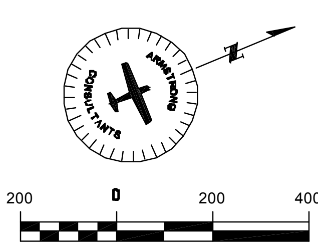
RUNWAY 19 PLAN



RUNWAY 1 PROFILE



RUNWAY 19 PROFILE



OBJECTS WITHIN INNER APPROACH SURFACE					
NO.	OBJECT	TOP ELEVATION	20:1 (E) PENETRATION	34:1 (F) PENETRATION	PROPOSED ACTION
1	FENCE	5185'	-42'	-13'	NONE
2	FENCE	5160'	NA	-13'	NONE

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)(U)	RUNWAY SAFETY AREA (RSA)			AIRPORT REFERENCE POINT (ARP)
OFZ(E)	OFZ(F)(U)	OBSTACLE FREE ZONE (OFZ)			AIRPORT BEACON
ROFA(E)	ROFA(F)(U)	RUNWAY OBJECT FREE AREA (ROFA)			WIND CONE & SEGMENTED CIRCLE
RPZ(E)	RPZ(F)(U)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
RVZ(E)	RVZ(F)(U)	RUNWAY VIZIBILITY ZONE (RVZ)			AWOS
BRL(E)	BRL(F)(U)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/ CULVERT
TSA(E)	TSA(F)(U)	TAXIWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
TOFA(E)	TOFA(F)(U)	TAXIWAY OBJECT FREE AREA (ROFA)			ROADS
x x	xx xx	FENCING			MARKINGS

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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

No.	Revision	Date	By
0	INTIAL ALP PREPERATON	6/14/06	RF

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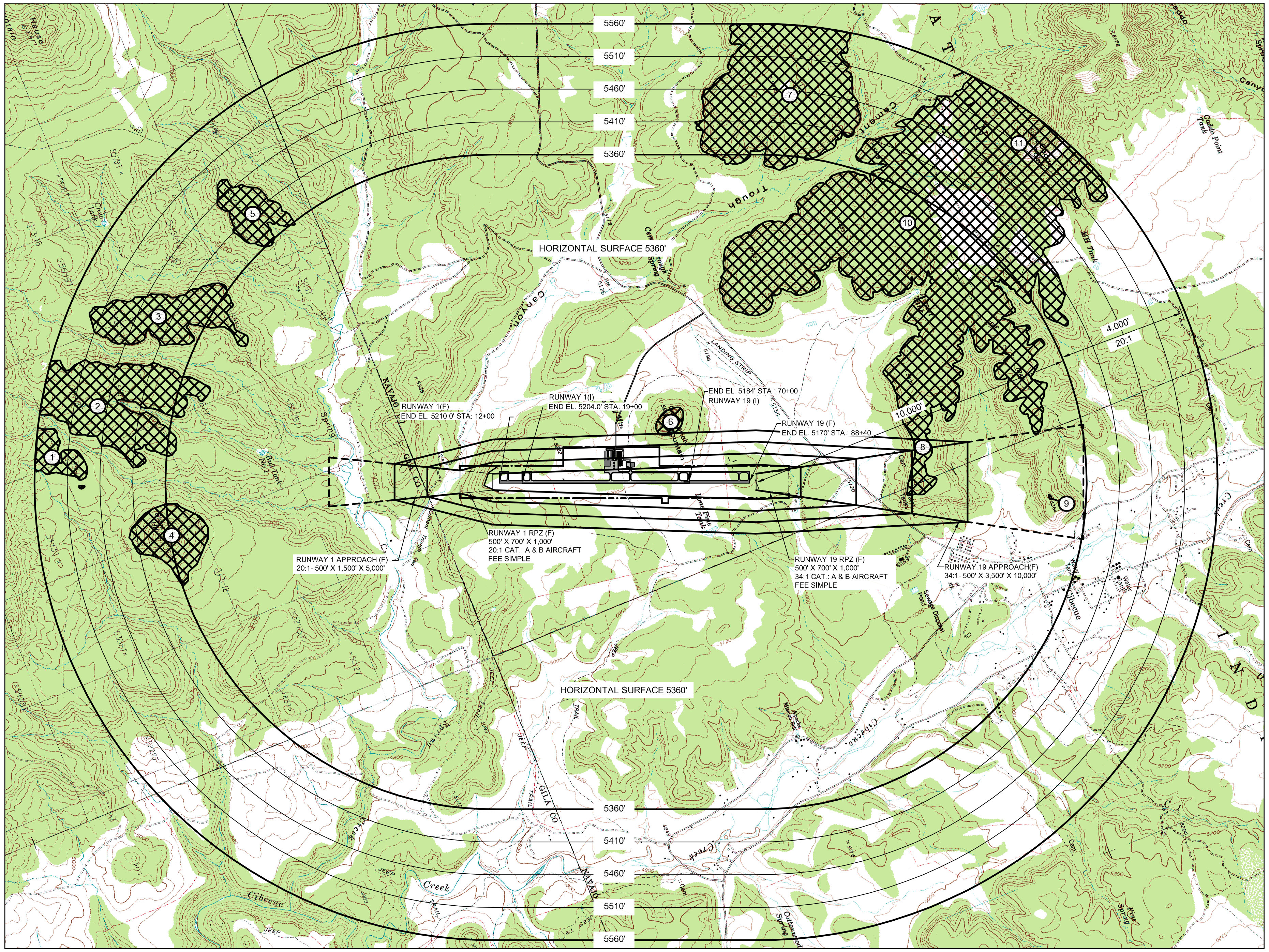
Project No: 035674
Date: 06.14.06
File Name: 5674504

Drawn: RF
Checked: REH
Approved: DAC

RW 1/19 (I)(F)
INNER
APPROACH



LEGEND

Symbol	Description
(crosshatch)	PENETRATIONS
— - - —	AIRPORT PROPERTY BOUNDARY (U)
———	FAR PART 77 AIRSPACE SURFACES

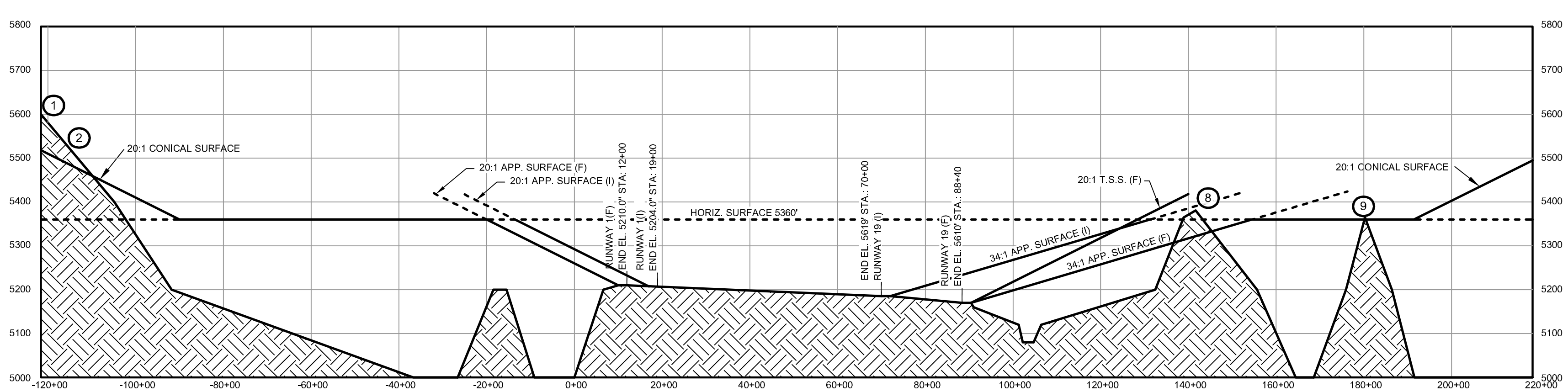
NOTES:
1) Base map taken from U.S.G.S. 7.5 minute qudarangles.

2) Airport elevation is 5210 feet(NAVD 88) above mean sea level.

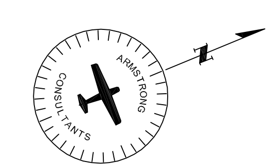
PENETRATIONS

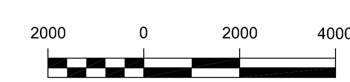
SURFACE		OBJECT	TOP ELEVATION	AMOUNT OF PENETRATION	PROPOSED ACTION
PRIMARY		NONE	---	---	---
TRANSITIONAL	6	TERRAIN	5,510'	150'	OBSTRUCTION LIGHT
APPROACH	8	TERRAIN	5,400'	40'	OBSTRUCTION LIGHT
	9	TERRAIN	5,364'	4'	NONE
HORIZONTAL	4	TERRAIN	5,792'	432'	NONE
CONICAL	1	TERRAIN	5,561'	101'	NONE
	2	TERRAIN	5,608'	48'	NONE
	3	TERRAIN	5,548'	38'	NONE
	5	TERRAIN	5,528'	68'	NONE
	7	TERRAIN	5,615'	155'	NONE
	10	TERRAIN	5,572	212'	NONE
	11	TERRAIN	6,124	614'	NONE

* SEE INNER APPROACH DRAWINGS FOR CLOSE IN OBSTRUCTIONS.



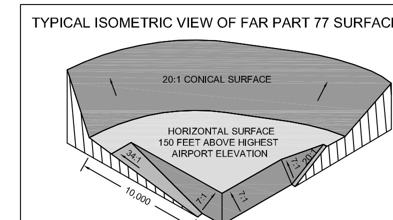
RUNWAY 1/19 (I)(F) PROFILE





SCALE IN FEET

TYPICAL ISOMETRIC VIEW OF FAR PART 77 SURFACES



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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

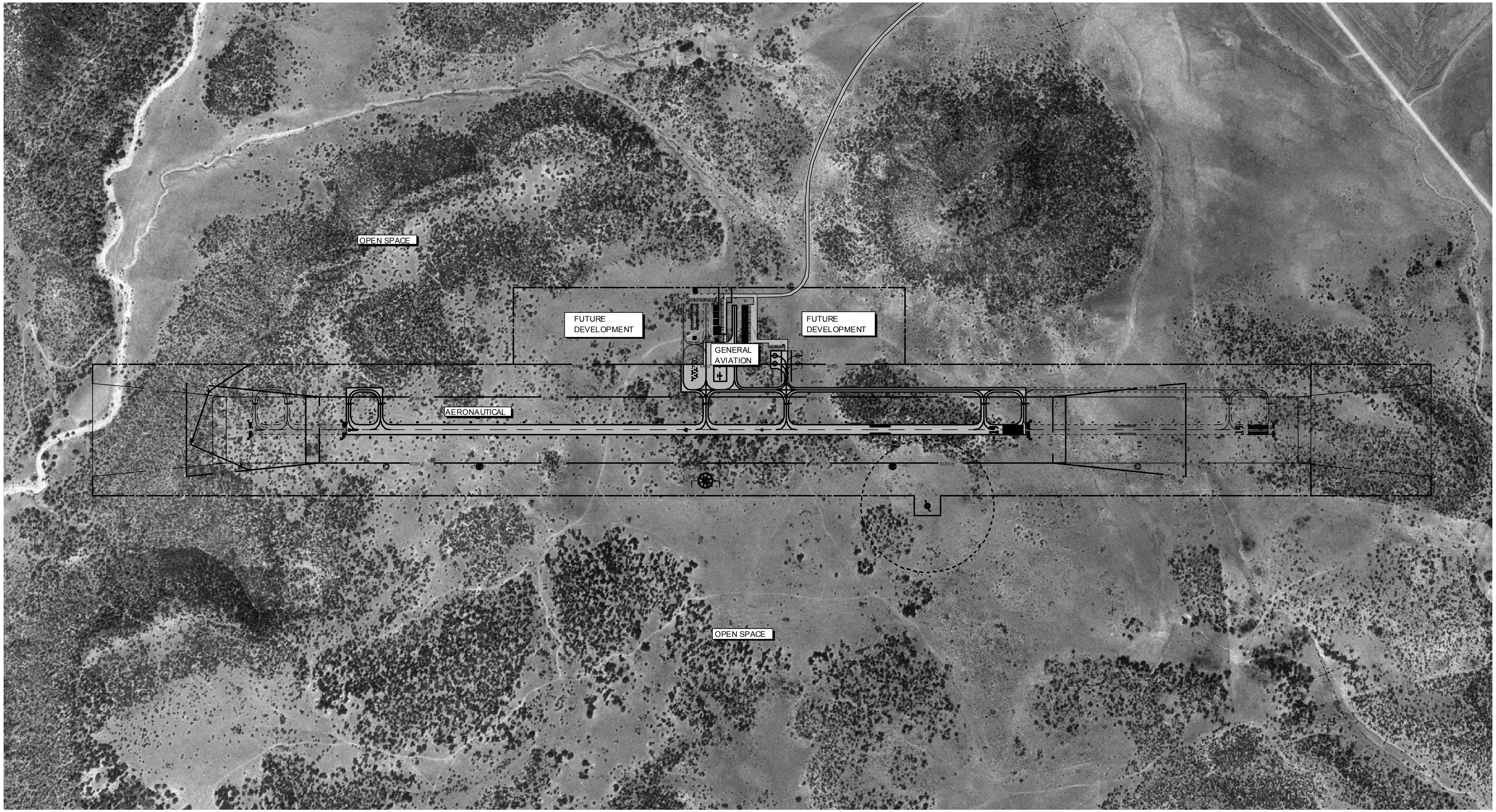
No.	Revision	Date	By
0	INTIAL ALP PREPERATION	6/14/06	RF

Project No: 035674
Date: 06.14.06
File Name: 5674505

Drawn: RF
Checked: REH
Approved: DAC

FAR PART "77" AIRSPACE

Sheet: 5 of: 9



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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

No.	Revision	Date	By
0	INITIAL ALP PREPERATION	6/14/06	RF

Project No: 035674
Date: 06.14.06
File Name: 5674506

Drawn: RF
Checked: REH
Approved: DAC

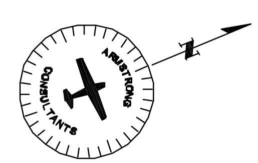
ON AIRPORT LAND USE

Sheet: 6 of: 9

Zoning Ordinances Currently in Effect
Compatible land use and height restriction zoning in the process of being implemented.(see sheets 5 and 7)

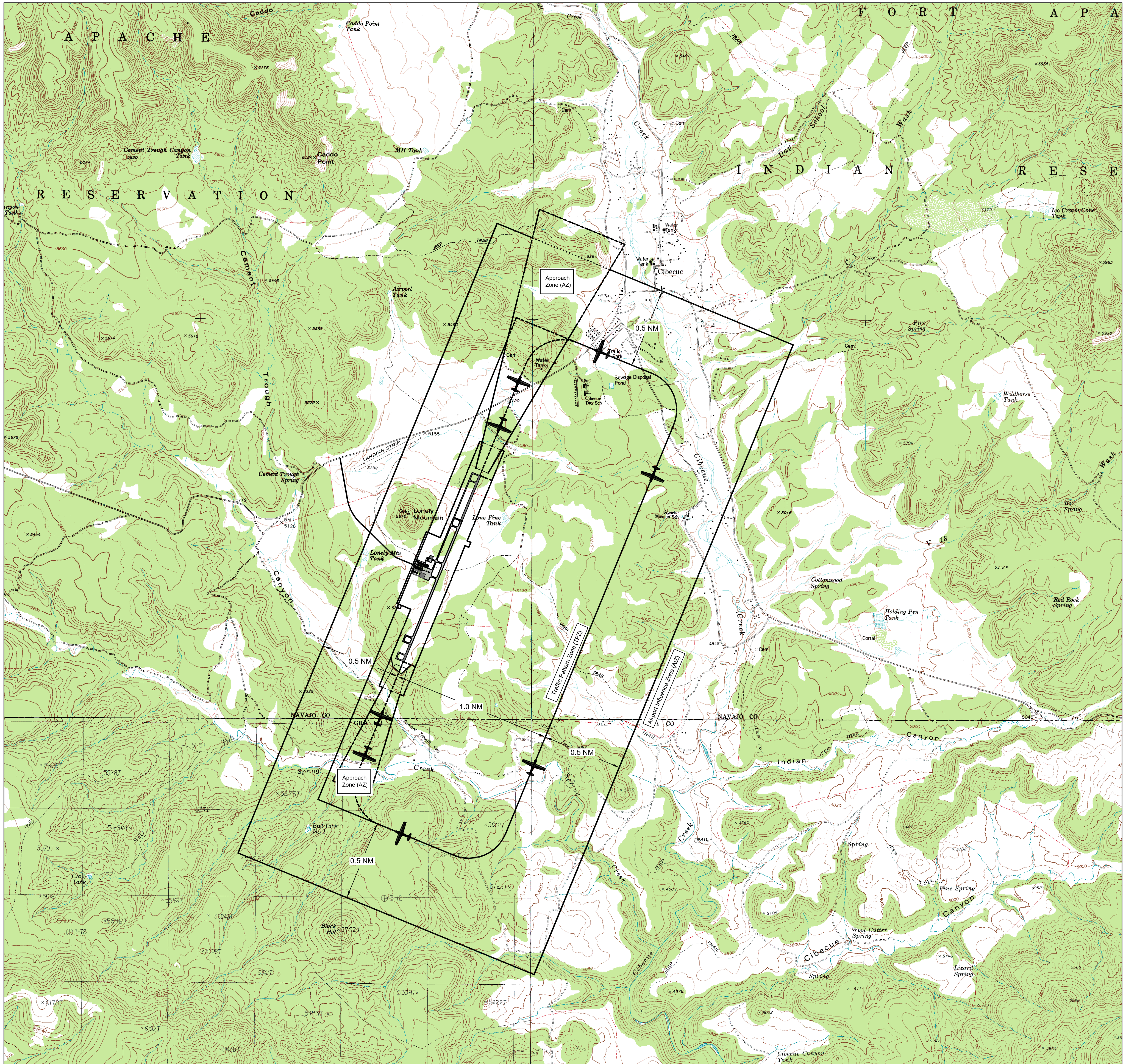
Notice of Proposed Construction
All Proposed non-AIP construction on airport property, regardless of height or depiction on the approved ALP, must be submitted to FAA using Form7460-1, *Notice of Proposed Construction or Alteration*, or Form 7480-1, *Notice of Landing Area Proposal,* as appropriate.

Noise Contour
There is no initial 65 DNL noise contour based on the number of operations anticipated.



400 0 400 800
SCALE IN FEET

LEGEND					
EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE	
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)(U)	RUNWAY SAFETY AREA (RSA)			AIRPORT REFERENCE POINT (ARP)
OFZ(E)	OFZ(F)(U)	OBSTACLE FREE ZONE (OFZ)			AIRPORT BEACON
ROFA(E)	ROFA(F)(U)	RUNWAY OBJECT FREE AREA (ROFA)			WIND CONE & SEGMENTED CIRCLE
RPZ(E)	RPZ(F)(U)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
RVZ(E)	RVZ(F)(U)	RUNWAY VIZIBILITY ZONE (RVZ)			AWOS
BRL(E)	(BRL(F)(U)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/ CULVERT
TSA(E)	TSA(F)(U)	TAXIWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
TOFA(E)	TOFA(F)(U)	TAXIWAY OBJECT FREE AREA (ROFA)			ROADS
x x x	xx xx	FENCING			MARKINGS



LAND USE COMPATIBILITY GUIDELINES

Land Use Category	Airport Influence Zone (AIZ)	Traffic Pattern Zone (TPZ)	Approach Zone (AZ)
Residential			
single-family, nursing homes, mobile homes, multi-family, apartments, condominiums	+	o (3)	- (1,3)
transient lodging, hotel, motel	+	o (3)	- (1,3)
Public			
schools, libraries, hospitals	+	o (3)	- (3)
churches, auditoriums, concert halls	+	o (3)	- (3)
transportation, parking, cemeteries	++	++	++
Commercial and Industrial			
offices, retail trade,	++	+	o (3)
service commercial, wholesale trade, warehousing, light industrial,	++	+	o (3)
general manufacturing, utilities, extractive industry	++	++	o (3)
Agricultural and Recreational			
cropland	++	++	++
livestock breeding	++	++	++
parks, playgrounds, zoos, golf courses, riding stables, water recreation	++	++	++
outdoor spectator sports	++	+	- (3)
amphitheaters	o	- (4)	- -
open space	++	++	++

NOTE: DEVELOPMENT PROJECTS WHICH ARE WILDLIFE ATTRACTANT, INCLUDING SEWERAGE PONDS AND LANDFILLS, WITHIN 10,000 FEET OF THE AIRPORT ARE UNACCEPTABLE. (REF.: FAA AC 150/5200-33)

(1) If allowed, avigation easements and disclosure must be required as a condition of development.
(2) Any structures associated with uses allowed in the RPZ must be located outside the RPZ.
(3) If no reasonable alternative exists, use should be located as far from extended centerline as possible.
(4) If no reasonable alternative exists, use should be located as far from extended runway centerline and traffic patterns as possible.
(5) Transportation facilities in the RPZ (i.e. roads, railroads, waterways) must be configured to comply with Part 77 requirements.

CRITERIA

Land Use Availability	Interpretation/Comments
++ Clearly Acceptable	The activities associated with the specified land use will experience little or no impact due to airport operations. Disclosure of airport proximity should be required as a condition of development.
+ Normally Acceptable	The specified land use is acceptable in this zone or area. Impact may be perceived by some residents. Disclosure of airport proximity should be required as a condition of development. Dedication of avigation easements may also be advisable.
o Marginally Acceptable	An impact will be perceived as a result of allowing the specified use in this zone or area. Disclosure of airport proximity and avigation easements should be required as a condition of development.
- Normally Unacceptable	Specified use should be allowed only if no reasonable alternative exists. Disclosure of airport proximity and avigation easements must be required as a condition of development.
- - Clearly Unacceptable	Specified use must not be allowed. Potential safety or overflight nuisance impacts are likely in this area.

NOTICE OF PROPOSED CONSTRUCTION

An FAA Form 7460-1, Notice of Proposed Construction or Alteration must be submitted for any construction or alteration (including hangars and other on-airport and off-airport structures, towers, etc) over 200 feet in height, or within 20,000 horizontal feet of the airport greater in height than an imaginary surface extending outward and upward from the runway at a slope of 100 to 1.

NOTE: DEVELOPMENT PROJECTS WHICH ARE WILDLIFE ATTRACTANTS, INCLUDING SEWAGE TREATMENT PONDS AND WETLAND MITIGATION BANKS WITHIN 10,000 FEET OF THE RUNWAY OR NEW LANDFILLS WITHIN 6 MILES OF THE AIRPORT ARE UNACCEPTABLE. (REFERENCE FAA ADVISORY CIRCULAR 150/5200-33)

TYPICAL TRAFFIC PATTERN DIRECTION AND FLIGHT TRACK AREA.

N

2000 0 2000 4000

SCALE IN FEET

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CIBECUE AIRPORT
CIBECUE, ARIZONA
AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

No.	Revision	Date	By
0	INITIAL ALP PREPERATION	3/14/06	RF

Project No: 035674
Date: 06.14.06
File Name: 5674507

Drawn: RF
Checked: REH
Approved: DAC

OFF AIRPORT LAND USE

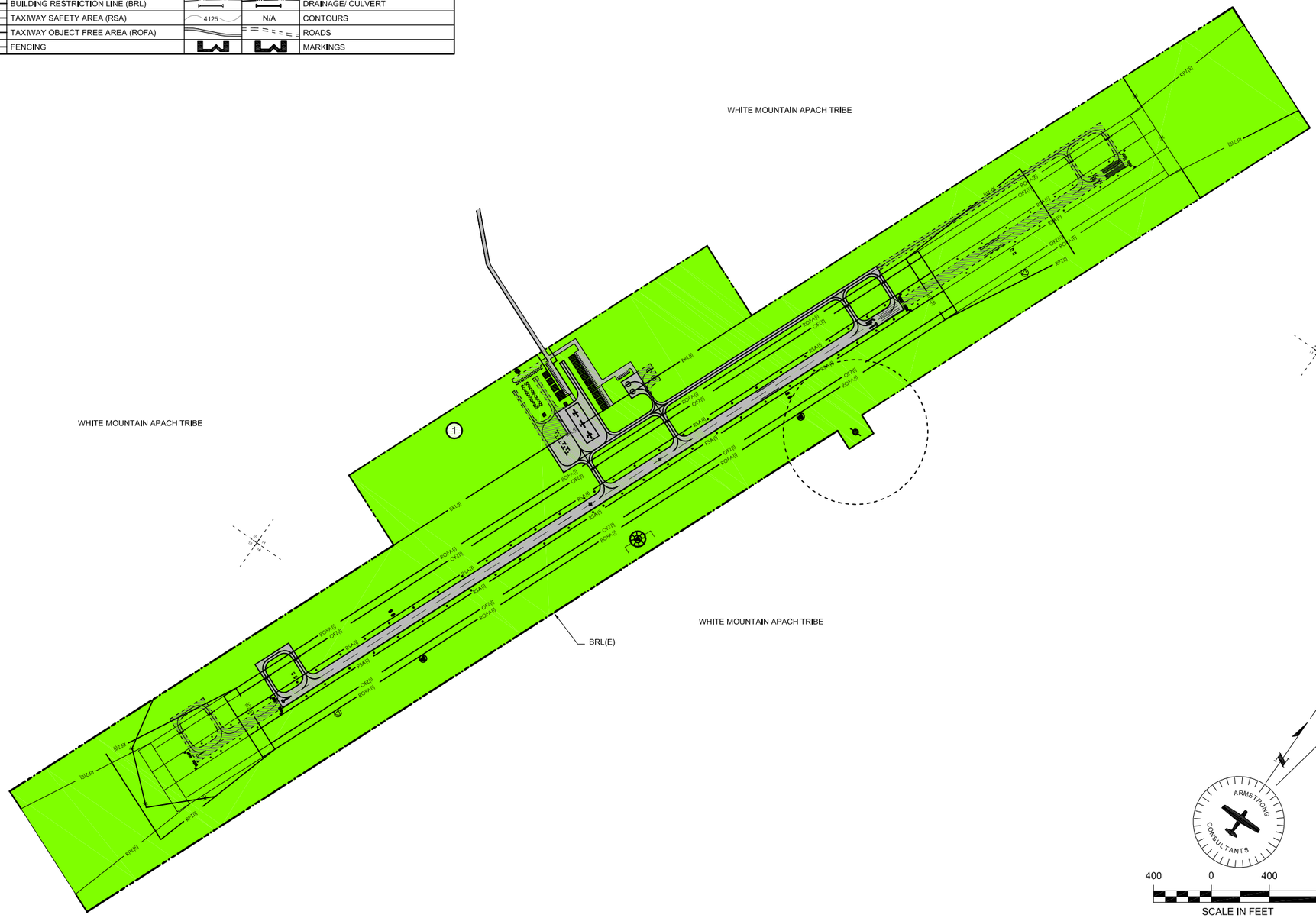
LEGEND

EXISTING	FUTURE/ULTIMATE	DESCRIPTION	EXISTING	FUTURE	
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
RSA(E)	RSA(F)(U)	RUNWAY SAFETY AREA (RSA)			AIRPORT REFERENCE POINT (ARP)
OFZ(E)	OFZ(F)(U)	OBSTACLE FREE ZONE (OFZ)			AIRPORT BEACON
ROFA(E)	ROFA(F)(U)	RUNWAY OBJECT FREE AREA (ROFA)			WIND CONE & SEGMENTED CIRCLE
RPZ(E)	RPZ(F)(U)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
RVZ(E)	RVZ(F)(U)	RUNWAY VIZIBILITY ZONE (RVZ)			AWOS
BRL(E)	(BRL(F)(U)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/ CULVERT
TSA(E)	TSA(F)(U)	TAXIWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
TOFA(E)	TOFA(F)(U)	TAXIWAY OBJECT FREE AREA (ROFA)			ROADS
X	X	FENCING			MARKINGS

LAND TO BE ACQUIRED/ ALLOCATION

PARCEL	OWNER	INTEREST	DATE	Book	Page	ACRES	FEDERAL PART.	PURPOSE
1	WHITE MOUNTAIN APACHE TRIBE	ALLOCATED FOR AIRPORT USE	---	---	---	267.41 ac.	NONE	APPPROACH PROTECTION

NOTE: ALL LAND IS OWNED BY THE WHITE MOUNTAIN APACHE TRIBE. PROPERTY LINE IDENTIFIES LAND DESIGNATED FOR AIRPORT USE.



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AIRPORT SPONSOR:
WHITE MOUNTAIN APACHE TRIBE
AIRPORT LAYOUT PLANS

No.	Revision	Date	By
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Project No: 035674
Date: 06.14.06
File Name: 5674508

Drawn: RF
Checked: REH
Approved: DAC

EXHIBIT "A"
PROPERTY
MAP

Sheet: 8 of: 9

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CIBECUE AIRPORT
CIBECUE, ARIZONA

AIRPORT LAYOUT PLANS

No.	Revision	Date	By
0	INTIAL ALP PREPERATION	6/14/06	RF

Project No: 035674
Date: 06.14.06
File Name: 5674509

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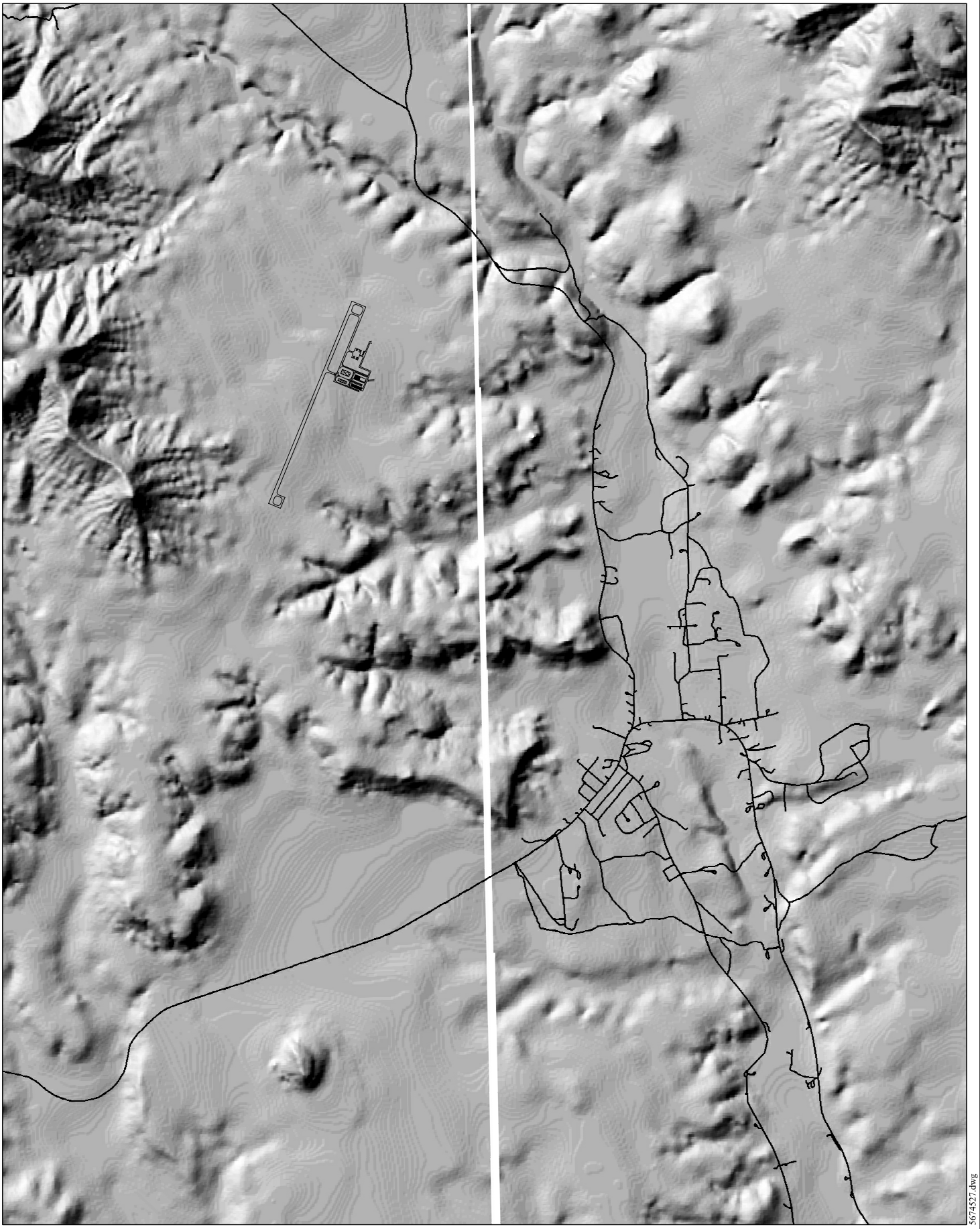
Checked: REH
Approved: DAC

AERIAL PHOTO

Sheet: 9 **of:** 9

Appendix A
Preliminary Site Drawings

Cibecue
Airport Master Plan

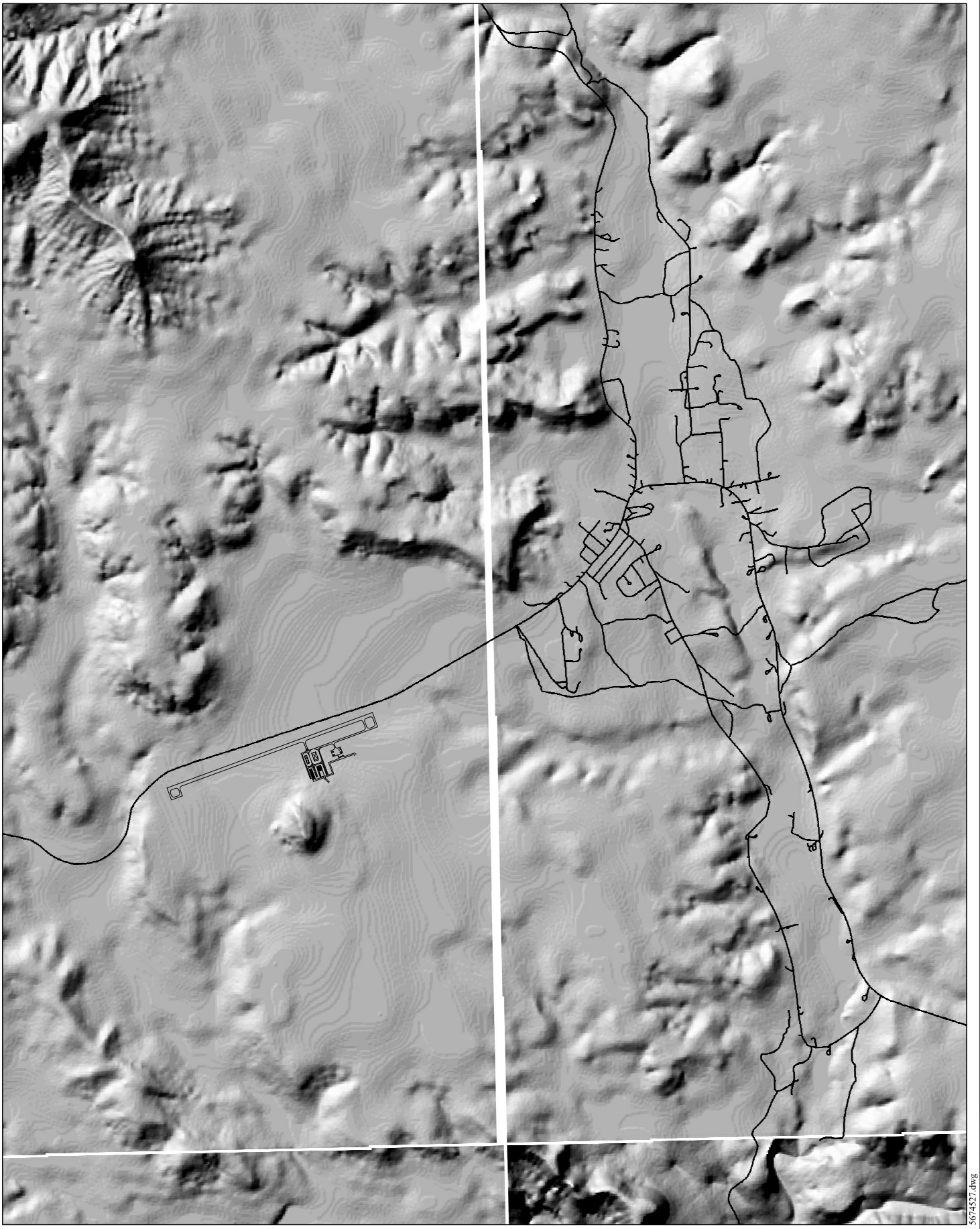


CIBECUE AIRPORT

SITE SELECTION STUDY
CADDO POINT SITE 1

1500 0 1500 3000
SCALE IN FEET

5674527.dwg



CIBECUE AIRPORT

SITE SELECTION STUDY
LANDING STRIP SITE 2A

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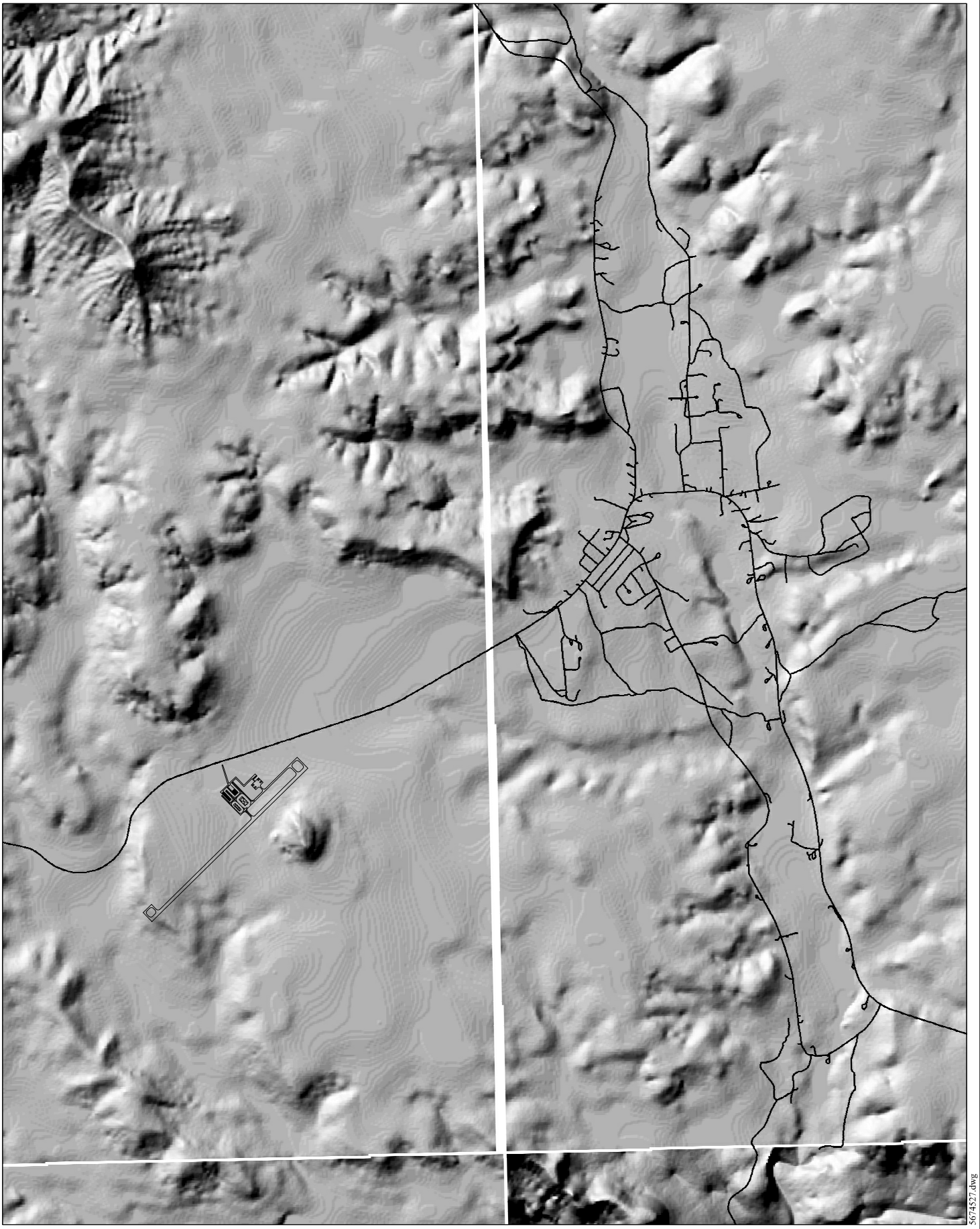
SCALE IN FEET

5674527.dwg



CIBECUE AIRPORT

SITE SELECTION STUDY
LANDING STRIP SITE 2B

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SCALE IN FEET

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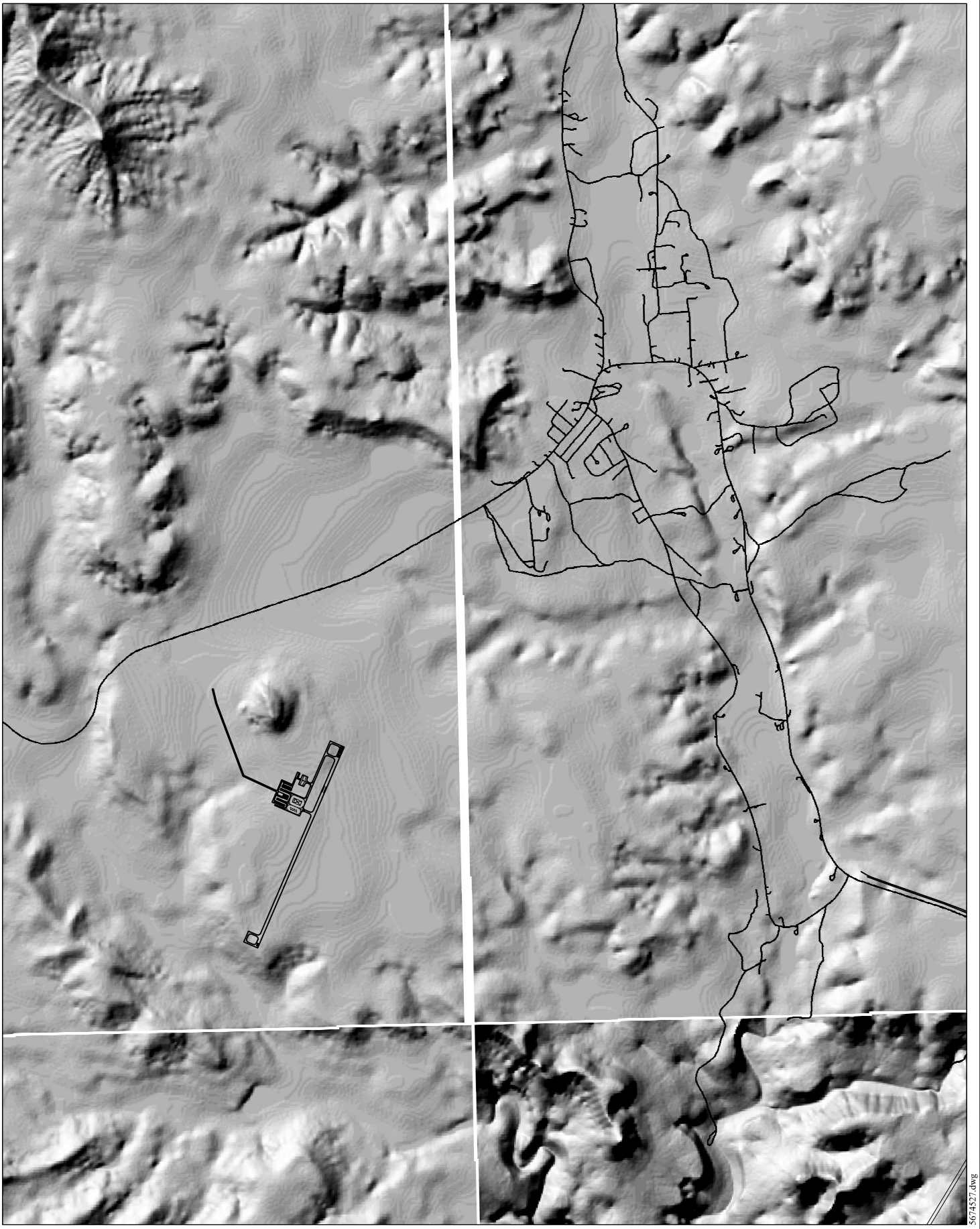
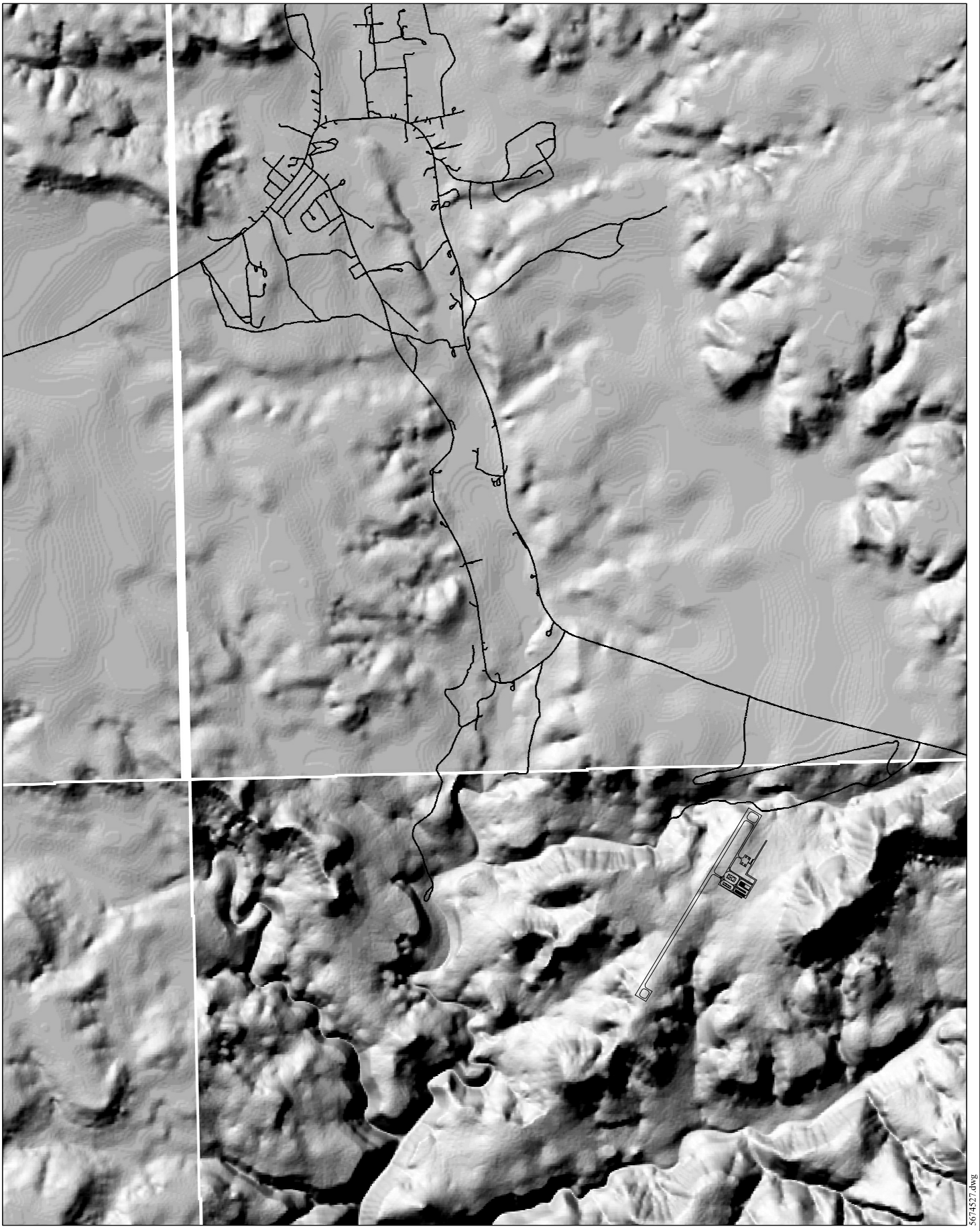


CIBECUE AIRPORT

SITE SELECTION STUDY
LONE PINE SITE 3

1500 0 1500 3000
SCALE IN FEET

5674527.dwg



CIBECUE AIRPORT

SITE SELECTION STUDY
CIBECUE CANYON SITE 4

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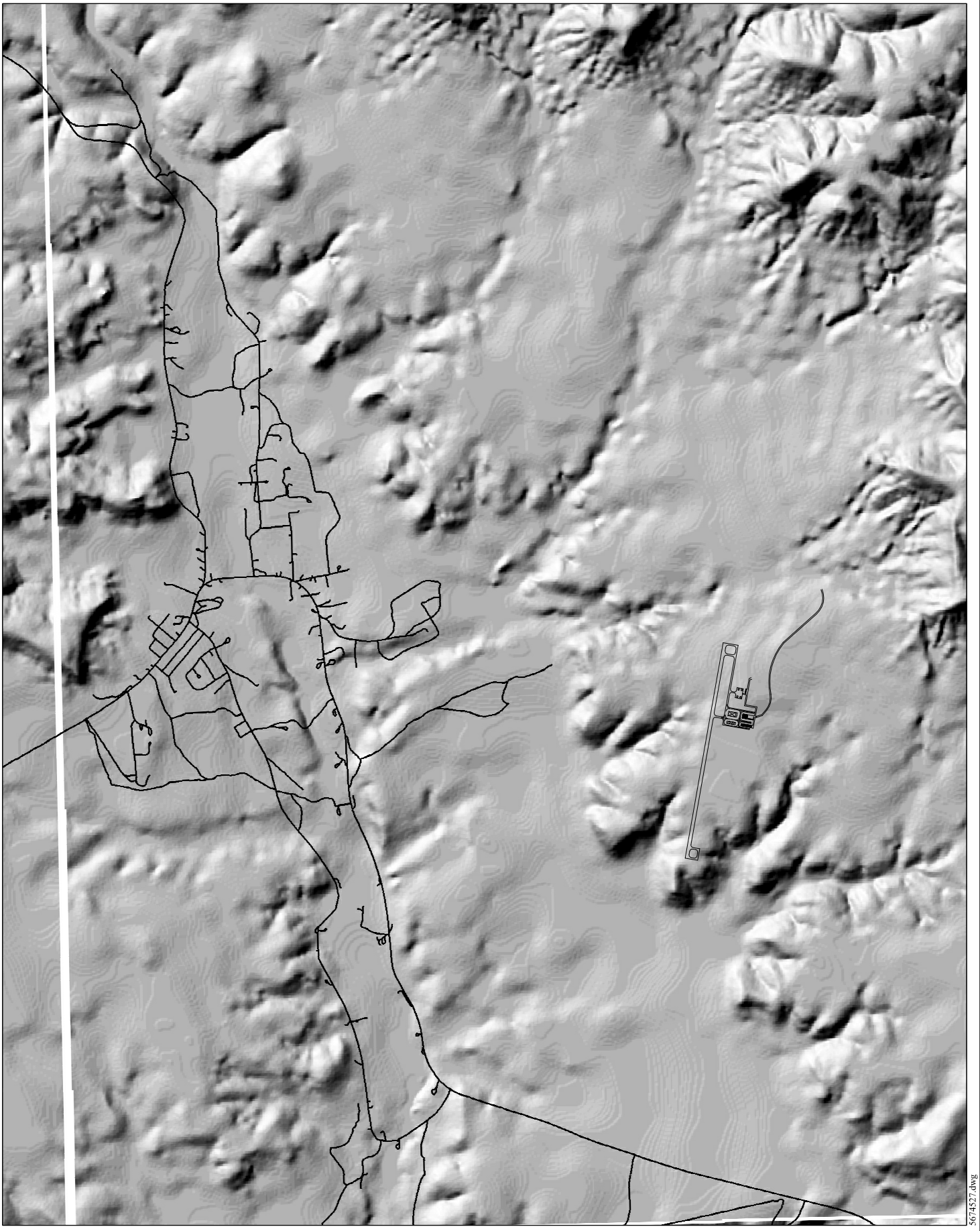
SCALE IN FEET

5674527.dwg



CIBECUE AIRPORT

SITE SELECTION STUDY
CIBECUE CANYON SITE 5

1500 0 1500 3000
SCALE IN FEET

5674527.dwg

Appendix B
Public Involvement

Cibecue
Airport Master Plan

Tribal Transportation Committee

May 27, 2004
Executive Conference Room
Cibecue Airport Preliminary Site Selection Meeting
10:00 a.m. – 5:00 p.m.

Sign – In Sheet

	Name	Organization	Phone Number
1.	Ryan Hayes	Armstrong Consultants	970-242-0101
2.	Dennis Corsi	Armstrong Consultants	970-242-0101
3.	Keith Kowen	" "	" "
4.	Raymus Albert	Tribal Land Office	928 3385266
5.	John Bereman	WMAT Engineer	928-338-4346 x 25;
6.	Alfred R. Brooks	Trans. Board	338-1504 521-3647
7.	Denise Taylor	WMAT Land Use Planner	338-4346 x. 370
8.	Colbert Burnette	WMAT. Transportation	338-4346 X357
9.	Gregg Henry	Transportation Board	928 242-0029
10.	David Raney	BIA AFMO	928-338-5448
11.	George Leech		
12.	A Pailzote	WMAT	928 3384545
13.	Lorin D. Hewey	Transportation Planning / CBR Comm. Rep.	306-4081
14.	Jacob Henry	Tribal Council Dist I	(928) 332-2488
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			

Tribal Transportation Committee

May 27, 2004
Executive Conference Room
Cibecue Airport Preliminary ~~Site Selection Meeting~~ SITE VISIT ROSTER
10:00 a.m. – 5:00 p.m.

✓ = Attended Meeting and SITE VISIT

Sign – In Sheet

#'s 15-18 = Attended only SITE VISIT

	Name	Organization	Phone Number
✓1.	Ryan Hayes	Armstrong Consultants	970-242-0101
✓2.	Dennis Corsi	Armstrong Consultants	970-242-0101
3.	Keith Kolen	" "	" "
✓4.	Raymus Albert	Tribal Land Office	928 338 5266
✓5.	John Bereman	WMAT Engineer	928-338-4346 x 2[illegible]
✓6.	Alfred R. Brooks	TRANS. BOARD	338-1504 521-3647
7.	Denise Taylor	WMAT Land Use Planner	338-4346 x.370
✓8.	Colbert Burnette	WMAT. Transportation	338-4346 X357
✓9.	Gregg Henry	Transportation Board	928 242-0029
✓10.	David Raney	BIA AFMO	928-338-5448
11.	George Leech		
12.	[illegible]	WMAT	928 338 4545
✓13.	Lorin D. Henry	Transportation Planning / CBQ Comm. Prez	306-4081
✓14.	Jacob Henry	Tribal Council Dist I	(928) 332-2488
15.	Layne Endfield	Cibecue Livestock VP	
16.	Clifford DeHosa[illegible]	Cibecue (also on Livestock association)	
17.	Orin Cromwell	WMAT ENG. Surveyor	(928) 338-4346 ext. 314
18.	Hershel [illegible] Sr	WMAT (watershed)	
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			

Attention:

Community Meeting Tonight

Tuesday, June 15, 2004 @ 6:30 PM

At the New Community Building

- Airport @ Lonely Mountain
- Update on Meetings, 6/10/04

Everyone Welcome!

Attendance Roster

Public Information Meeting

Cibecue Airport Site Selection Study

June 15, 2004 6:00 P.M.

NAME	ADDRESS	PHONE	FAX
Dennis Corsi Armstrong Con.	861 Rood Ave. Grand Jct. CO 81501	970 242-0101	970-241-1769
Ryan Hayes Armstrong Con.	"	"	"
John Bereman WMAT Eng	POB 700 Whiteriver AZ 85941	928-338-4346 x 257	928-338-5195
Colbert G. Burnette WMAT Transportation	P.O. Box 700 Whiteriver, AZ 85941	928 338 4346 X357	928 338-5195
Jonah Beach Sr. Comm. Officer	Box 81245 Cibecue AZ 85911	332-2355	—0—
Matthew Tortice	P.O Box 80241 Cibecue, AZ 85911		—0—
Manuelita Early			
Comm. Pres. Lorin D. Henry	P.O. Box 80327 Cibecue, AZ. 85911	C-Ph. 306-4081 ofs-(928)332-2365 mess 332-2488	-0-
[illegible]	Box 81221 CBQ AZ 85911	928 332-2431 wk	
Gregg Henry WMA Guides CBQ Vice-President	Box 80145 Cibecue Az 85911	c 928-242-0029 w 928-332 2365	928-332-2326
Jennifer Hoffman	Box 80265 Cibecue AZ 85911	(928) 332-2730	
Geneva Gregg Johnson	P.O Box 80072 Cibecue, AZ. 85911	(928) 306-1368	
John Mason	P.O Box 81223 Cibecue, AZ 85911	306-1371	

Manuelita Early Cibecue AZ 85911 — Box [illegible]

Cibecue Community Sites Meeting Presentation

1) Purpose of Meeting (Cover Board) (Part 77 Board)

2) Feasibility Study

3) Preliminary Site Analysis (Preliminary site drawing)

    a. Purpose of Site Selection, find a site that would meet FAA design standards.

    b. Six sites were analyzed in this preliminary analysis and two sites were recommended for further consideration at this point. Potential sites were screened for factors such as location, soil type, terrain, runway alignment, site layout, airspace and other factors including cultural/heritage resource impacts. Sites 2B and 3 were chosen for refined site analysis.

4) Refined Site Analysis

    a. More detailed analysis of airspace, costs, layout for Sites 2B and 3.

    b. Lone Pine Site (Site 3) is the preferred site (Site 3 layout drawing)

        1. Airspace, approach surfaces clear (Site 3 airspace drawing)

        2. Runway Alignment, Runway is aligned with prevailing wind and will provide close to 100% wind coverage.

        3. Earthwork and Costs, relatively flat terrain, less than 1% gradient across site

        4. Site Access, there is already an access road to the site that could be improved for a minimal cost

        5. Site Layout, there is adequate land available for initial and future airport facilities.

        6. Potential cultural resource impacts.

Thank you for attending this consultation meeting! We sincerely hope you find the meeting informative and useful; and we appreciate your assistance in improving the safety and utility of the Cibecue Airport.

At this point we would like to open the meeting for any questions?

Cibecue Community Sites Meeting Q and A

1) Did you talk with Cattle Association?

   Yes, Cibecue Cattle Association Representatives attended Site Visit and concurred with Site 3, as long as the existing site could be transferred as a replacement use.

2) Support expressed for site 3, reasons: safe, convenient, serve growing population with air medivac and fire protection.

3) Question about water

   Only water required would be for personal use. Portable tanked, stored on site would likely be considered. Fire management contractors will provide their own water.

4) What other concerns have been previously expressed?

   Cultural Resources - Survey will be included in EA, sites will be avoided.

   Access

   Farming - Acorn Gathering area plotted with GPS and shown on alternative drawings.

   Cattle Association - Concurred with Site 3 at site visit

   Private land designations - not a factor, all land used only for cattle grazing

   Disposition of existing site - West 1/3 gravel pit for access road material at new site, East 2/3 remediate and return to cattle association.

Q and A followed by presentation in Apache by Lorin Henry, Cibecue Community President

Appendix C
Model Zoning Ordinance and Avigation Easement

Cibecue
Airport Master Plan

White Mountain Apache Reservation

Cibecue Airport

AIRPORT OVERLAY ZONING ORDINANCE

An ordinance regulating and restricting the height of structures and objects of natural growth, and otherwise regulating the use of property, in the vicinity of the Cibecue Airport by creating the appropriate zones and establishing the boundaries thereof; providing for changes in the restrictions and boundaries of such zones; defining certain terms used herein, referring to the Cibecue Airport FAR Part 77 Airspace Drawing and Off Airport Land Use Drawing which are incorporated in and made a part of this ordinance; providing for enforcement; establishing a board of adjustment; and imposing penalties.

It is hereby found that an obstruction has the potential for endangering the lives and property of users of the Cibecue Airport and property or occupants of land in its vicinity; that an obstruction may affect existing and future instrument approach minimums at the Cibecue Airport; and that an obstruction may reduce the size of areas available for the landing, takeoff, and maneuvering of aircraft, thus tending to destroy or impair the utility of the Cibecue Airport and the public investment therein. Accordingly, it is declared:

1. That the creation or establishment of an obstruction has the potential of being a public nuisance and may injure the region served by the Cibecue Airport.

2. That the encroachment of noise sensitive or otherwise incompatible land uses within certain areas as set forth herein below may endanger the health, safety, and welfare of the owners, occupants, or users of the land; and

3. That it is necessary in the interest of the public health, public safety, and general welfare that the creation or establishment of obstructions that are a hazard to air navigation be prevented; and

4. That the prevention of these obstructions should be accomplished, to the extent legally possible, by the exercise of the police power without compensation; and

5. That the Cibecue Airport fulfills an essential community purpose.

It is further declared that the prevention of the creation of establishment of hazards to air navigation, the elimination, removal, alteration or mitigation of hazards to air navigation, or the marking and lighting of construction are public purposes for which a political subdivision may raise and expend public funds and acquire land or interests in land.

It is hereby ordained by the White Mountain Apache Tribe as follows:

SECTION I

SHORT TITLE

This Ordinance shall be known and may be cited as the Cibecue Airport Overlay Zoning Ordinance.

SECTION II

DEFINITIONS

As used in this Ordinance, unless the context otherwise requires:

1. AIRPORT - Cibecue Airport.

2. AIRPORT ELEVATION - The highest point of an airport's usable landing area measured in feet from mean sea level.

3. APPROACH SURFACE - A surface longitudinally centered on the extended runway centerline, extending outward and upward from the end of the primary surface and at the same slope as the approach zone height limitation slope set forth in Section IV of this Ordinance. In plan the perimeter of the approach surface coincides with the perimeter of the approach zone.

4. APPROACH, TRANSITIONAL, HORIZONTAL, AND CONICAL ZONES - These zones are set forth in Section III of this Ordinance.

5. BOARD OF ADJUSTMENT - A Board consisting of _____#_____ members appointed by the White Mountain Apache Tribe.

6. CONICAL SURFACE - A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

7. HAZARD TO AIR NAVIGATION - An obstruction determined to have a substantial adverse effect on the safe and efficient utilization of the navigable airspace.

8. HEIGHT - For the purpose of determining the height limits in all zones set forth in this Ordinance and shown on the zoning map, the datum shall be mean sea level elevation unless otherwise specified.

9. HELIPORT PRIMARY SURFACE - The primary surface coincides in size and shape with the designated takeoff and landing area of a heliport. This surface is a horizontal plane at the elevation of the established heliport elevation.

10. HORIZONTAL SURFACE - A horizontal plane 150 feet above the established airport elevation, the perimeter of which in plan coincides with the perimeter of the horizontal zone.

11. LARGER THAN UTILITY RUNWAY - A runway that is constructed for and intended to be used by propeller driven aircraft of greater than 12,500 pounds maximum gross weight and jet powered aircraft.

12. NAVD 88 - North American Vertical Datum 1988. All elevations in this ordinance are referenced to the 1988 North American Vertical Datum.

13. NONCONFORMING USE - Any pre-existing structure, object of natural growth, or use of and which is inconsistent with the provisions of this Ordinance or an amendment thereto.

14. NONPRECISION INSTRUMENT RUNWAY - A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in nonprecision instrument approach procedure has been approved or planned. It also means a runway for which a nonprecision approach system is planned and is so indicated on an approved Airport Layout Plan or any other planning document.

15. OBSTRUCTION - Any structure, growth, or other object, including a mobile object, which exceeds a limiting height set forth in Section IV of this Ordinance.

16. PERSON - An individual, firm, partnership, corporation, company, association, joint stock association, or governmental entity; includes a trustee, a receiver, an assignee, or a similar representative of any of them.

17. PRECISION INSTRUMENT RUNWAY - A runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), a Precision Approach Radar (PAR) or a Global Positioning System (GPS). It also means a runway for which a precision approach system is planned and is so indicated on an approved airport layout plan or any other planning document.

18. PRIMARY SURFACE - A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; for military runways or when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The width of the primary surface is set forth in Section III of this Ordinance. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

19. RUNWAY - A defined area on an airport prepared for landing and takeoff of aircraft along its length.

20. STRUCTURE - An object, including mobile object, constructed or installed by man, including but without limitation, buildings, towers, cranes, smokestacks, earth formation, and overhead transmission lines.

21. TRANSITIONAL SURFACES - These surfaces extend outward at 90 degree angles to the runway centerline and the runway centerline extended at a slope of seven (7) feet horizontally for each foot vertically from the sides of the primary and approach surfaces to where they intersect the horizontal and conical surfaces. Transitional surfaces for those portions of the precision approach surfaces, which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at 90 degree angles to the extended runway centerline.

22. TREE - Any object of natural growth.

23. UTILITY RUNWAY - A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

24. VISUAL RUNWAY - A runway intended solely for the operation of aircraft using visual approach procedures.

SECTION III

AIRPORT HEIGHT RESTRICTION ZONES

In order to carry out the provisions of this ordinance, there are hereby created and established certain zones which include all of the land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to the Cibecue Airport. Such zones are shown on the Cibecue Airport Federal Aviation Regulation (FAR) Part 77 Airspace Drawing. Three (3) original, official, and identical copies of the FAR Part 77 Airspace Drawing reflecting the boundaries of the airport height restriction overlay zoning districts of the White Mountain Apache Tribe, Arizona are hereby adopted, and the Tribal Chairman and the White Mountain Apache Tribe Clerk are hereby authorized to sign and attest each map as the official Cibecue Airport FAR Part 77 Airspace Drawing of the White Mountain Apache Tribe, Arizona, and such maps shall be filed and maintained as follows:

1. One (1) copy shall be filed for permanent record in the office of the White Mountain Apache Tribe Clerk and shall be designated as Exhibit 1. This copy shall not be changed in any manner.

2. One (1) copy shall be filed in the office of the Director of Planning and shall be designated as Exhibit 2. This copy shall be maintained by the Planning Department by posting thereon all subsequent changes and amendments.

3. One (1) copy shall be filed in the office of the Airport Manager and shall be designated as Exhibit 3. This copy shall be maintained by the Planning Department by posting thereon all subsequent changes and amendments.

Each portion of an area located in more than one (1) of the following zones shall be evaluated independently according to the zone in which it is located. The various zones are hereby established and defined as follows:

1. PRECISION INSTRUMENT RUNWAY APPROACH ZONE (LARGER THAN UTILITY RUNWAY) – The inner edge of this approach zone coincides with the width of the primary surface and is 1,000 feet wide. The approach zone expands outward uniformly to a width of 16,000 feet at a horizontal distance of 50,000 feet. Its centerline is the continuation of the centerline of the runway.

2. NONPRECISION INSTRUMENT RUNWAY APPROACH ZONE (LARGER THAN UTILITY RUNWAY) - The inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach zone expands outward uniformly to a width of 3,500 feet at a horizontal distance 10,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

3. NONPRECISION INSTRUMENT RUNWAY APPROACH ZONE (UTILITY AIRCRAFT) – The inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach zone expands outward uniformly to a width of 2,000 feet at a horizontal distance 5,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

4. VISUAL RUNWAY APPROACH ZONE (LARGER THAN UTILITY RUNWAY) – The inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach surface expands uniformly to a width of 1,500 feet at

a horizontal distance 5,000 feet from the primary surface. Its centerline is the continuation of the centerline of the runway.

5. VISUAL RUNWAY APPROACH ZONE (UTILITY AIRCRAFT) - The inner edge of this approach zone coincides with the width of the primary surface and is 250 feet wide. The approach surface expands uniformly to a width of 1,250 feet at a horizontal distance of 5,000 feet from the primary surface. The centerline of the approach zone is a continuation of the centerline of the runway.

6. TRANSITIONAL ZONE - The transitional zones are the areas beneath the transitional surfaces.

7. HORIZONTAL ZONE - The horizontal zone is established by swinging arcs of 5,000 or 10,000 feet radii from the center of each end of the primary surface of the primary runway and connecting the adjacent arcs by drawing lines tangent to those arcs. The horizontal zone does not include the approach and transitional zones. The horizontal zone was constructed with 10,000 feet radii.

8. CONICAL ZONE - The conical zone is established as the area that commences at the periphery of the horizontal zone and extends outward therefrom a horizontal distance of 4,000 feet.

SECTION IV

AIRPORT ZONE HEIGHT LIMITATIONS

Except as otherwise provided in this ordinance, no structure shall be erected, altered, or maintained, and no tree shall be allowed to grow in any zone created by this ordinance to a height in excess of the applicable height limit herein established for such zone. Such applicable height limitations are hereby established for each of the zones in question as follows:

1. PRECISION INSTRUMENT RUNWAY APPROACH ZONE – Slopes fifty (50) feet outward for each foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 10,000 feet along the extended runway centerline. Then slopes forty (40) feet outward for each foot upward beginning at the end of and at the same elevation as the first 10,000 feet and extending to a horizontal distance of 40,000 feet along the extended runway centerline.

2. NONPRECISION INSTRUMENT RUNWAY APPROACH ZONE (LARGER THAN UTILITY RUNWAY) - Slopes thirty-four (34) feet outward for each foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 10,000 feet along the extended runway centerline.

3. NONPRECISION INSTRUMENT RUNWAY APPROACH ZONE (UTILITY AIRCRAFT) – Slopes twenty (20) feet outward for each foot upward beginning at the end of and at the same elevation as the primary surface and extending to a horizontal distance of 5,000 feet along the extended runway centerline.

4. VISUAL RUNWAY APPROACH ZONE - Slopes twenty (20) feet outward for each foot upward beginning at the end of and at the same elevation as the primary

surface and extending to a horizontal distance of 5,000 feet along the extended runway centerline.

5. TRANSITIONAL ZONE - Slopes seven (7) feet outward for each foot upward beginning at the sides of and at the same elevation as the primary surface and the approach surface, and extending to a height of 150 feet above the airport elevation. In addition to the foregoing, there are established height limits sloping seven (7) feet outward for each foot upward beginning at the sides of and at the same elevation as the approach surface, and extending to where they intersect the conical surface. Where the precision instrument runway approach zone projects beyond the conical zone, there are established height limits sloping seven (7) feet outward for each foot upward beginning at the sides of and at the same elevation as the approach surface, and extending a horizontal distance of 5,000 feet measured at 90 degree angles to the extended runway centerline.

6. HORIZONTAL ZONE - Established at 150 feet above the airport elevation.

7. CONICAL ZONE - Slopes twenty (20) feet outward for each foot upward beginning at the periphery of the horizontal zone and at 150 feet above the airport elevation and extending to a height of 350 feet above the airport elevation.

SECTION V

COMPATIBLE LAND USE REGULATIONS

1. AIRPORT COMPATIBLE LAND USE OVERLAY ZONING DISTRICTS - For the purpose of regulating the development of noise sensitive land uses to promote compatibility between the Airport and the surrounding land uses, to protect the Airport from incompatible development and to promote the health, safety, and general welfare of property users, the controlled area of Cibecue Airport is divided into Airport Compatible Land Use Overlay Zoning districts. The Airport Compatible Land Use Overlay Zoning districts established herein shall be known as:

Abbreviated Designation	Zoning District Name
AZ	Approach Zone
TPZ	Traffic Pattern Zone
IZ	Airport Influence Zone

2. OFF AIRPORT LAND USE DRAWING

   A. The boundaries of the Airport Compatible Land Use Overlay Zoning Districts set out herein are delineated upon the Cibecue Airport Off Airport Land Use Drawing of the White Mountain Apache Tribe, Arizona, said Off Airport Land Use Drawing being adopted by reference and made a part of this chapter as fully as if the same were set forth herein in detail.

   B. Three (3) original, official, and identical copies of the Off Airport Land Use Drawing reflecting the boundaries of the Airport Compatible Land Use Overlay Zoning districts of the White Mountain Apache Tribe, Arizona are hereby adopted, and the

Tribal Chairman and the White Mountain Apache Tribe Clerk are hereby authorized to sign and attest each map as the official Off Airport Land Use Drawing of the White Mountain Apache Tribe, Arizona, and such maps shall be filed and maintained as follows:

1) One (1) copy shall be filed for permanent record in the office of the White Mountain Apache Tribe Clerk and shall be designated as Exhibit 1. This copy shall not be changed in any manner.

2) One (1) copy shall be filed in the office of the Director of Planning and shall be designated as Exhibit 2. This copy shall be maintained by the Planning Department by posting thereon all subsequent changes and amendments.

3) One (1) copy shall be filed in the office of the Airport Manager and shall be designated as Exhibit 3. This copy shall be maintained by the Planning Department by posting thereon all subsequent changes and amendments.

3. AIRPORT COMPATIBLE LAND USE OVERLAY ZONING DISTRICT BOUNDARIES

A. The Airport Compatible Land Use Overlay Zoning District boundary lines shown on the official Off Airport Land Use Drawing shall be located and delineated along contour lines established for Cibecue Airport. Where uncertainty exists as to the boundaries of the Airport Compatible Land Use Overlay Zoning Districts as shown on the official Map, the following rules shall apply:

1) Boundaries shall be scaled from the nearest runway end shown on the map.

2) Boundaries shall be scaled from the nearest physical feature shown on the map.

3) Boundaries may be scaled from the nearest platted lot line as shown on the map.

4) Distances not specifically indicated on the original Off Airport Land Use Drawing shall be determined by a scaled measurement on the map.

B. Where physical features on the ground differ from the information shown on the official Off Airport Land Use Drawing or when there arises a question as to how or where a parcel of property is zoned and such questions cannot be resolved by the application of Section V-3A, the property shall be considered to be classified as the most restrictive Airport Compatible Land Use Overlay Zoning District.

C. Where a parcel of land lies within more than one (1) Airport Compatible Land Use Overlay Zoning District, the zone within which each portion of the property is located shall apply individually to each portion of the development.

4. USE OF LAND AND BUILDINGS

A. Within the Airport Compatible Land Use Overlay Zoning Districts as defined herein, no land shall hereafter be used and no structure or other object shall hereafter be erected, altered, converted, or modified other than for those compatible land uses permitted by underlying comprehensive zoning districts, as specified in the White Mountain Apache Tribe Land Use Code. Additional land uses are prohibited in the Airport Compatible Land Use Overlay Zoning Districts, regardless of underlying

zoning, as set forth in the Land Use Compatibility Table included in Attachment A.

B. Where any use of prohibited land and buildings set forth in Section V-4A conflicts with any use of land and buildings set forth in the White Mountain Apache Tribe Land Use Code, as an allowed use on the Zoning District Map, this chapter shall apply.

C. Section V-4 does not apply to property within the official boundaries of the airport.

D. Where specified on the Airport Compatible Land Use Table, the property owner shall dedicate, in advance of receiving a building permit, an aviation clear zone easement to the White Mountain Apache Tribe, Arizona. The purpose of this easement shall be to establish a maximum height restriction on the use of property and to hold the public harmless for any damages caused by noise, vibration, fumes, dust, fuel, fuel particles, or other effects that may be caused by the operation of aircraft landing at, taking off from, or operating on, or at, public airport facilities.

5. ADDITIONAL LAND USE REGULATIONS

A. Within the White Mountain Apache Reservation, Arizona the more restrictive of the White Mountain Apache Tribe Land Use Code or Section V-4A, shall apply to the development of all property covered by the Off Airport Land Use Drawing.

B. On property within the Off Airport Land Use Drawing jurisdiction, but outside the jurisdictional limits of the White Mountain Apache Reservation, Arizona, Section V-4A shall apply to formulate land use recommendations or responses to land use comment requests from other jurisdictions.

C. When a provision of this section conflicts with any airport height hazard restrictions, the most restrictive provision shall apply.

D. Notwithstanding any other provisions of this chapter or other chapter of the White Mountain Apache Tribe Land Use Code, no use may be made of land, water, or structures within any zone established by this chapter in such a manner as to create electrical interference with navigational signals or radio communication between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and others, or result in glare in the eyes of pilots using the airport; impair visibility in the vicinity of the airport; create bird strike hazards, or otherwise in any way endanger or interfere with the landing, taking off, or flight operations of aircraft utilizing the airport.

E. When a subdivision plat is required for any property within an Airport Compatible Land Use Overlay Zoning District or within an area shown on the FAR Part 77 Airspace Drawing for Cibecue Airport, the property owner shall dedicate an aviation hazard easement to the White Mountain Apache Tribe over and across that property. This easement shall establish a height restriction on the use of the property and hold the public harmless from any damages caused by noise, vibration, fumes, dust, fuel, fuel particles, or other effects that may be caused by the operation of aircraft taking off, landing, or operating on or near the Cibecue Airport.

SECTION VI

NONCONFORMING USES

1. REGULATIONS NOT RETROACTIVE - The regulations prescribed by this ordinance shall not be construed to require the removal, lowering, or other change or alteration of any structure or tree not conforming to the regulations as of the effective date of this ordinance, or otherwise interfere with the continuance of nonconforming use. Nothing contained herein shall require any change in the construction, alteration, or intended use of any structure, the construction or alteration of which was begun prior to the effective date of this ordinance, and is diligently prosecuted. Nonconforming land uses existing as of the effective date of this ordinance may be modified such that 1) only existing structures may be enlarged or expanded; 2) that they do not result in any greater violation of height restrictions; and 3) a variance in accordance with Section VII-4 is obtained.

2. MARKING AND LIGHTING - Notwithstanding the preceding provision of this section, the owner of any existing nonconforming structure or tree is hereby required to permit the installation, operation, and maintenance thereon of such markers and lights as shall be deemed necessary by the White Mountain Apache Tribe to indicate to the operators of aircraft in the vicinity of the airport the presence of such airport obstruction. Such markers and lights shall be installed, operated, and maintained at the expense of the Cibecue Airport.

SECTION VII

PERMITS

1. FUTURE USES - Except as specifically provided in A and B hereunder, no material change shall be made in the use of land, no structure shall be erected or otherwise established, and no tree shall be planted in any zone hereby created unless a permit therefore shall have been applied for an granted. Each application for a permit shall indicate the purpose for which the permit is desired, with sufficient particularity to permit it to be determined whether the regulating use, structure, or tree would conform to the regulations herein prescribed. An FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, shall accompany each application. If such determination is in the affirmative, the permit shall be granted. No permit for a use inconsistent with the provisions of this ordinance shall be granted unless a variance has been approved in accordance with Section VII, 4.

   A. In the area lying within the limits of the approach zone, transition zone, horizontal zone, and conical zone, no permit shall be required by this ordinance for any tree or structure less than 200 feet above ground level which is also lower than an imaginary surface extending outward and upward at a slope of 100 feet horizontal for each 1 foot vertical beginning at the closest point of the closest runway.

   B. Nothing contained in any of the foregoing exceptions shall be construed as permitting or intending to permit any construction, or alteration of any structure, or growth of any tree in excess of any of the height limits established by this ordinance.

2. EXISTING USES - No permit shall be granted that would allow the establishment or creation of any obstruction or permit a nonconforming use, structure, or tree to become a greater hazard to air navigation than it was on the effective date of this ordinance or any amendments thereto or than it is when the application for a permit is made. Except as indicated, all applications for such a permit shall be granted.

3. NONCONFORMING USES ABANDONED OR DESTROYED - Whenever the White Mountain Apache Tribe determines that a nonconforming tree or structure has been abandoned or more than 80 percent torn down, physically deteriorated, or decayed, no permit shall be granted that would allow such structure or tree to exceed the applicable height limit or otherwise deviate from the zoning regulations.

4. VARIANCES - Any person desiring to erect or increase the height of any structure, or permit the growth of any tree, or use property, not in accordance with the regulations prescribed in this ordinance, may apply to the Board of Adjustment for a variance from such regulations. The application for variance shall be accompanied by a determination from the Federal Aviation Administration as to the effect of a proposal on the operation of air navigation facilities and the safe, efficient use of navigable airspace. Such variances shall be allowed where it is duly found that a literal application or enforcement of the regulations will result in unnecessary hardship and relief granted, will not be contrary to the public interest, will not create a hazard to air navigation, will do substantial justice, and will be in accordance with the spirit of this ordinance.

   Additionally, no application for variance to the requirements of this ordinance may be considered by the Board of Adjustment unless a copy of the application has been furnished to the White Mountain Apache Tribe for advice as to the aeronautical effects of the variance. If the White Mountain Apache Tribe does not respond to the application within fifteen (15) days after receipt, the Board of Adjustment may act on its own to grant or deny said application.

5. OBSTRUCTION MARKING AND LIGHTING - Any permit or variance granted may, if such action is deemed advisable to effectuate the purpose of this ordinance and be reasonable in the circumstances, be so conditioned as to require the owner of the structure or tree in question to install, operate, and maintain, at the owner's expense, such markings and lights as condition may require in accordance with FAA provisions.

SECTION VIII

ENFORCEMENT

It shall be the duty of the White Mountain Apache Tribe to administer and enforce the regulations prescribed herein. Applications for permits and variances shall be made to the White Mountain Apache Tribe upon a form published for that purpose. Applications required by this ordinance to be submitted to the White Mountain Apache Tribe shall be promptly considered and granted or denied. Application for action by the Board of Adjustment shall be forthwith transmitted by the White Mountain Apache Tribe.

SECTION IX

BOARD OF ADJUSTMENT

1. There is hereby created a Board of Adjustment to have and exercise the following powers: (1) to hear and decide appeals from any order, requirements, decision, or determination made by the White Mountain Apache Tribe in the enforcement of this ordinance; (2) to hear and decide special exceptions to the terms of this ordinance upon which such Board of Adjustment under such regulations may be required to pass; and (3) to hear and decide specific variances.

2. The Board of Adjustment shall consist of members appointed by the White Mountain Apache Tribe and each shall serve for a term of __#__ years until a successor is duly appointed and qualified. Of the members first appointed one shall be appointed for a term of __#__ years. Members shall be removable by the appointing authority for cause, upon written charges, after a public hearing.

3. The Board of Adjustment shall adopt rules for its governance and in harmony with the provisions of this ordinance. Meetings of the Board of adjustment shall be held at the call of the chairperson and at such other times as the Board of Adjustment may determine. The chairperson or, in the absence of the chairperson, the acting chairperson may administer oaths and compel the attendance of witnesses. All hearings of the Board of Adjustment shall be public. The Board of Adjustment shall keep minutes of its proceedings showing the vote of each member upon each questions; or if absent or failing to vote, indicating such fact, and shall keep records of its examinations and other official actions all of which shall immediately be filed in the office of the White Mountain Apache Tribe Planning and Zoning Department and on due cause shown.

4. The Board of Adjustment shall make written findings of facts and conclusions of law giving the facts upon which it acted and its legal conclusions from such facts in reversing, affirming, or modifying any order requirement, decision, or determination which comes before it under the provisions of this ordinance.

5. The concurring vote of a majority of the members of the Board of Adjustment shall be sufficient to reverse any order, requirement, decision, or determination of the White Mountain Apache Tribe or decide in favor of the application on any matter upon which it is required to pass under this ordinance, or to effect variation to this ordinance.

SECTION X

APPEALS

1. Any person aggrieved, or any taxpayer affected, by any decision of the White Mountain Apache Tribe made in the administration of the ordinance, may appeal to the Board of Adjustment.

2. All appeals hereunder must be taken within a reasonable time as provided by the rules of the Board of Adjustment, by filing with the White Mountain Apache Tribe a notice of appeal specifying the grounds thereof. The White Mountain Apache Tribe shall forthwith transmit to the Board of Adjustment all the papers constituting the record upon which the action appealed from was taken.

3. An appeal shall stay all proceedings in furtherance of the action appealed from unless the White Mountain Apache Tribe certifies to the Board of Adjustment, after the notice of appeal has been filed with it, that by reason of the facts stated in the certificate a stay would in the opinion of the White Mountain Apache Tribe cause imminent peril to life or property. In such case, proceedings shall not be stayed except by the order of the Board of Adjustment on notice to the White Mountain Apache Tribe and on due cause shown.

4. The Board of Adjustment shall fix a reasonable time for hearing appeals, give public notice and due notice to the parties in interest, and decide the same within a reasonable time. Upon the hearing, any party may appear in person or by agent or by attorney.

5. The Board of Adjustment may, in conformity with the provisions of this ordinance, reverse or affirm, in whole or in part, or modify the order, requirement, decision, or determination appealed form and may make such order, requirement, decision, or determination as may be appropriate under the circumstances.

SECTION XI

JUDICIAL REVIEW

Any person aggrieved, or any taxpayer affected, by any decision of the Board of Adjustment, may appeal to the Court of _____ a provided in Section _____ of Chapter _____ of the Public Laws of _____.

SECTION XII

PENALTIES

Each violation of this ordinance or of any regulations, order, or ruling promulgated hereunder shall constitute a misdemeanor and shall be punishable by a fine of not more than _____ dollars or imprisonment for not more than _____ days or both; and each day a violation continues to exist shall constitute a separate offense.

SECTION XIII

CONFLICTING REGULATIONS

Where there exists a conflict between any of the regulations or limitations prescribed in this ordinance and any other regulations applicable to the same area, whether the conflict be with respect to the height of structures or trees, and the use of land, or any other matter, the more stringent limitation or requirements shall govern and prevail.

SECTION XIV

SEVERABILITY

If any of the provisions of this ordinance or the application thereof to any person or circumstances are held invalid, such invalidity shall not affect other provisions or applications of the ordinance which can be given effect without the invalid provision or application, and to this end, the provisions of this ordinance are declared to be severable.

SECTION XV

EFFECTIVE DATE

WHEREAS, the immediate operation of the provisions of this ordinance is necessary for the preservation of the public health, public safety, and general welfare, and emergency is hereby declared to exist, and this ordinance shall be in full force and effect from and after its passage by the White Mountain Apache Tribe and publication and posting as required by law. Adopted by this _____ day of _____, 20____.

ATTACHMENT A
LAND USE COMPATIBILITY TABLE

LAND USE CATEGORY	AIRPORT INFLUENCE ZONE (AIZ)	TRAFFIC PATTERN ZONE (TPZ)	APPROACH ZONE (AZ)	RUNWAY PROTECTION ZONE (RPZ)
RESIDENTIAL				
Single-Family, Nursing Homes, Mobile Homes, Multi-Family, Apartments, condominiums	+	o(3)	-(1,3)	--
PUBLIC				
Schools, Libraries, Hospitals	+	o(3)	-(3)	--
Churches, Auditoriums, Concert Halls	+	o(3)	-(3)	--
Transportation, Parking, Cemeteries	++	++	++	-(2,5)
COMMERCIAL & INDUSTRIAL				
Offices, Retail Trade	++	+	o(3)	--
Service Commercial, Wholesale Trade, Warehousing, Light Industrial	++	+	o(3)	--
General Manufacturing, Utilities, Extractive industry	++	++	o(3)	o(3)
AGRICULTURAL & RECREATIONAL				
Cropland	++	++	++	++
Livestock Breeding	++	++	++	-(2)
Parks, Playgrounds, Zoos, Golf Courses, Riding Stables, Water Recreation	++	++	++	-(2)
Outdoor Spectator Sports,	++	+	-(3)	--
Amphitheaters	o	-(4)	--	--
Open Space	++	++	++	++

++ Clearly Acceptable + Normally Acceptable o Marginally Acceptable - Normally Unacceptable - Clearly Unacceptable

Note: Development projects which are wildlife attractant, including sewerage ponds and landfills, within 10,000 feet of the airport are unacceptable. (Ref.: FAA AC 150/5200-33)

Conditions:

(1) If allowed, avigation easements and disclosure must be required as a condition of development.

(2) Any structures associated with uses allowed in the RPZ must be located outside the RPZ.

(3) If no reasonable alternative exists, use should be located as far from extended centerline as possible.

(4) If no reasonable alternative exists, use should be located as far from extended runway centerline and traffic patterns as possible.

(5) Transportation facilities in the RPZ (i.e. roads, railroads, waterways) must be configured to comply with Part 77 requirements.

AVIGATION EASEMENT
WHITE MOUNTAIN APACHE TRIBE

WHEREAS, _____, hereinafter called the Grantor, is the owner in fee of that certain parcel of land situated on the White Mountain Apache Reservation, Arizona, more particularly described as follows and hereinafter called "Grantor's Property":

NOW, THEREFORE, in consideration of the sum of _____ dollars and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Grantor, for himself, his heirs, administrators, executors, successors and assigns, does hereby grant, bargain, sell, and convey unto the White Mountain Apache Tribe hereinafter called the Grantee, its successors and assigns, for the use and benefit of the public, as easement and right-of-way, appurtenant to the Cibecue Airport for the unobstructed use and passage of all types of aircraft by whomsoever owned and operated.

Said easement shall be appurtenant to and for the benefit of the real property now known as the Cibecue Airport including any additions thereto wherever located, thereafter made by the Cibecue Airport or its successors and assigns, guests, and invites, including any and all persons, firms, or corporations operating aircraft to or from the airport.

Said easement and burden, together with all things which may be alleged to be incident to or resulting from the use and enjoyment of said easement, including, but not limited to the right to cause in all air space above or in the vicinity of the surface of Grantor's property such noise, vibrations, fumes, deposits of dust or other particulate matter, fuel particles (which are incidental to the normal operation of said aircraft), fear, interference with sleep and communication and any and all other effects that may be alleged to be incident to or caused by the operation of aircraft over or in the vicinity of Grantor's property or in landing at or taking off from, or operating at or on said Cibecue Airport, and Grantor does hereby fully waive, remise, and release any right or cause of action which he may now have or which he may have in the future against Grantee, its successor and assigns, due to such noise, vibrations, fumes, dust, fuel particles and all other effects that may be caused or may have been caused by the operation of aircraft landing at, or taking off from, or operating at or on said Cibecue Airport.

As used herein, the term "aircraft" shall mean any and all types of aircraft, whether now in existence or thereafter manufactured and developed, to include, but not limited to, jet aircraft,

propeller driven aircraft, civil aircraft, military aircraft, commercial aircraft, helicopters and all types of aircraft or vehicles now in existence or hereafter developed, regardless of existing or future noise levels, for the purpose of transporting persons or property through the air, by whomsoever owned or operated.

The easement and right-of-way hereby granted includes the continuing right in the grantee to prevent the erection or growth upon Grantor's property of any building, structure, tree, or other object which constitutes an obstruction to navigable airspace, and to remove from said air space, or at the sole option of the Grantee, as an alternative, to mark and light as obstructions to air navigation, any such building, structure, tree or other objects now upon, or which in the future may be upon Grantor's property, together with the right of ingress to, egress from, and passage over Grantor's property for the above purpose.

TO HAVE AND TO HOLD said easement and right-of-way, and all rights appertaining thereto unto the Grantee, its successors and assigns, until said Cibecue Airport shall be abandoned and shall cease to be used for public airport purposes.

AND for the consideration hereinabove set forth, the Grantor, for himself, his heirs, administrators, executors, successors, and assigns, does hereby agree that for and during the life of said easement and right-of-way, he will not hereafter erect, park, permit the erection or growth of, or permit or suffer to remain upon Grantor's property, any building, structure, tree or other object such that it creates an obstruction to navigable airspace, and that he shall not hereafter use or permit or suffer the use of Grantor's property in such a manner as to create electrical interference with radio communication between any installation upon said airport and aircraft, or as to make it difficult for flyers to distinguish between airport lights and other, or to permit any use of the Grantor's property that causes a discharge of fumes, dust or smoke so as to impair visibility in the vicinity of the airport or as otherwise to endanger the landing, taking off or maneuvering of aircraft. Grantor furthermore waives all damages and claims for damages caused or alleged to be caused by or incidental to such activities.

It being understood and agreed that aforesaid covenants and agreements shall run with the land and shall be forever binding upon the heirs, administrators, executors, successors, and assigns of the Grantor.

IN WITNESS WHEREOF the Grantor has hereunto set his hand this _____ day of _____ , 20__.

_____
Grantor

Signed, sealed and delivered in the presence of:

STATE OF Arizona)
)SS
White Mountain Apache Tribe)

The foregoing instrument was acknowledged before me this _____ day of _____, 20__ by _____(Grantor).

WITNESS my hand and official seal.

My Commission expires:

_____
Notary Public

Appendix D
Commonly Used Acronyms

Cibecue
Airport Master Plan

COMMONLY USED ACRONYMS

AC	Advisory Circular
AD	Airport Design
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ARC	Airport Reference Code
ARP	Airport Reference Point
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance
ASR	Airport Surveillance Radar
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
AWOS	Automated Weather Observation system
BRL	Building Restriction Line
CAT	Category
CFR	Code of Federal Regulations
CWY	Clearway
CY	Calendar Year
DME	Distance Measuring Equipment
EL	Elevation
EMT	Emergency Medical Technician
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FSS	Flight Service System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IEMT	Intermediate Emergency Medical Technician
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
LOC	Localizer
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashers
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ME	Multi-Engine
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operating Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NDB	Nondirectional Beacon
NM	Nautical Mile
NPIAS	National Plan of Integrated Airport Systems
ODALS	Onmnidirectional Approach Lighting System
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
RAIL	Runway alignment Indicator Lights
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
RW	Runway
SWY	Stopway
TH	Threshold
TL	Taxilane
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TVOR	Very High Frequency Omnirange on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omnirange

Appendix E
Glossary of Terms

Cibecue
Airport Master Plan

GLOSSARY OF TERMS

Above Ground Level (AGL)	A height above ground as opposed to MSL (height above Mean Sea Level).
Advisory Circular (AC)	Publications issued by the FAA to provide a systematic means of providing non-regulator guidance and information in a variety of subject areas.
Airport Improvement Program (AIP)	The AIP of the Airport and Airways Improvement Act of 1982 as amended. Under this program, the FAA provide funding assistance for the design and development of airports and airport facilities.
Aircraft Mix	The number of aircraft movements categorized by capacity group or operational group and specified as a percentage of the total aircraft movements.
Aircraft Operation	An aircraft takeoff or landing.
Airport	An area of land or water used or intended to be used for landing and takeoff of aircraft, includes buildings and facilities, if any.
Airport Elevation	The highest point of an airport's useable runways, measured in feet above mean sea level.
Airport Hazard	Any structural or natural object located on or near a public airport, or any use of land near such airport, that obstructs the airspace required for flight of aircraft on approach, landing, takeoff, departure, or taxiing at the airport.
Airport Land Use Regulations	Are designed to preserve existing and/or establish new compatible land uses around airports, to allow land use not associated with high population concentration, to minimize exposure of residential uses to critical aircraft noise areas, to avoid danger from aircraft crashes, to discourage traffic congestion and encourage compatibility with non-motorized traffic from development around airports, to discourage expansion of demand for governmental services beyond reasonable capacity to provide services and regulate the area around the airport to minimize danger to public health, safety, or property from the operation of the airport, to prevent obstruction to air navigation and to aid in realizing the policies of a County Comprehensive Plan and Airport Master Plan.
Airport Layout Plan (ALP)	A graphic presentation, to scale, of existing and proposed airport facilities, their location on the airport and the pertinent applicable standards. To be eligible for AIP funding assistance, an airport must have an FAA-approved ALP.

Airport Master Record, Form 5010	The official FAA document, which lists basic airport data for reference and inspection purposes.
Airport Reference Code (ARC)	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.
Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airspace	Space above the ground in which aircraft travel; divided into corridors, routes and restricted zones.
Air Traffic	Aircraft operating in the air or on an airport surface, excluding loading ramps and parking areas.
Approach Surface	A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
Automated Weather Observing System (AWOS)	This equipment automatically gathers weather data from various locations on the airport and transmits the information directly to pilots by means of computer generated voice messages over a discrete frequency.
Based aircraft	An aircraft permanently stationed at an airport.
Building Restriction Line	A line, which identifies suitable building area locations on airports.
Ceiling	The height above the earth's surface of the lowest layer of clouds or other phenomena which obscure vision.
Conical Surfaces	A surface extending outward and upward form the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
Controlled Airspace	Airspace in which some or all aircraft may be subject to air traffic control to promote safe and expeditious flow of air traffic.
Critical/Design Aircraft	In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft need not be critical for all design items.

Day Night Level (DNL)	24-hour average sound level, including a 10 decibel penalty for sound occurring between 10:00 PM and 7:00 AM
Decibel	Measuring unit for sound based on the pressure level.
Design Type	The design type classification for an airport refers to the type of runway that the airport has based upon runway dimensions and pavement strength.
Federal Aviation Administration (FAA)	The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.
FAR Part 77	A definition of the protected airspace required for the safe navigation of aircraft.
Fixed Base Operator (FBO)	An individual or company located at an airport and providing commercial general aviation services.
Fuel Flowage Fees	A fee charged by the airport owner based upon the gallons of fuel either delivered to the airport or pump at the airport.
General Aviation (GA)	All aviation activity in the United States, which is neither military nor conducted by major, national or regional airlines.
Glider	A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine (FAR Part 1),
Global Positioning System (GPS)	The global positioning system is a space based navigation system, which has the capability to provide highly accurate three-dimensional position, velocity and time to an infinite number of equipped users anywhere on or near the Earth. The typical GPS integrated system will provide: position, velocity, time, altitude, groundspeed and ground track error, heading and variation. The GPS measures distance, which it uses to fix position, by timing a radio signal that starts at the satellite and ends at the GPS receiver. The signal carries with it, data that discloses satellite position and time of transmission and synchronizes the aircraft GPS system with satellite clocks.
Hazard to Air Navigation	An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities or existing or potential airport capacity.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter which is constructed by swinging arcs of specified radii form the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.

Imaginary Surfaces	Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28 and 77.29 of FAR Part 77, *Objects Affecting Navigable Airspace*. Such surfaces include the approach, horizontal, conical, transitional, primary and other surfaces.
Itinerant Operations	All operations at an airport, which are not local operations.
Jet Noise	The noise generated externally to a jet engine in the turbulent jet exhaust.
Knots	Nautical miles per hour, equal 1.15 statute miles per hour.
Large Airplane	An airplane of more than 12,500 pounds maximum certified takeoff weight.
Local Operations	Operations by aircraft flying in the traffic pattern or within sight of the control tower, aircraft known to be arriving or departing from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
Location Identifier	A three-letter or other code, suggesting where practicable, the location name that it represents.
Maneuvering Area	That part of an airport to be used for the takeoff and landing of aircraft and for the movement of aircraft associated with takeoff and landing, excluding aprons.
Master Plan	A planning document prepared for an airport, which outlines directions and developments in detail for 5 years and less specifically for 20 years. The primary component of which is the Airport Layout Plan.
Mean/Maximum Temperature	The average of all the maximum temperatures usually for a given period of time.
Mean Sea Level (MSL)	Height above sea level.
Medium Intensity Runway Lights (MIRL)	For use on VFR runways or runway showing a nonprecision instrument flight rule (IFR) procedure for either circling or straight-in approach.
Minimum Altitude	That designated altitude below which an IFR pilot is not allowed to fly unless arriving or departing an airport or for specific allowable flight operations.

National Airspace System	The common network of United States airspace, navigation aids, communications facilities and equipment, air traffic control equipment and facilities, aeronautical charts and information, rules, regulations, procedures, technical information and FAA manpower and material.
National Plan of Integrated Airport Systems (NPIAS)	A plan prepared annually by the FAA which identifies, for the public, the composition of a national system of airports together with the airport development necessary to anticipate and meet the present and future needs of civil aeronautics, to meet requirements in support of the national defense and to meet the special needs of the Postal Service. The plan includes both new and qualitative improvements to existing airports to increase their capacity, safety, technological capability, etc.
NAVAID	A ground based visual or electronic device used to provide course or altitude information to pilots.
Noise	Defined subjectively as unwanted sound. The measurement of noise involve understanding three characteristics of sound: intensity, frequency and duration.
Noise Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. DNL is the measure used to describe community exposure to noise.
Noise Exposure Level	The integrated value, over a given period of time of a number of different events of equal or different noise levels and durations.
Non-Precision Instrument	A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance for which a straight-in nonprecision instrument approach procedure has been approved.
Notice to Airmen (NOTAM)	A notice containing information (not known sufficiently in advance to publicize by other means concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.
Object	Includes, but is not limited to, above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain and parked aircraft.
Object Free Area (OFA)	A two-dimensional ground area-surrounding runways, taxiways and taxilanes which is clear of objects except for object whose location is fixed by function.

Obstacle Free Zone (OFZ)	The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.
Obstruction	An object which penetrates an imaginary surface described in the FAA's Federal Aviation Regulations (FAR), Part 77.
Parking Apron	An apron intended to accommodate parked aircraft.
Pattern	The configuration or form of a flight path flown by an aircraft or prescribed to be flown, as in making an approach to a landing
Precision Approach Path Indicators (PAPI)	The visual approach slope indicator system furnishes the pilot visual slope information to provide safe descent guidance. It provides vertical visual guidance to aircraft during approach and landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that they are "on path" if they see red/white, "above path" if they see white/white and "below path" if they see red/red.
Primary Surface	A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway, but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway.
Rotating Beacon	A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport.
Runway	A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.
Runway End Identifier Lights (REIL)	REILs are flashing strobe lights which aid the pilot in identifying the runway end at night or in bad weather conditions.
Runway Gradient	The average gradient consisting of the difference in elevation of the two ends of the runway divided by the runway length may be used provided that no intervening point on the runway profile lies more than five feet above or below a straight line joining the two ends of the runway. In excess of five feet the runway profile will be segmented and aircraft data will be applied for each segment separately.
Runway Lighting System	A system of lights running the length of a system that may be either high intensity (HIRL), medium intensity (MIRL), or low intensity (LIRL).
Runway Orientation	The magnetic bearing of the centerline of the runway.

Runway Protection Zone (RPZ)	An area off the runway end used to enhance the protection of people and property on the ground.
Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion form the runway.
Segmented Circle	A basic marking device used to aid pilots in locating airports and which provides a central location for such indicators and signal devices as may be required.
Small Aircraft	An airplane of 12,500 pounds or less maximum certified takeoff weight.
Taxiway	A defined path established for the taxiing of aircraft from one part of an airport to another.
Terminal Area	The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops and other service buildings, automobile parking, airport motels, restaurants, garages and automobile services and a specific geographical area within which control of air traffic is exercised.
Threshold	The beginning of that portion of the runway available for landing.
Touch and Go Operations	Practice flight performed by a landing touch down and continuous takeoff without stopping.
Traffic Pattern	The traffic flow that is prescribed for aircraft landing at, taxiing on or taking off form an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.
Transitional Surface	These surfaces extend outward and upward at right angles to runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
Universal Communications (UNICOM)	A private aeronautical advisory communications facility for purpose other than air traffic control. Only one such station is authorized in any landing area. Service available are advisory in nature primarily concerning the airport services and airport utilization. Locations and frequencies of UNICOMs are listed on aeronautical charts and publications.
Visual Flight Rules (VFR)	Rules that govern flight procedures under visual conditions.
Visual Runway	A runway intended for visual approaches only with no straight-in instrument approach procedure either existing or planned for that runway.