AIRPORT MASTER PLAN

Final Report

ANIMAS AIRPARK

DURANGO, COLORADO | SEPTEMBER 2015

ARMSTRONG

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INTRODUCTION

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

INTRODUCTION

Introduction

The Animas Airpark Property Owners Association, as the Airport Sponsor, is continuing its efforts to plan for future development of Durango-Animas Airpark. Armstrong Consultants, Inc. was tasked to undertake this Airport Master Plan (AMP) update for Durango-Animas Airpark located in Durango, Colorado. The overall study will follow the process outlined in the Federal Aviation Administration's (FAA) Advisory Circular 150/5070-6B, *Airport Master Plans*. The future development shown in the AMP is designed to: enhance air and ground operations and safety and accommodate existing and forecasted aircraft demand. The preparation of this AMP is evidence that the Animas Airpark Property Owners Association recognizes the significance of air transportation to the community as well as the requirement for a systematic approach to evaluating the Airport's unique operating and improvement needs.

An AMP is intended to be a proactive document which identifies and plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the Airport Authority can coordinate project approvals, design, financing and construction to avoid experiencing unfavorable effects due to inadequate or constrained airport facilities. With a sound and realistic AMP, Durango-Animas Airpark can maintain its role as an important link to the national air transportation system for the community.

Purpose

The purpose of the AMP is to provide a framework to guide future airport development that cost-effectively satisfies local and regional aviation demand, while producing an efficient, economical and environmentally compliant facility and the mitigation of potential impacts. The AMP considers the possible environmental, socioeconomic and financial costs associated with alternative development concepts as well as the possible means of avoiding, minimizing, or mitigating impacts to an appropriate level of detail for facilities planning.

The document describes and depicts the overall concept for long-term development of the airport. It presents the concepts graphically in the Airport Layout Plan (ALP) drawing set and reports the data and logic upon on which the concept is based in the AMP report.

Objectives

The primary objectives of the AMP are to produce an attainable phased development plan concept that will satisfy the airport's needs in a safe, efficient, economical and environmentally sound manner. Goals and objectives are integral to the definition and validity of any plan and serve to frame and direct the definition of options, and more importantly, to establish evaluation

criteria to be used in assessing the viability and benefits of such options. The plan serves as a guide to decision makers, airport users and the general public for implementing airport development actions while considering both airport and community concerns and objectives. There are a number of objectives that the Airport would like to achieve as a result of this AMP.

Objectives of the AMP include:

- Document the information that the proposed development will address.
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term Capital Improvement Program (CIP).
- Propose an achievable financial plan to support the implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the information and satisfies local, state and Federal regulations.
- Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls and other policies necessary to preserve the integrity of the airport and its surroundings.
- Set the stage and establish the framework for a continuing planning process that will monitor key conditions and permit changes in plan recommendations as required.

Airport Master Plan Process and Schedule

Airport planning takes place at a national, state, regional and local level. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning agencies. 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 systems plans. The Airport Master Planning process involves collecting data, forecasting demand, determining facility requirements, studying various alternatives and developing plans and schedules. The flow chart in **Figure 1** depicts the steps in the master planning process. This process will take into consideration the needs and concerns of the airport sponsor, airport tenants and users, as well as the general public. The AMP is prepared by the operators of individual airports and is usually completed with the assistance of consultants.

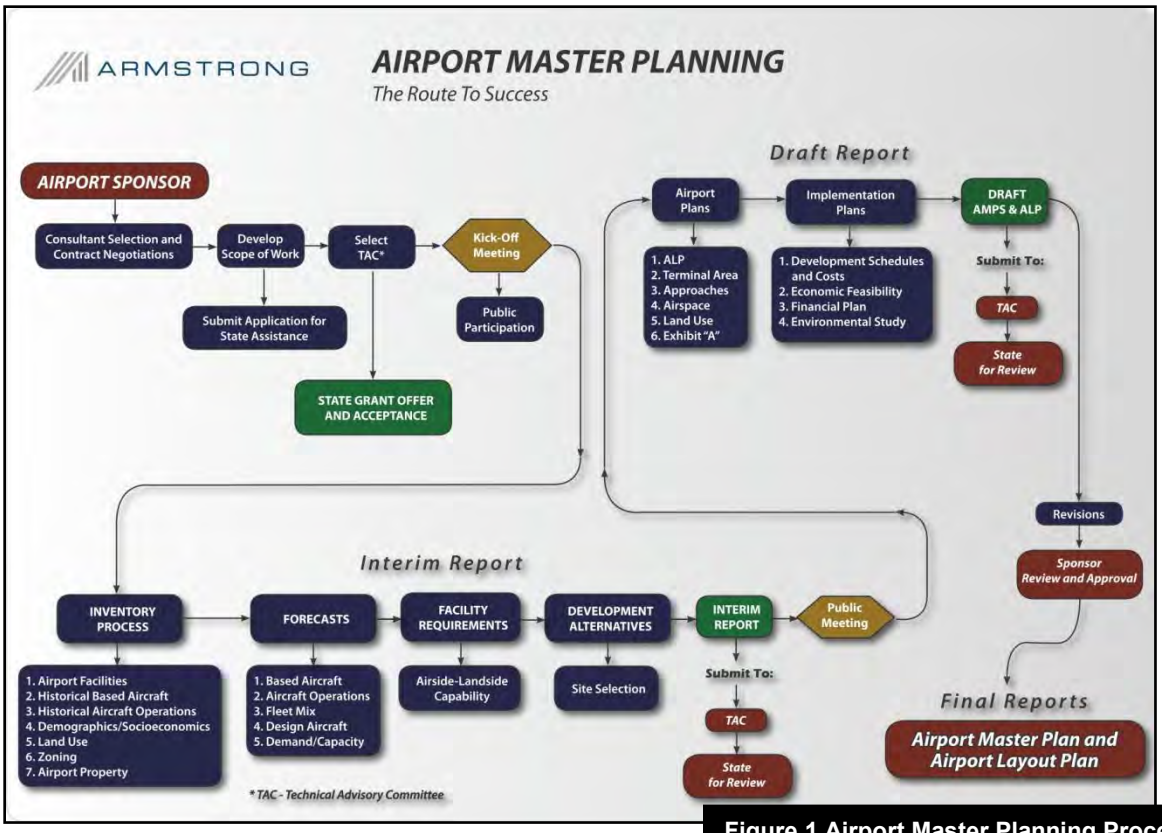

Figure 1 Airport Master Planning Process

Technical Advisory Committee

The Durango-Animas Airpark Technical Advisory Committee (TAC) for this Master Plan consists of members of the Animas Airpark Property Owners Association, City and County governments, airport tenants, citizens and the State. Their involvement throughout the Master Plan process will aid in keeping interested parties informed and will foster consensus for future development actions.

<u>TAC REPRESENTATIVES</u>

- Delvin Gregg, Animas Airpark Board
- Bob Wolff, Animas Airpark Board
- Jerry Zink, Animas Airpark Board
- Greg Hoch, City of Durango
- Greg Boysen, City of Durango
- Damian Peduto, La Plata County
- Jim Davis, P.E., La Plata County
- Kip Turner, Durango-La Plata County Airport
- Dave Dillon, Property Owner
- J.D. Feuquey, Area Resident
- Chuck Lawler, Southern Ute Indian Tribe
- Scott Storie, Colorado Department of Transportation – Aeronautics Division

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CHAPTER ONE

INVENTORY

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER ONE
INVENTORY

1.0 Airpark Description and Setting

The Durango-Animas Airpark is a privately-owned, public use residential, commercial and industrial airpark. An airpark is a community in which the residents typically own aircraft which are stored in hangars integrated with their home or are parked on an aircraft parking apron adjacent to their home or business. Airparks are served by a runway with direct access to residential, industrial or business aircraft parking. The Durango-Animas Airpark is located approximately four miles south of the City of Durango; situated in La Plata County, Colorado. **Figure 1-2** depicts the location of the Durango-Animas Airpark. The Airpark is situated in the Animas River Valley within the San Juan Mountains. Durango's moderate climate along with mountainous terrain provides year-round outdoor activities which has afforded the area with substantial tourism traffic.

The Airpark elevation is 6,684 feet above Mean Sea Level (MSL). The Airpark's geogra hi c location is a titude ' orth and ongitude ' 9 West The Durango-Animas Airpark is owned and operated by the Animas Airpark Property Owners Association. The parcels of land comprising the Airpark are privately owned by individual homeowners or businesses. The Airpark boundary encompasses approximately 35 acres. The Animas Airpark Property Owners Association is a non-profit corporation which provides control of the land use within the designated boundary. Membership within the organization is divided into three tiers: residential, industrial and aviation. The Association has 54 active members. Despite being privately owned and operated, the Animas Airpark is open to the public.

FIGURE 1-1 RUNWAY 1 APPROACH

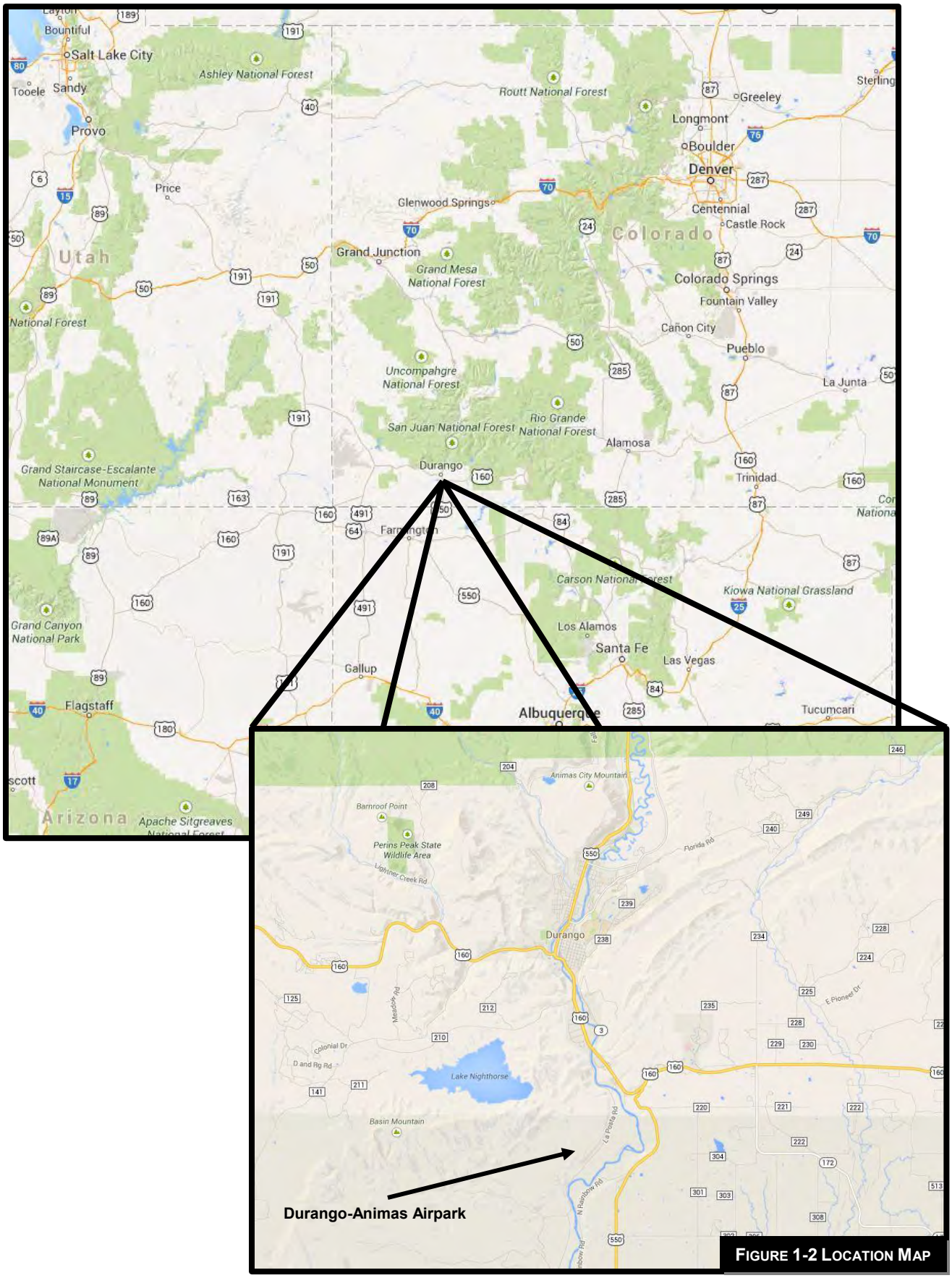


FIGURE 1-2 LOCATION MAP

1.1 Airpark Grant History

The Colorado Department of Transportation Division of Aeronautics (CDOT) provides funding to public use airports located in the State of Colorado for improvements to enhance facility safety or utility. CDOT generates funds to distribute to Colorado airports via sales taxes on Jet-A fuel purchases and excise taxes on AvGas or non-airline Jet-A fuel purchases. All CDOT Aeronautics grant funding is user-generated, does not utilize any State of Colorado General Fund monies and are discretionary. For state-only improvement projects, the State typically funds up to 90 percent of eligible cost with the remaining 10 percent covered by the Animas Airpark Property Owners Association. Durango-Animas Airpark receives funding from CDOT due to the Airpark's accessibility to u blic o erations and high level of activity occurring at the airfield. Durango-Animas Airpark is not eligible for federal grant money as they are not included in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems.

In 2013, Durango-Animas Airpark received a $517,500 grant for the rehabilitation of Runway 1/19. In 2014, Durango-Animas Airpark received a $144,000 grant to undertake this Airport Master Planning study and $256,000 to install a utility water line.

1.2 Service Level

CDOT classifies Colorado airports in three tiers: Major, Intermediate and Minor. Each airport role is determined by a weighted scoring system which evaluated items such as:

- The type and volume of aviation demand the airport accommodates
- The ability of the airport to expand to accommodate either or both additional airside or landside facilities
- The economic support/benefit that the airport provides to the community it serves
- The use of the airport by local or visiting businesses
- The use of the airport to support emergency or medical needs
- The extent of airside and landside facilities and other services available at the airport

Durango-Animas Airpark is classified as an Intermediate airport in the 2012 Colorado Aviation System Plan Update (CASPU). Intermediate airports primarily serve and meet the operating requirements of single engine, multi-engine and general aviation business jet activity.

1.3 Airpark Role

Durango-Animas Airpark provides a vital link between the City of Durango and La Plata County with the State of Colorado and United States.

The majority of the aircraft utilizing the Airpark are single-engine piston, multi-engine piston, turboprop and light turbojet aircraft. Other users include rotorcraft and ultralights. Users include the following aircraft types and operations:

1.3.1 Business and Recreational Transportation

These users desire the utility and flexibility offered by general aviation aircraft. This category includes business as well as tourism related activities. The types of aircraft utilized for personal and business transportation include a mix of single-engine, multi-engine and turbojet aircraft.

1.3.2 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 practice approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor and Airline 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 141 certificated flight schools.

1.4 Existing Activity Levels

There are various federal, state and local sources available for determining existing activity levels at an airport. These include, but are not limited to, the 2012 CASPU, FAA Form 5010-1, on-site inventory and Airpark records.

The FAA Airport Master Record, Form 5010-1, is the official record kept by the FAA to document airport physical conditions and other pertinent information. The information is typically collected from the airport sponsor and through " ins ections conducted by the FAA, State Aeronautics or a contractor. The 5010 includes an annual estimate of aircraft activity as well as the number of based aircraft. The accuracy of the information contained in the 5010-1 Form varies directly with the date of its last revision. The current Form FAA 5010-1 for Durango-Animas Airpark indicates 45 based aircraft and 10,950 annual operations. The published based aircraft and total annual operation figures have been confirmed by the Airpark in May 2014. **Table 1-1** lists the based aircraft and fleet mix at Durango-Animas Airpark. **Table 1-2** lists the total annual operations data for the Airpark.

Table 1-1 Based Aircraft at Durango-Animas Airpark

Aircraft Type	Number Based	Percentage of Based Aircraft
Single-Engine Piston	43	96%
Multi-Engine Piston	2	4%
Total	**45**	**100%**

Source: Animas Airpark Property Owners Association, 2014

Table 1-2 Total Annual Operations at Durango-Animas Airpark

Aircraft Type	Number of Operations	Percentage of Operations
Local General Aviation	7,118	65%
Itinerant General Aviation	3,670	34%
Itinerant Air Taxi	162	1%
Total	**10,950**	**100%**

Source: Animas Airpark Property Owners Association, 2014

1.5 Existing Airside Facilities

Airside facilities include the runway configuration, associated taxiway system, aircraft parking area and any visual or electronic approach navigational aids. Existing airside facilities are further described within this section and are depicted in **Figure 1-3**, located at the end of this chapter.

1.5.1 Runway

The number of runways provided at an airport depends largely on the volume of air traffic and prevailing wind conditions. The orientation of the runways depend primarily on the direction of the prevailing wind patterns in the area, the size and shape of the area available for development and land-use or airspace restrictions in the vicinity of the airport.

The runway configuration at the Durango-Animas Airpark consists of one asphalt runway, Runway 1/19, depicted in **Figure 1-4**. Runway 1/19 is 5,010 feet long by 50 feet wide. There is no published pavement strength for Runway 1/19. The runway is marked with basic markings on both ends. The Runway 1/19 surface and runway markings are considered to be in excellent condition.

FIGURE 1-4 RUNWAY 1/19

1.5.2 Taxiway System

Taxiways provide aircraft access between an air ort's parking apron and corresponding runways. They are also intended to expedite aircraft departures from the runway and increase operational safety and efficiency. The taxiway system at Durango-Animas Airpark consists of one public-use connector taxiway (Taxiway A) located 1,480 feet south of Runway 19 and six private connector taxiways. Taxiway A is approximately 30 feet wide. The hold position marking is located approximately 82 feet from the runway centerline. Taxiway A is constructed of asphalt and is in good condition. The pavement markings are in good condition.

1.5.3 Fixed Wing Aircraft and Helicopter Parking Aprons

The fixed wing aircraft apron provides an area for based and transient aircraft parking. The apron is located adjacent to Taxiway A approximately 240 feet from Runway 1/19. The fixed-wing aircraft parking apron encompasses 11,237 square yards of area and includes 17 cable-grounded tie downs for fixed wing aircraft. The apron taxilanes are designed to accommodate taxing aircraft by providing adequate distances to meet wing tip clearance from fixed or movable objects when aligned with the yellow centerline marking. The aircraft parking apron has one non-continuous six-inch yellow centerline stripe. The taxilanes at Durango-Animas Airpark are designed to meet Taxilane Design Group (TDG) I. This requires a 15 foot wingtip clearance.

Fixed or movable objects must be located 39.5 feet and parallel taxiways/taxilanes must be located 64 feet from the taxilane centerline.

There is currently no designated parking area for helicopters. The pavement for the aircraft parking apron is in fair to poor condition. The tiedown position markings are missing. The aircraft parking apron is shown in **Figure 1-5**.

FIGURE 1-5 AIRCRAFT PARKING APRON

1.5.4 Airfield Lighting and Visual Aids

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 features of general aviation airports include:

- Runway edge lights consist of a single row of white lights bordering each side of the runway, outlining the runway edges during periods of darkness or low visibility. Runway edge lights are classified into three types according to the intensity of light of which they are capable of producing: they include High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL) and Low Intensity Runway Lights (LIRL). Both HIRLs and MIRLs have variable intensity settings, whereas LIRLs have only one. Instrument runway lights include yellow edge lights on the last 2,000 feet of runway to visually inform pilots of the amount of runway remaining. At most non-towered airports, runway lights are activated by pilot controlled lighting which is utilized by transmitting a series of “clicks on the radio transmitter to activate and control lighting intensity settings

Runway 1/19 is lighted with non-standard MIRLs. Several of the MIRLs have been destroyed or are missing. The existing MIRLs are stake mounted with direct burial wire. The existing lighting system is considered to be in poor condition. An example of a damaged MIRL at Durango-Animas Airpark is shown in **Figure 1-6**.

FIGURE 1-6 DAMAGED MIRL

- Runway end identifier lights (REIL) consist of a pair of synchronized high intensity white flashing lights placed on each side of the runway to enable rapid identification of the runway threshold. There are no existing REILs at Durango-Animas Airpark.

- Runway markings vary depending on whether the runway is used exclusively for visual flight rule operations (VFR) or instrument flight rule (IFR) operations. A visual runway is typically marked with the runway designator numbers and a dashed white centerline. Threshold bars and aiming point markings are added to a visual runway to provide non-precision instrument markings. A precision instrument runway further includes touchdown zone markings. Runway 1/19 is marked with visual approach markings.

- Taxiway edge lights consist of a single row of blue lights bordering each side of the taxiway. These lights mark the edge of the taxiways and guide aircraft from the runway to the ramp or apron area. Retroreflectors, used in lieu of taxiway lighting, consists of a single row bordering each side of the taxiway of reflective tape mounted on a pole. There is no existing taxiway edge lighting or retroflectors at Durango-Animas Airpark.

- Threshold lights consist of a single row of green lights used to indicate the beginning of the usable landing surface. These lights are two-directional and appear red from the opposite end of the runway to mark the end of the usable runway. There are eight threshold lights at each runway end. The threshold lights at the Runway 19 end are located approximately 150 feet from the pavement surface. The threshold lights at each runway end are considered to be in poor condition.

- A wind direction indicator consists of a windcone, wind tee or tetrahedron. A windcone aligns itself into the wind as the wind blows through a truncated cloth aligning itself with the wind indicating both wind direction and approximate velocity. The tail of a wind tee aligns itself in the wind similar to that of a weather vane. A tetrahedron may either swing around to align the small end pointing into the wind or it may be manually positioned to show landing direction. Wind indicators can be lighted for use during periods of darkness and low visibility.

- A segmented circle is located around the wind direction indicator. The segmented circle has two purposes, including identifying the location of the wind direction indicator and identifying non-standard traffic patterns. The segmented circle at Durango-Animas Airpark is located at the between the aircraft parking apron and Runway 1/19. Additionally, two supplemental wind cones are located adjacent to each runway end.

- Lighted signs indicate connector taxiways and runways.

The airfield lighting and visual aids at Durango-Animas Airpark consists of non-standard MIRLs on Runway 1/19, threshold lights, lighted wind cone and segmented circle. In general, the airfield lighting and visual aids are in fair condition.

1.5.5 Navigational Aids and Instrument Approach Procedures

Durango-Animas Airpark currently does not have any published instrument approach procedures. Enroute radar and coverage for Durango-Animas Airpark is provided by the Denver Air Traffic Control Center. The Denver Flight Service Station (FSS) provides additional weather data and other pertinent weather information to pilots on the ground and enroute. There is no air traffic control tower (ATC) at the airport.

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

The nearest NAVAID is the Durango VOR which is located approximately seven nautical miles southeast of the airport on the 284 degree radial.

1.5.6 Weather Reporting Systems

Automated Surface Observation Systems (ASOS) use various sensors, a voice synthesizer and a radio transmitter to provide accurate weather data. An ASOS reports on-site meteorological conditions such as altimeter setting, wind (direction, gusts and speed), temperature, dew point, visibility, cloud and ceiling. The ASOS transmits over a VHF frequency or the voice portion of a NAVAID. The ASOS functions similarly to an Automated Weather Observation System (AWOS), however the ASOS provides hourly updates and is owned and operated by the National Oceanic and Atmospheric Administration (NOAA) rather than AWOS, which are real-time observations and owned and operated by the by the airport. The transmission can be received within 25 nautical miles of the site or above 3,000 feet Above Ground Level (AGL).

Durango-Animas Airpark is not served by either an ASOS or AWOS. The nearest weather reporting station is the ASOS located at Durango-La Plata County Airport approximately six nautical miles southeast. The frequency for the Durango-La Plata County Airport ASOS is 120.625 Mega hertz and is published on Aeronautical charts as well as in the airport facilities

directory. The Durango-La Plata County Airport ASOS can also be reached via telephone at (970) 259-3579.

1.5.7 Design Standards

FAA AC 150/5300-13A, *Airport Design*, specifies standards for the planning and design of airport facilities. The design standards are based on the Airport Reference Code (ARC), which is based on the most critical aircraft or group of aircraft utilizing the airport on a regular basis (500 operations a year). Airport design standards exist to promote efficient and safe air transit.

Although the airport is not included in the NPIAS, does not receive FAA grant funding and is not required to meet FAA design standards, it is prudent for the Animas Airpark Property Owners Association to meet FAA design standards to the maximum extent practical. This would maximize the safety, efficiency, and utility of the airport. When possible, existing non-standard conditions should be remedied in order to comply with state grant assurances and to promote a safe and efficient configuration of facilities.

1.5.7.1 Airport Reference Code (ARC)

FAA AC 150/5300-13A, *Airport Design*, recommends design standards for use in the design of civil airports. Each runway and operational area serving the particular design aircraft must be identified. Each runway is assigned a Runway Design Code (RDC). The Aircraft Approach Category (AAC), Airplane Design Group (ADG) and approach visibility minimums are combined to determine the RDC. The RDC provides the information needed to determine design standards that apply. The first component, depicted by a letter is the AAC and relates to aircraft approach speed (operational characteristic) (see **Table 1-3**). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics) whichever is most restrictive (see **Table 1-4**). The third component relates to the visibility minimum expressed by RVR values in feet of 1,200, 1,600, 2,400, 4,000 and 5,000 (corresponding to lower than ¼-mile, lower than ½-mile but not lower than ¼-mile, lower than ¾-mile but not lower than ½-mile, lower than 1-mile but not lower than ¾-mile and not lower than 1-mile respectively) (see **Table 1-5**) The third com o nent will read “VIS for runway designed with visual approaches only. Generally, runway standards are related to aircraft approach speed, aircraft wingspan and designated or planned approach visibility minimums.

The Air o rt Reference Code (ARC) of the air o rt signifies the air o rt’s highest RDC The ARC is used for planning and design purpose only and does not limit the aircraft that may be able operate safely on the airport. The current RDC for Runway 1/19 and ARC for Durango-Animas Airpark is B-I (Small)-VIS. Airports in Colorado that are classified as Intermediate are encouraged to meet and maintain an ARC of B-II or greater standards. A more detailed discussion of RDCs and ARCs is included in Chapter Three, *Facility Requirements*. A list of the existing FAA design standards are contained in **Table 1-6.**

Table 1-3 Aircraft Approach Category (AAC)

Aircraft Approach Category	Approach Speed
A	<91 knots
B	>91 knots but <121 knots
C	>121 knots but <141 knots
D	>141 knots but <166 knots
E	166 knots or greater

Table 1-4 Airplane Design Group (ADG)

Group #	Wingspan (ft.)	Tail Height (ft.)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	79' - < 118'	30' - < 45'
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'

Table 1-5 Visibility Minimums

RVR (ft.)	Flight Visibility Category (statue mile)
5,000	Not lower than 1 mile (APV > 1 mile)
4,000	o wer than m ile but not lower than / mile (APV ≥ /4 but < 1 mile)
2,400	Lower than 3/4 mile but not lower than 1/2 (CAT - I PA)
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)
1,200	Lower than 1/4 mile (CAT - III PA)

1.5.7.2 Safety Areas

Runway and taxiway safety areas (RSAs and TSAs) are defined surfaces surrounding the runway and taxiways that are prepared specifically to minimize bodily injury and reduce damage to aircraft and property in the event of an under-shoot, over-shoot or excursion from a runway or taxiway. According to the FAA AC 150/5300-13A, *Airport Design*, 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.
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

The RSA standard for a runway meeting RDC B-I (Small) is 120 feet wide and extends 240 feet beyond each runway end. The maximum allowable grade within a RSA is 1.5 to 5.0 percent. The RSA grades both alongside Runway 1/19 and beyond each runway end exceed the five percent

design standard. Therefore, Runway 1/19 does not have a RSA and does not meet this design standard for RDC B-I (Small).

The TSA for Taxiway A is centered on the taxiway centerline and is 49 feet wide and meets TDG I design standards.

1.5.7.3 Obstacle Free Zone (OFZ) and Object Free Area (OFA)

The 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 NAVAIDs that need to be located in the OFZ because of their function. The runway OFZ is similar to the Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway. The OFA is a two-dimensional area surrounding the runway. The OFA precludes parked aircraft, agricultural operations and all other non-aeronautical function related objects.

The ROFA and ROFZ standard dimensions for a runway meeting RDC B-I (Small) are both 250 feet wide and extend 200 feet beyond each runway end. Trees and tall bushes are located approximately 80 feet from both sides of the runway centerline along the entire runway length. Additionally, a road is located approximately 40 feet off the Runway 1 pavement end. Each of these penetrations reduces the ROFA and ROFZ length and width to 40 feet and 160 feet, respectively.

The TOFA for TDG I is 89 feet centered on the taxiway centerline. Trees and tall bushes are located approximately 35 feet along both sides of the taxiway centerline. These penetrations reduce the TOFA width to 70 feet.

1.5.7.4 Runway Protection Zones (RPZ)

The RPZ is trapezoidal in shape and centered on the extended runway centerline. It begins 200 feet beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the design aircraft, type of operation and visibility minimums. The RPZ dimensions for a B-I (Small) runway with visibility minimums greater than 1-mile are 250 feet at the inner width, 450 feet at the outer width and 1,000 feet in length. While it is desirable to clear all objects from the RPZ, uses that are permissible without further evaluation include farming that meets minimum buffers, irrigation channels as long as they do not attract birds, airport service roads, as long as they are not public roads and are directly controlled by the airport operator, underground facilities and unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ. In order for CDOT Division of Aeronautics funding, any land uses in the RPZ should be consistent with FAA airport design standards and Title 14 Code of Federal Regulations Part 77.

The existing RPZs at Durango-Animas Airpark are not owned nor controlled by the Airport. The Runway 1 Departure / Runway 19 Arrival RPZs are penetrated by a series of hangars. The Runway 1 Arrival / Runway 19 Departure RPZs are penetrated by an access road.

Table 1-6 Design Standards for Durango-Animas Airpark

Description	Runway 1/19
Runway Design Code (RDC)	B-I (Small)-VIS
RW Centerline to Parallel Taxiway	' (one)
RW Centerline to Aircraft Holding Position	' (8 ' Actual)
RW Width	6 ' (' Actual)
RW Safety Area Width	' (' Actual)
RW Safety Area Length Beyond RW End	' (' Actual)
RW Object Free Area Width	' (6 ' Actual)
RW Object Free Area Length Beyond RW End	' (' Actual)
RW Obstacle Free Zone Width	' (6 ' Actual)
RW Obstacle Free Zone Length	' (' Actual)
RW Protection Zone	RW : 'x 'x , ' RW 9: 'x 'x , '
Taxiway Design Group (TDG)	I
TW Width	' (' Actual)
TW Safety Area Width	9'
TW Object Free Area Width	89' (' Actual)
Taxilane Object Free Area Width	9' (6 ' Actual)

1.5.8 Airspace Surfaces

Title 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, includes several imaginary surfaces that are used as a guide to provide a safe and unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **Figure 1-7**. The primary, approach, transitional, horizontal and conical surfaces identified in Part 77 are applied to each runway at both existing and new airports based on the type of approach procedure available or planned for that runway and the specific Part 77 runway category criteria. A Memorandum of Understanding signed in November 2013 between Durango-Animas Airpark and CDOT Division of Aeronautics requires the Airpark to comply with Part 77 for all future airport development and anytime an existing airport development is altered in order to remain eligible for Discretionary Aviation Grants.

For the purpose of this section, a utility runway is a runway that is constructed for and intended for use by propeller driven aircraft of a maximum gross weight of 12,500 pounds or less. A visual runway is a runway intended for the operation using only visual approach procedures. A non-precision instrument runway is a runway with an approved or planned straight-in instrument approach procedure that has no existing or planned precision instrument approach procedure. A precision instrument runway is a runway with an active precision approach such as an Instrument Landing System (ILS).

Durango-Animas Airpark does not have any existing instrument approach procedures. The existing runway pavement strength is not published. It is assumed the pavement strength is less than 12,500 pounds Single Wheel Gear (SWG). The existing Part 77 surfaces are for a visual approach utility runway (>12,500 pounds) for both Runway ends 1 and 19. The Part 77 airspace surfaces for these classifications are described follows:

1.5.8.1 Primary Surface

The primary surface is an imaginary surface of specific width, longitudinally centered on a runway. The primary surface extends 200 feet beyond each end of the paved surface of runways, but does not extend past the end of unpaved runways. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width is 1,000 feet for precision runways, 250 feet for visual-utility runways and 500 feet for visual larger than utility runways and non-precision runways with visibility minimums greater than ¾-mile.

The existing primary surface width for Durango-Animas Airpark is 250 feet.

1.5.8.2 Approach Surface

The approach surface is 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 the runway based upon the type of approach available or planned for that runway, with approach gradients of 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 Part 77 runway classification criteria.

At Durango-Animas Airpark, these dimensions are 250 feet by 1,250 feet by 5,000 feet, with a 20:1 approach surface gradient for both Runway 1 and 19.

1.5.8.3 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, 150 feet above the airport.

1.5.8.4 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 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 air ort's useable runway, measured in feet above mean sea level. The perimeter is developed 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.

The existing horizontal surface arc at Durango-Animas Airpark is 5,000 feet.

1.5.8.5 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.

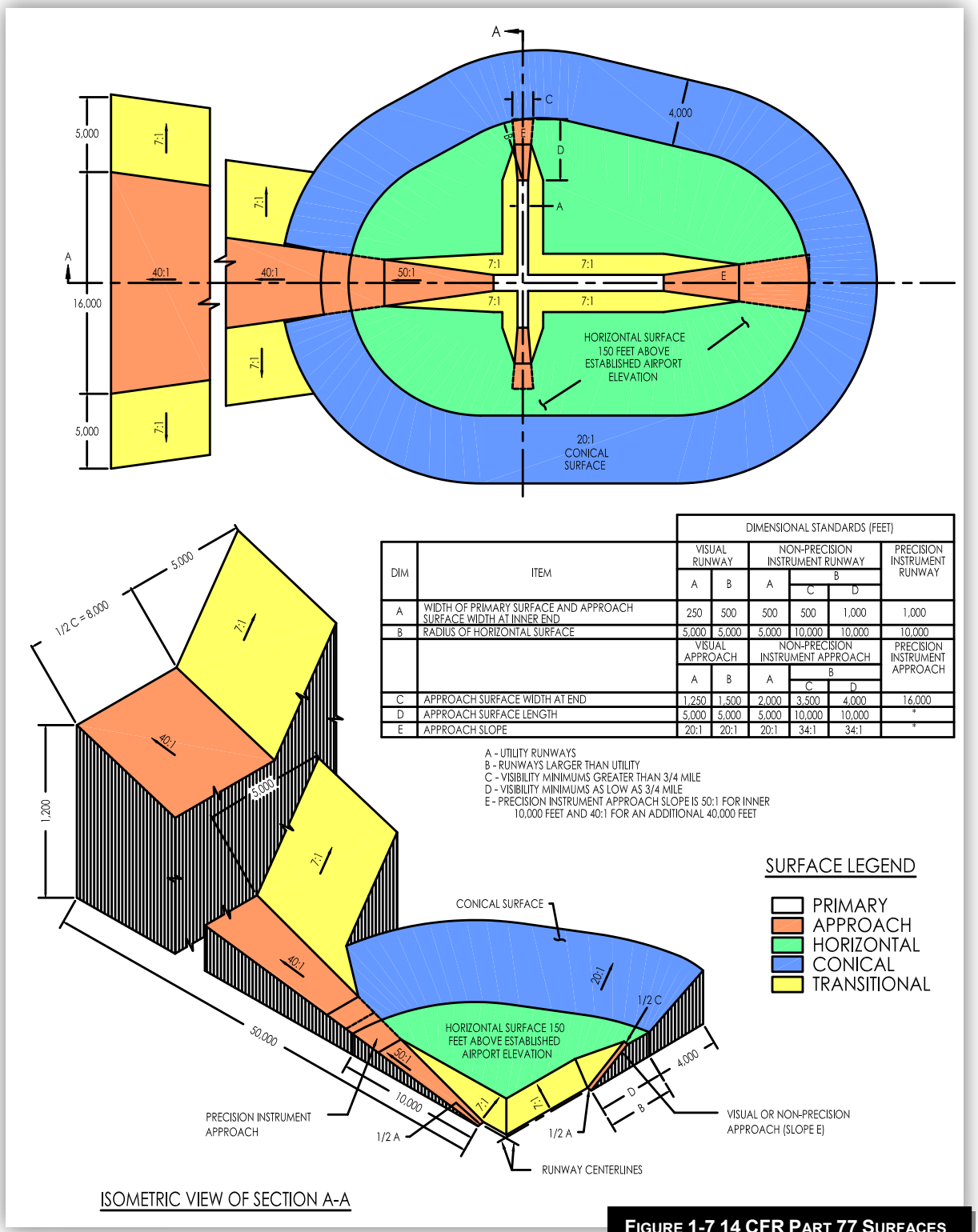
1.5.8.6 Summary of Dimensional Criteria

Table 1-7 summarizes the current Part 77 surfaces described above for Durango-Animas Airpark. A detailed list of Part 77 penetrations will be included as part of the Airport Layout Plan drawing set.

Table 1-7 Part 77 Surfaces

	Runway 1/19
Runway 1/19	Visual - Utility
Primary Surface Width	’
Primary Surface beyond RW end	’
Approach Surface dimensions	RW 1: 25 ’ x , 250’ x , ’ RW 19: 25 ’ x , 250’ x , ’
Approach Surface slope	RW 1: 20:1 RW 19: 20:1
Transitional Surface slope	7:1

Source: 14 CFR Part 77



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 1-7 14 CFR PART 77 SURFACES

1.5.9 Non-Standard Condition Inventory

Table 1-8 lists the existing airside features which do not meet the design standards listed in FAA AC 150/5300-13A, *Airport Design*.

Table 1-8 Non-Standard Conditions

Description	Standard	Actual	Reason for Condition
Runway 1/19			
Width	6 ’	’	Runway constructed to non-standard width
Runway Safety Area			
Width	’	’	Grade exceeding 1.5 to 5.0 percent limit
Length Beyond Runway End	’	’	Grade exceeding 1.5 to 5.0 percent limit
Runway Object Free Area			
Width	’	6 ’	Penetrated by trees
Length Beyond Runway End	’	’	Penetrated by road
Runway Obstacle Free Zone			
Width	’	6 ’	Penetrated by trees
Length Beyond Runway End	’	’	Penetrated by road
Runway Protection Zone			
RW 1	Free of Incompatible Land Use	Development within RPZ	RPZ Penetrated by Hangars
RW 19	Free of Incompatible Land Use	Development within RPZ	RPZ Penetrated by Road
Taxiway Object Free Area			
Width	89’	’	Penetrated by trees
Pavement Markings			
Runway Centerline to Aircraft Holding Position	’	8 ’	Holding position marked in non-standard location
Airfield Lighting and Visual Aids			
Rotating Beacon	Required if MIRLs are available	No rotating beacon on field	Rotating beacon not installed

1.6 Pavement Condition Index

The Pavement Condition Index (PCI) is a numerical index between 0 and 100 and is used to indicate the condition of the pavement. The PCI, as outlined by the Colorado Department of Trans ortation’s Aeronautics Division is based on a visual survey of the pavement and a numerical value between 0 and 100 defining the condition. Recommendations for the level of pavement maintenance required are based on the determined numerical value.

Figure 1-8 depicts the results of the 2013 PCI inspection report for the Durango-Animas Airpark. According to the inspection report, the aircraft parking apron area and taxiways are considered to be in poor condition, and the runway is considered to be in good condition. The specific ratings and recommended corrective actions are listed within **Table 1-9** for each pavement area.

Table 1-9 Pavement Condition Index

Feature	PCI	Recommended Action
Runway 1/19	100	Pavement Maintenance
Taxiway A	100	Pavement Maintenance
Aircraft Parking Apron (North)	49	Asphalt Overlay
Aircraft Parking Apron (South)	38	Asphalt Overlay

Source: State of Colorado, Department of Transportation – Aeronautics Division, 2014

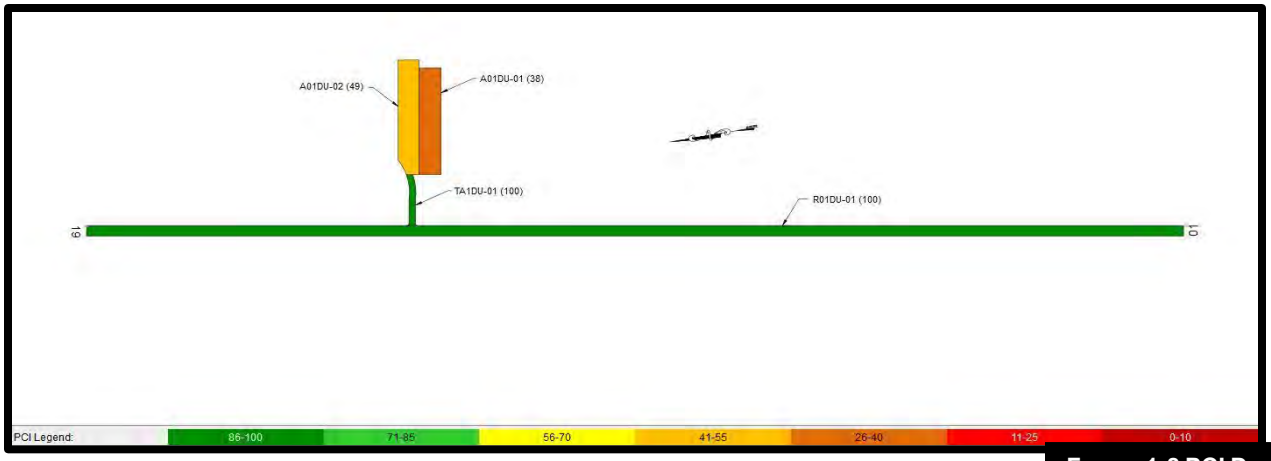


FIGURE 1-8 PCI DATA

1.7 Existing Landside Facilities

The landside facilities of an airport consist of those facilities that are not included as airside characteristics. Examples of such landside facilities include any structure adjoining the airfield, terminal buildings, hangars, the access routes to and from the airport, automobile parking areas, airport fencing, utilities, fuel provisions and snow removal and maintenance equipment. There are 54 parcels including aeronautical and non-aeronautical use located within the boundaries of Durango-Animas Airpark. The Durango-Animas Airpark existing landside facilities are shown in **Figure 1-9**, located at the end of this chapter.

1.7.1 Airport Services/Fixed Base Operator

A fixed base operator (FBO) is usually a private enterprise that provides 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 tie down and/or hangar storage. Gregg Flying Service currently provides FBO services at the airport including aircraft maintenance, flight training, fuel, aircraft parking, general aviation terminal, lounge and restrooms. The FBO building is approximately 4,800 square feet. The FBO is shown in **Figure 1-10**.

FIGURE 1-10 GREGG FLYING SERVICE

1.7.2 Hangars

The existing hangars at the Durango-Animas Airpark consist of a single unit T-Hangar and 18 conventional hangars. Several of these hangar units are combined with residential properties and are located at various locations throughout the Airpark property. Additionally, some of the hangars adjacent to Durango-Animas Airpark are utilized for non-aeronautical or industrial purposes. An example of the hangars at Durango-Animas Airpark is shown in **Figure 1-11**.

FIGURE 1-11 CONVENTIONAL HANGARS

1.7.3 Residential Properties

There are six residential properties located within the boundary of Durango-Animas Airpark including a single family home, three townhomes, a single family home with attached hangar and an apartment co-located with a hangar.

1.7.4 Industrial and Commercial Properties

There are 29 additional properties located within the boundaries of Durango-Animas Airpark which are owned for the purpose of industrial or commercial use. These facilities support a wide variety of businesses including but not limited to machinist shops, corporate offices, roofing contractors and crane operators. Three of these properties have direct access to Runway 1/19. An example of the commercial properties at Durango-Animas Airpark is shown in **Figure 1-12**.

1.7.5 Access Routes and Signage

The airport is conveniently accessed by taking Highway 550 approximately five miles south from downtown Durango to River Road, which turns into La Posta Road (State Highway 213). The airport is located on the west side of State Highway 213. Airpark Drive connects State Highway 213 to North Skyline Drive, which provides access to airport facilities. The airport and surrounding facilities are accessed by a single access point. There is currently no secondary access for use during emergency situations or to provide optimum vehicle circulation.

FIGURE 1-12 COMMERCIAL PROPERTIES

1.7.6 Ground Transportation

Gregg Flying Service coordinates ground transportation for itinerant operations upon request using local taxi cab, limousine, hotel shuttles or rental car services. There is currently no courtesy car available.

1.7.7 Automobile Parking

Automobile parking facilities are necessary for originating and terminating airport users, employees and visitors. It is important that vehicle parking is adequate to serve the needs of all airport users. Durango-Animas Airpark has unmarked public automobile parking to the north of Gregg Flying Service. There is also automobile parking adjacent to the privately owned hangars and businesses located at the Airpark.

1.7.8 Utilities

There is limited utility infrastructure to support Durango-Animas Airpark and the surrounding facilities. All facilities utilize wells for water and septic system in lieu of a direct sewer connection. According to the Airpark Property Owners Association, many of the wells dry up throughout the year leaving limited water for users. Electricity is provided by La Plata Electric Association, Incorporated. Telecommunication services are provided by CenturyLink. Heating services are provided through natural gas or propane. As of 2014, there are plans to install a water line which would serve Durango-Animas Airpark and adjacent properties.

1.7.9 Fencing

The primary purpose of airport fencing is to prevent inadvertent intrusions by persons and/or animals entering airport property. Airport fencing also provides an increased level of safety and security for the airport. Fencing is commonly installed along the perimeter of the airport property and outside of any safety areas or below all imaginary surfaces as defined by FAA AC 150/5300-13A, *Airport Design* and Title 14 Code of Federal Regulations Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*.

A portion of the airport boundary is surrounded by a four-strand barbed wire fence approximately four feet in height. According to Airpark tenants, the fence does not adequately mitigate wildlife from accessing airside facilities and numerous occasions have been reported where deer have been seen on Runway 1/19. There are no vehicle gates or fencing surrounding the aircraft parking apron. The fencing along Runway 1/19 is shown in **Figure 1-13**.

FIGURE 1-13 WILDLIFE FENCING

1.7.10 Fuel Facilities

Gregg Flying Service owns and operates one 10,000 gallon below ground fuel tank; 100 low lead AvGas. Additionally, there is one 660 gallon AvGas fuel delivery truck and one 1,400 gallon Jet-A fuel delivery truck operated by Gregg Flying Service. Spill Prevention, Control and Countermeasure (SPCC) and Stormwater Pollution Prevention (SWPP) Plans are maintained by the Gregg Flying Service.

1.7.11 Emergency Services

The nearest hospital is the Mercy Regional Medical Center, located five miles northeast of the Durango-Animas Airpark. Mercy Regional Medical Center has 82 patient beds and serves as a regional hospital for Southwest Colorado.

Aircraft fire and rescue services for Durango-Animas Airpark are provided by Durango Fire and Rescue. The district is a combined organization with three branches of participation, volunteer, reserve and paid. Durango Fire and Rescue has four stations which operate 24-hours a day and 13 volunteer stations. The nearest 24-hour a day station, Bodo Park Station, is located in Durango, approximately three miles north of Durango-Animas Airpark. The Durango Fire and Rescue Authority have over 180 personnel and 50 emergency response vehicles distributed amongst their stations. The estimated response time to the Durango-Animas Airpark is six

minutes. Depending on the required equipment, all stations are available to provide fire protection and response to the Durango-Animas Airpark.

1.8 Existing Airport Facilities Summary

Table 1-10 provides a summary of the existing airside and landside facilities located at the Durango-Animas Airpark.

Table 1-10 Existing Airport Facilities

Facility Information	
Facility Name	Animas Airpark
Location	Durango, Colorado
Identifier	00C
FAA Site Number	02586.24*A
ARC	B-I (Small)-VIS
Owner/Sponsor	Animas Airpark Property Owners Association
Airport Elevation	6,68 ' MSL
Runway and Taxiway Data	
	Runway 1/19
Runway Length and Width	, ' x '
Runway Pavement Type	Asphalt
Pavement Strength	Unknown (Assumed less than 12,500 lbs. SWG)
Runway Markings	Basic
Runway Lighting	MIRL (Non-standard)
Visual Aids	None
Approach Minimums	Visual
Taxiways	Connector
Taxiway Lighting	None
Aircraft Apron	11,237 sy.
Tie Downs	17
Navigational Aids	
Air Navigation Aids	None
Airport Beacon	None
Wind Indicator	Lighted
Segmented Circle	Yes
Unicom/Tower	122.8 MHz
Airport Building and Services	
T-Hangars / Hangars	1 Single-Unit T-Hangar and 18 Conventional Box Hangars
Automobile Parking	Unmarked
Perimeter Fencing	Partial
Fuel	100LL & Jet-A
Services	Fuel, Aircraft Maintenance, Flight Instruction and Pilot Lounge
Weather Equipment	None
FBO	Gregg Flying Service

1.9 Airport Service Area

An airport service area is defined by the communities and surrounding areas that are served by the airport facility. Generally, the airport service area includes the area within a thirty-minute drive or twenty-mile radius, of the airport. However, the actual service area is dependent upon several factors including the air o rt's surrounding to ogra hi c features, rox imity to its users, quality of ground access and the proximity of the facility to other airports that offer the same or similar services.

Aircraft operators will usually operate at the closest airport to their residence, place of business or destination that provides adequate facilities and services to accommodate their aircraft. In some cases, an airport user will choose to operate at a farther airport or facility with lesser services or features if that airport offers a cost advantage in terms of lower fees, rates and charges. To define the service area for the Durango-Animas Airpark, the airports in the vicinity and their facilities were reviewed. The service area includes a 30 minute drive time from the airport.

Figure 1-14 shows the air o rt's service area The Durango-La Plata County Airport falls within the Durango-Animas Airpark service area. **Table 1-11** provides information on the airports in the vicinity of the Durango-Animas Airpark.

Table 1-11 Animas Airpark and Nearby Airports With Instrument Approaches

Airport Name	ID	Distance (NM)	Distance (by Road in Miles)	Runway Lengths & Widths	Pavement Type	Inst. Approach	Fuel
Durango-Animas Airpark Durango, Colorado	00C	-	-	, ' x '	Asphalt	None	100LL Jet-A
Durango-La Plata County Airport Durango, Colorado	DRO	6	13	9, ' x '	Asphalt	ILS/GPS VOR	100LL Jet-A
Four Corners Regional Airport Farmington, New Mexico	FMN	33	50	6, ' x ' 6, ' x ,	Asphalt	ILS/GPS VOR	100LL Jet-A
Cortez Municipal Airport Cortez, Colorado	CEZ	37	55	, ' x '	Asphalt	GPS/VOR	100LL Jet-A
Stevens Field Airport Pagosa Springs, Colorado	PSO	39	57	8, ' x '	Asphalt	GPS	100LL Jet-A
Telluride Regional Airport Telluride, Colorado	TEX	45	115	, ' x '	Asphalt	GPS/VOR	100LL Jet-A

Source: Airnav.com, 2014
GA=General Aviation
P-CS= Primary Commercial Service
CS= Commercial Service

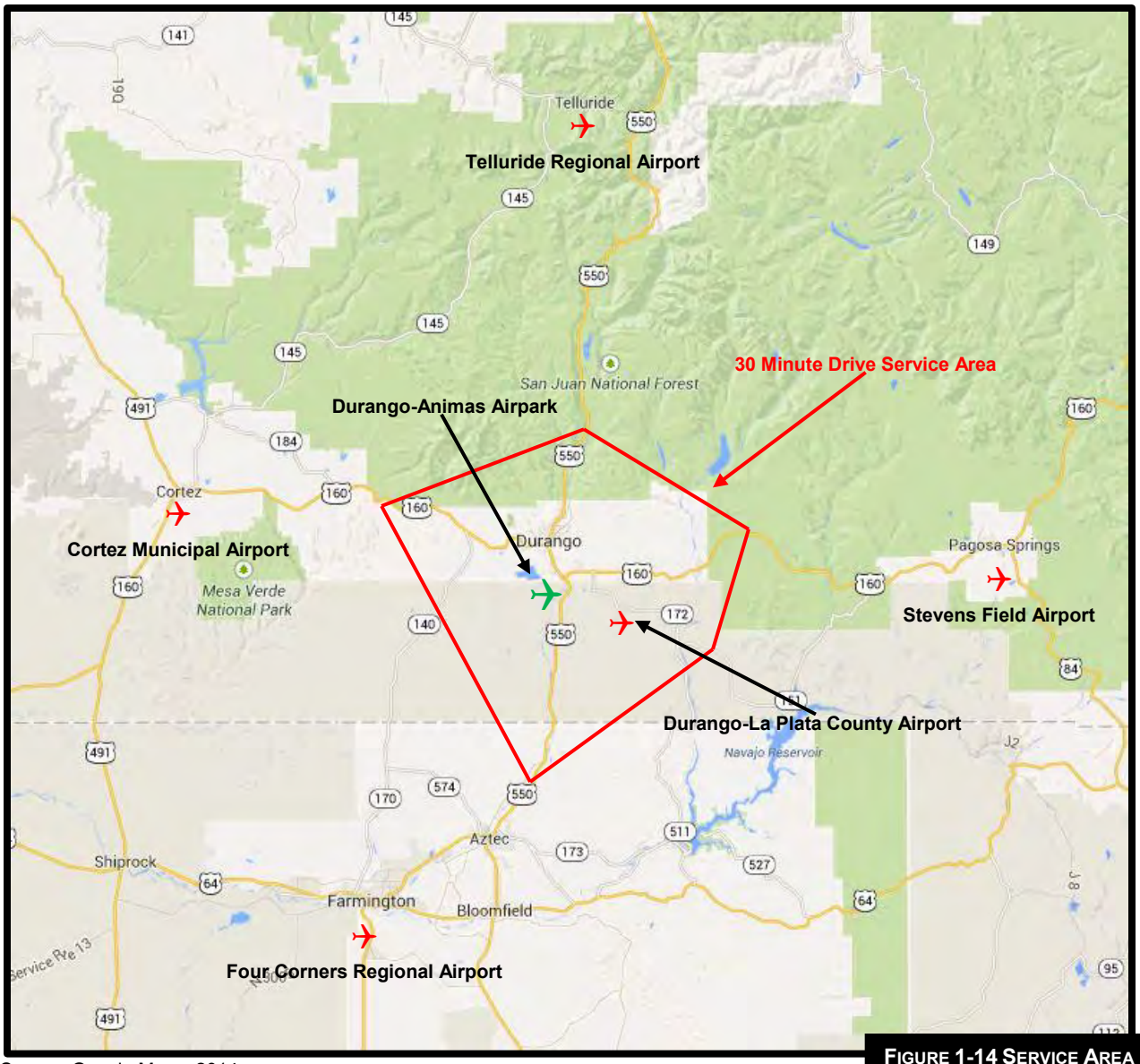


FIGURE 1-14 SERVICE AREA

Source: Google Maps, 2014
Note: Icons may not depict actual airport location

1.10 Airspace

1.10.1 National Airspace System

The National Airspace System consists of various classifications of airspace regulated by the FAA. Airspace classification is necessary to ensure the safety of all aircraft utilizing the facilities during periods of inclement weather, with the primary function of airspace classification being the separation of instrument flight rules (IFR) traffic from visual flight rules (VFR) traffic. Pilots flying in controlled airspace are subject to air traffic control requirements and must either follow VFR or IFR regulations. These regulations, which include combinations of operating rules, aircraft equipment and pilot certification, vary depending on the class of airspace and are described in 14 CFR Part 71 and shown in **Figure 1-15**.

FIGURE 1-15 AIRSPACE CLASSIFICATION

Figure 1-16 shows the airport to be located within Class G airspace, the least restrictive airspace. At 701 feet above the airport surface, Durango- a Plata County Air o rt's Class E airspace encroaches upon Durango-Animas Airpark, which requires pilots to comply with more restrictive weather requirements and certain air traffic control procedures for IFR operations.

Victor airways are low altitude flight paths between ground-based VORs. Due to Durango-Animas Air a rk's vicinity to the Durango VOR, there are three Victor Airways within a five mile radius. Victor Airway 211 (V211) runs east/west, Victor Airway 382 (V382) runs northwest only and Victor Airway 95-421 (V95-421) runs north/south. Traffic patterns at Durango-Animas Airpark is a standard left hand traffic for Runway 19 and right hand traffic for Runway 1. Durango-Animas Airpark traffic pattern altitudes are 1,000 feet above ground level (AGL) for all aircraft.

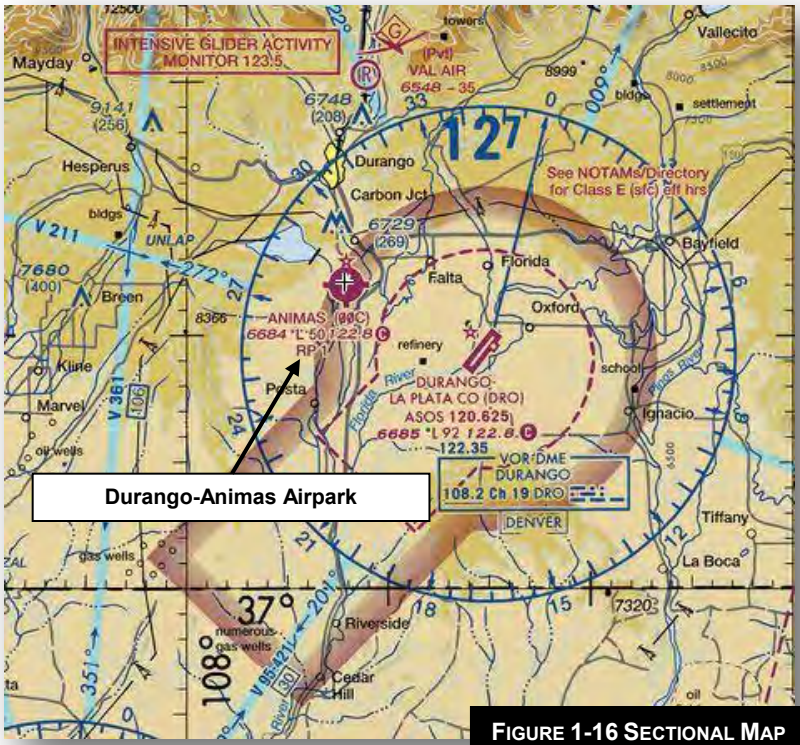


FIGURE 1-16 SECTIONAL MAP

1.10.2 Airspace Jurisdiction

As previously described, the Durango-Animas Airpark is located within the jurisdiction of the Denver ARTCC and the Denver FSS. The altitude of radar coverage by the Denver ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions and the surrounding terrain. The Denver FSS provides additional weather data and other pertinent information to pilots operating into or out of Durango-Animas Airpark.

1.10.3 Airspace Restrictions

Military Operation Areas (MOAs) and Military Training Routes (MTRs) are established for the purpose of separating certain military training activities, which routinely necessitate acrobatic or abrupt flight maneuvers, from IFR traffic. IFR traffic can be cleared through an active MOA if IFR separation can be provided by ATC, otherwise ATC will reroute or restrict IFR traffic. Durango-Animas Airpark is not located within close proximity of any MOAs or low level MTRs.

1.11 Socioeconomic Factors

Examining the specific socioeconomic characteristics of the City of Durango and La Plata County helps determine the factors influencing aviation activity in the area and determine the extent to which aviation facility developments are needed. Characteristics, such as population, employment and income will provide a foundation upon which to base the potential growth rate of aviation activity at the airport.

1.11.1 Local Profile

Durango-Animas Airpark is located alongside La Posta Road in La Plata County. The community lies in the center of the Animas Valley. The City of Durango is home to a wide variety of tourism activities such as whitewater rafting, hiking, the Durango and Silverton Narrow Gauge Railroad, fall foliage trips, musical performances and horseback riding. The City of Durango is located within proximity to several world class ski resorts.

1.11.2 Population

According to the most recent population count from the US Census Bureau, the City of Durango had a population of 16,885 in 2010. La Plata County had a population of 51,334 in 2010 according to the U.S. Census Bureau. The population of La Plata County increased at an average annual rate of 1.04 percent from 44,578 in 2000 to 51,334 in 2010. The U.S. Census also reports that the population for the State of Colorado increased from 4,301,261 in 2000 to 5,029,196 in 2010.

Population projections are shown in **Table 1-12** and **Figure 1-17**. The forecast developed by the Colorado Department of Local Affairs indicates a 3.2 percent average annual increase in population for La Plata County from 55,334 in 2014 to 91,396 in 2034.

Table 1-12 La Plata County Forecasted Population

Year	Projected Population
2014	55,334
2019	65,321
2024	74,379
2029	83,774
2034	91,396

Source: State of Colorado, Department of Local Affairs, 2014

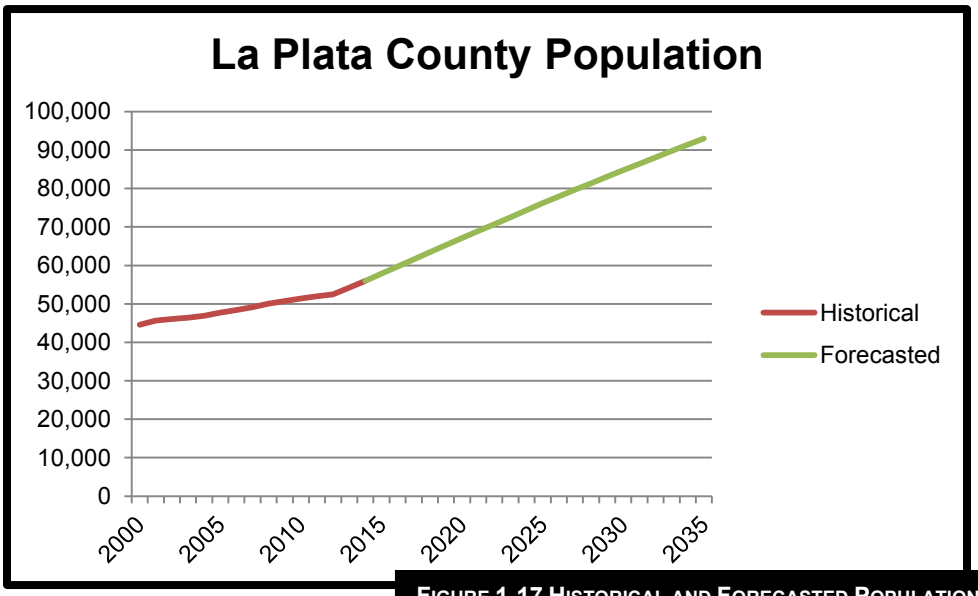


FIGURE 1-17 HISTORICAL AND FORECASTED POPULATION

1.11.3 Employment

According to the U.S. Department of Labor, the current (2014) unemployment rate in La Plata County is 5.2 percent which is below the national average of 6.3 percent. The largest employment sector in La Plata County is educational, health and social services, retail and tourism according to the Durango Chamber of Commerce. Employment distribution by industry for La Plata County is shown in **Table 1-13** and **Figure 1-18**. The largest employers for La Plata County are listed in **Table 1-14**.

Table 1-13 La Plata County Employment Distribution

Industry	Employment	Average Wage
Government	5,771	$56,506
Retail Trade	3,810	$26,149
Health Care and Social Assistance	3,557	$47,519
Construction	3,224	$52,337
Accommodation and Food Service	3,114	$16,972
Professional, Scientific and Technical	2,396	$59,016
Real Estate	2,234	$33,877
Finance and Insurance	1,885	$65,015
Administrative and Waste Management	1,549	$31,171
Other Services	1,515	$27,592
Total Employment	**36,834**	**$41,944**

Source: Durango Chamber of Commerce, 2014

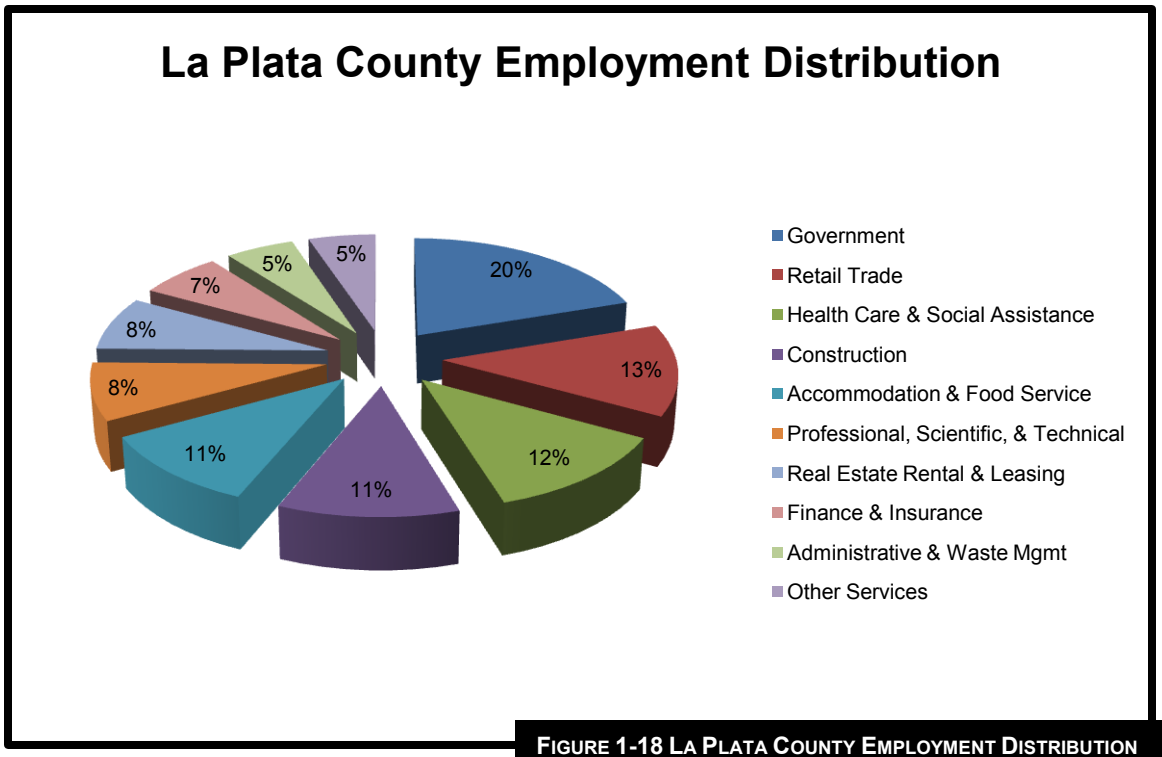


FIGURE 1-18 LA PLATA COUNTY EMPLOYMENT DISTRIBUTION

Table 1-14 Largest Employers – Durango, Colorado

Company	Industry	Employees
Mercy Regional Medical Center	Health Care	800
Southern Ute Indian Tribe-Growth Fund	Natural Resources	500
Mercury Pavement Systems	Technology	410
Wal-Mart	Retail	365
Crossfire Seeding	Natural Resources	250
BP America	Natural Resources	240
Rocky Mountain Chocolate Factory	Food and Beverage Manufacturing	175
Durango & Silverton Narrow Gauge Railroad	Tourism	170
Strater Hotel	Tourism/Lodging	140
GCC Energy	Natural Resources	135

Source: Durango Chamber of Commerce, 2014

1.11.4 Income

According to the U.S. Census Bureau, in 2012 the median household income in La Plata County was $57,407. The per capita income is $30,562 for La Plata County, with La Plata County being below the State of Colorado average of $31,039. The percentage of persons living below the poverty line in the City of Durango was 13.9 percent which is above the 11.1 percent average for La Plata County and the State of Colorado average of 12.9 percent.

1.12 Land Use Compatibility

CDOT recommends that airport sponsors protect the areas surrounding an airport from incompatible development and following FAA Advisory Circulars 150/5020-1, 150/5190-4A and Part 77. Incompatible development includes those land uses which would be sensitive to aircraft noise or over flight, such as residences, schools, churches and hospitals and those uses

which could attract wildlife and cause a hazard to aircraft operations such as certain agriculture crops, landfills, ponds and wastewater treatment facilities. The land in the vicinity of Durango-Animas Airpark has several different land uses including open space, industrial, commercial and some residential.

The boundaries of Durango-Animas Airpark are divided by several residential, commercial and industrial parcels. The airport is located within unincorporated La Plata County. The airport area is located in a designated Business/Industrial Park Overlay Zone per La Plata County Code of Ordinances Zoning Resolution Number 1995-19. The land uses surrounding the Durango-Animas Airpark are considered to be compatible with the airport. The land uses within the RPZs are not considered to be compatible with the airport.

1.13 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. Temperature combined with airport elevation also has an effect on aircraft performance capabilities and in turn required runway length.

1.13.1 Local Climatic Data

Durango-Animas Airpark is located in the southwestern portion of Colorado. The airport receives 18.98 inches of precipitation per year, with snowfall averaging 68.7 inches, as shown in **Figure 1-19**. Temperatures range from an average maximum temperature of 85.0 degrees Fahrenheit in July to an average minimum temperature of 10.4 degrees Fahrenheit in January, as shown in **Figure 1-20**.

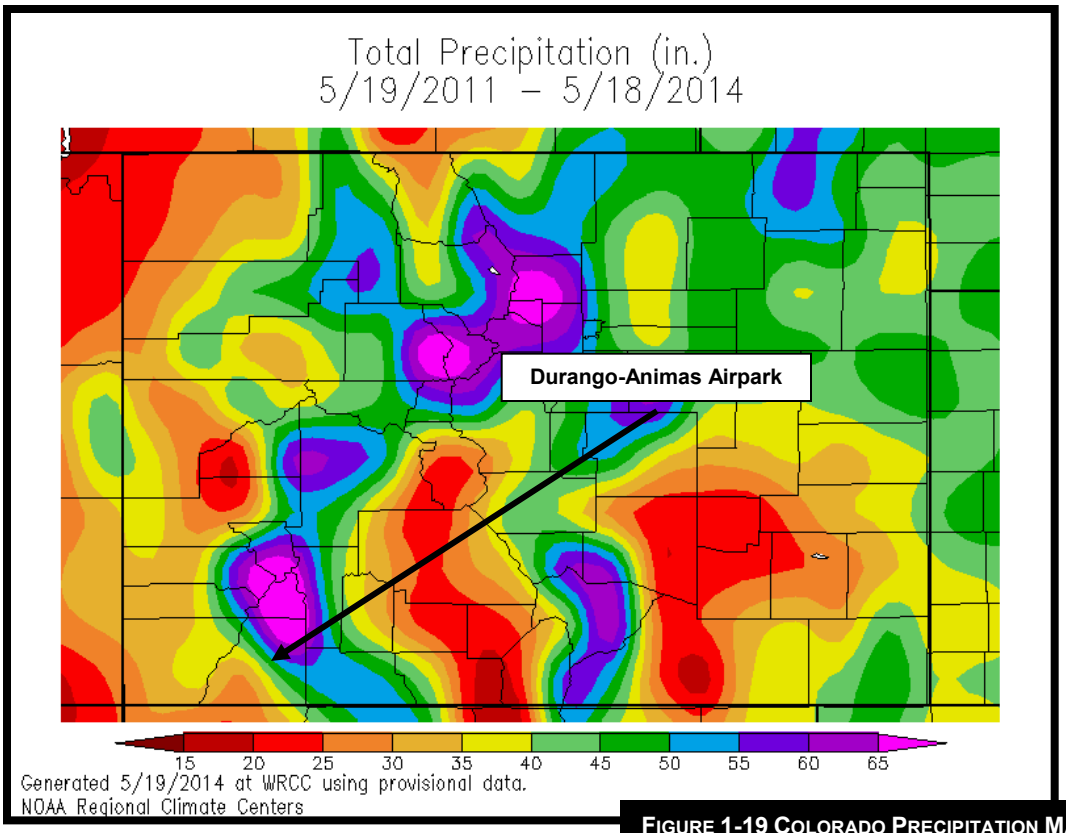


FIGURE 1-19 COLORADO PRECIPITATION MAP

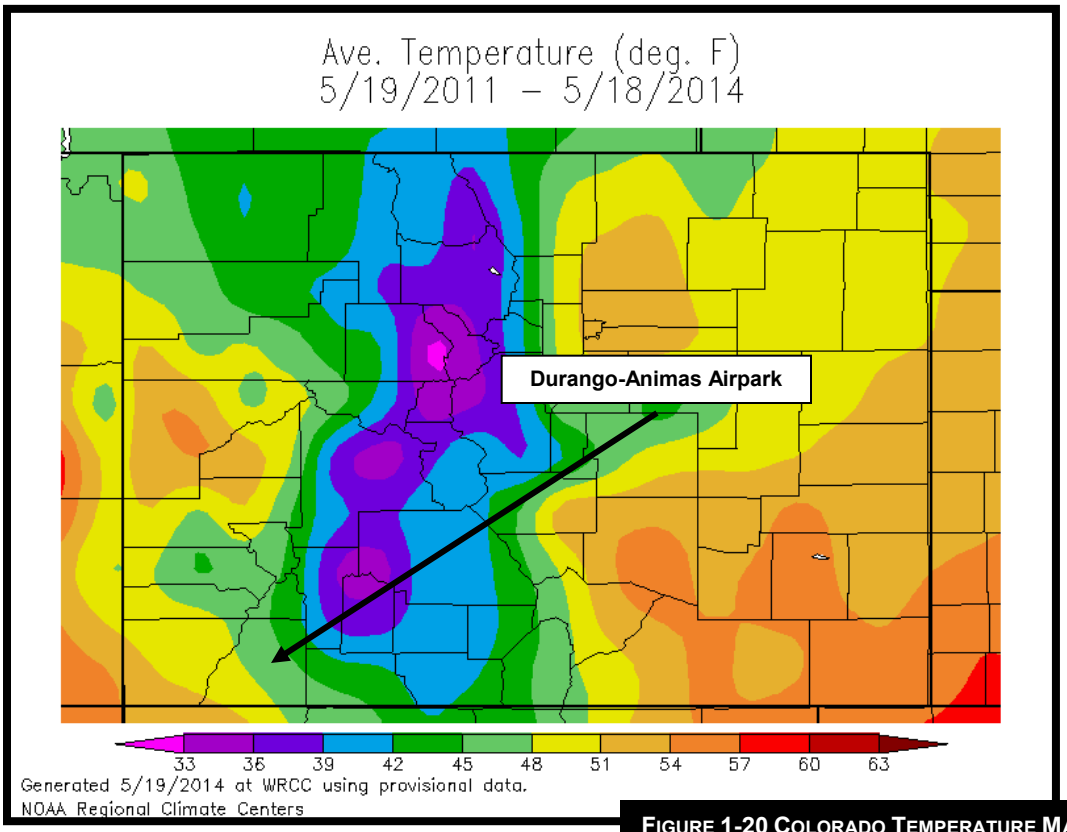


FIGURE 1-20 COLORADO TEMPERATURE MAP

1.13.2 Runway Wind Coverage

An analysis of wind speed and direction is essential in determining the optimum alignment and configuration of the runway system. It is beneficial to align runways as closely as practicable in the direction of the prevailing winds. Aircraft land and takeoff into the wind and, therefore, can only tolerate limited crosswind components (winds that blow perpendicular to the runway centerline). The maximum allowable crosswind depends on the aircraft size, design characteristics and pilot proficiency. **Table 1-15** shows allowable crosswind components for aircraft according to their Airport Reference Code.

Table 1-15 Allowable Crosswind Component

Crosswind (knots)	Airport Reference Code
10.5	A-I, B-I
13.0	A-II, B-II
16.0	A-III, B-III, C-I through D-III
20.0	A-IV through D-VI

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

FAA AC 150/5300-13A, *Airport Design*, recommends that a runway should be oriented so that it yields 95 percent wind coverage under stipulated crosswind coverage defined by the ARC. If a single runway alignment cannot meet the recommended 95 percent wind coverage then construction of an additional crosswind runway may be advisable.

There is no on-site weather station capable of recording hourly wind observations. The nearest weather data recording station is the Durango-La Plata County Airport ASOS located approximately six miles southeast of Durango-Animas Airpark. Due to variations in terrain and elevation, data from the Durango- a Plata County Air o rt's ASOS may not be com l etely accurate for determining prevailing wind trends for Durango-Animas Airpark. **Table 1-16** and **Table 1-17** lists the wind coverage for Durango-Animas Airpark in both all-weather and Instrument Meteorological Conditions (IMC) conditions using data obtained from Durango-La Plata County Airport.

Table 1-16 Durango-Animas Airpark Wind Data (All-Weather)

Crosswind (knots)	Percent of Coverage
10.5	91.84%
13.0	95.18%
16.0	98.01%

Source: Durango-La Plata County Airport ASOS, based on 99,916 observations from July 2006 to July 2014

Table 1-17 Durango-Animas Airpark Wind Data (IMC Conditions)

Crosswind (knots)	Percent of Coverage
10.5	91.92%
13.0	95.05%
16.0	97.65%

Source: Durango-La Plata County Airport ASOS, based on 99,916 observations from July 2006 to July 2014

The 10.5 knot windrose for all-weather and IMC conditions at Durango-Animas Airpark are shown in **Figure 1-21** and **Figure 1-22**, respectively.

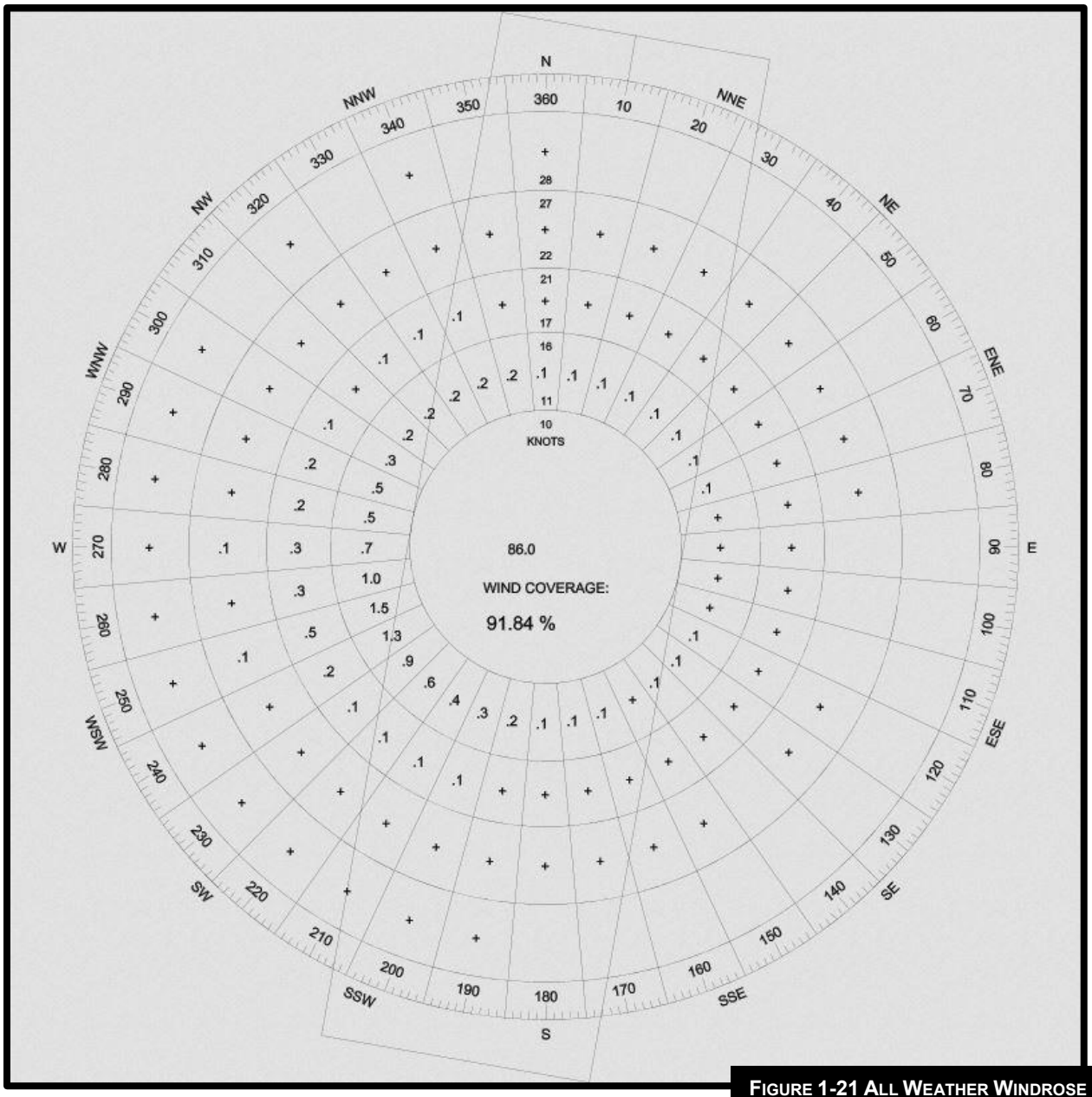


FIGURE 1-21 ALL WEATHER WINDROSE

Source: Durango-La Plata County Airport ASOS, based on 99,916 observations from July 2006 to July 2014

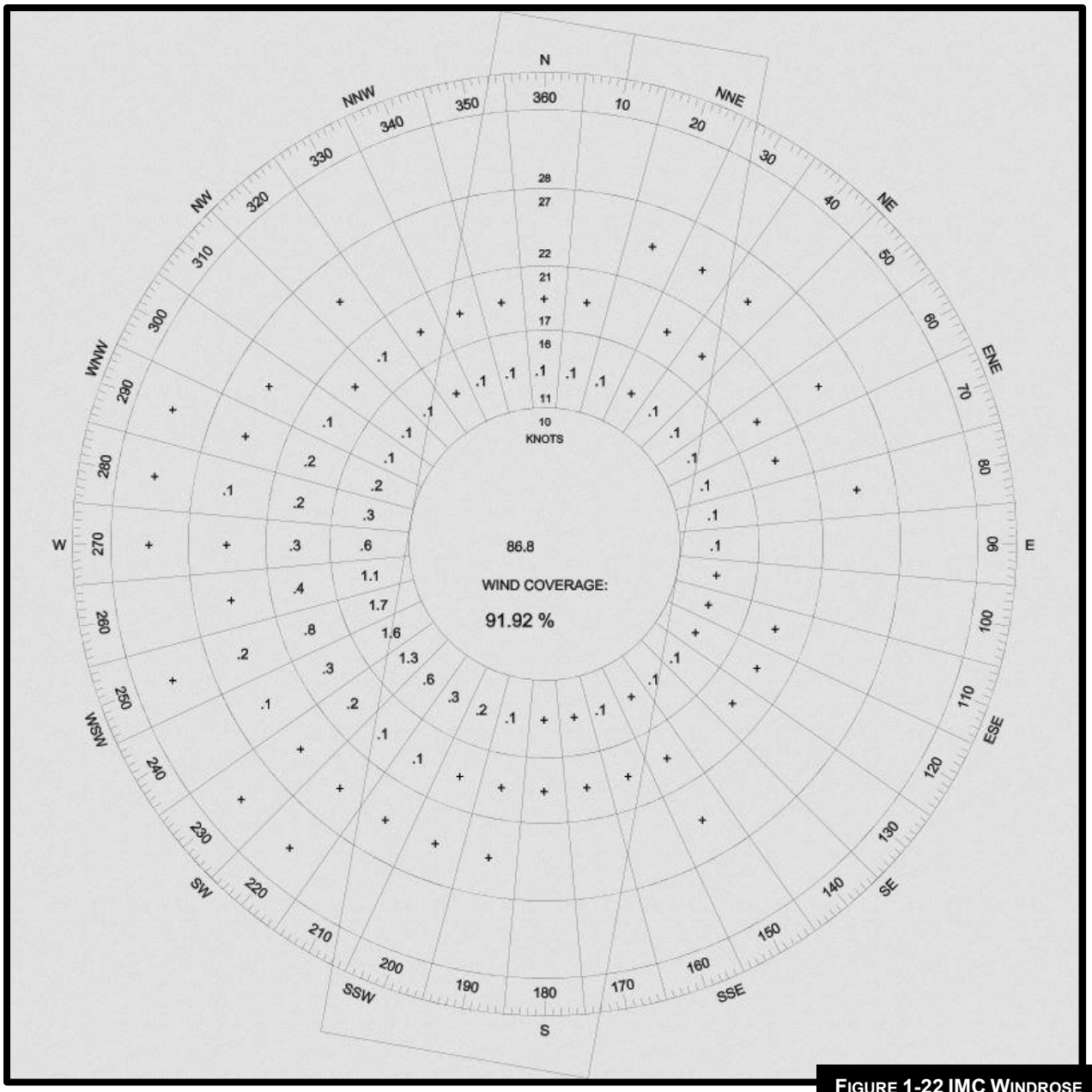


FIGURE 1-22 IMC WINDROSE

Source: Durango-La Plata County Airport ASOS, based on 99,916 observations from July 2006 to July 2014

1.14 Environmental Inventory

The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data contained in this section will be used throughout the planning process when evaluating potential airport development alternatives and identifying any potential environmental impacts and environmental related permits that may be required for recommended development projects.

1.14.1 Air Quality

Figure 1-23 contains an air quality map obtained from the Environmental Protection Agency (EPA) that identifies counties that are designated as Nonattainment for 1 or more National Ambient Air Quality Standards (NAAQS). La Plata County is within attainment for all criteria with NAAQS.

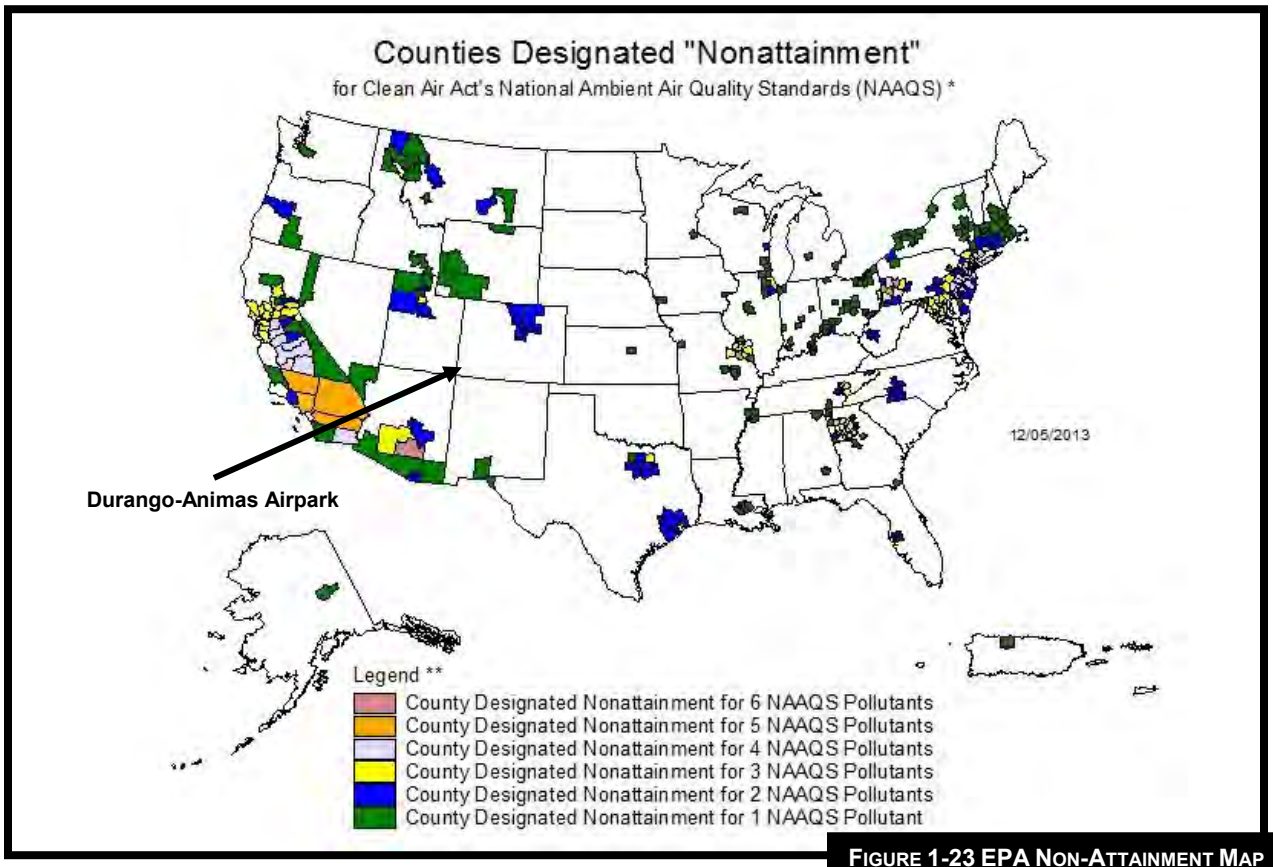


FIGURE 1-23 EPA NON-ATTAINMENT MAP

1.14.2 Department of Transportation Act, Section 4 (F)

There are no publicly owned public parks, recreation areas, wildlife and waterfowl refuges of National, State or Local significance or land from an historic site of National, State or Local significance located in the vicinity of the airport.

1.14.3 Floodplains

Executive Order 11988, Federal Floodplain Management, states that agencies must reduce the risk of flood loss, minimize the impacts of floods on human safety, health, and welfare, and restore and preserve natural and beneficial values served by floodplains. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) indicates the airport is not located within a floodplain as depicted in **Figure 1-24**. Historical data shows there have been no flooding events. Based on the site evaluation, no floodplains are known to occur at the airport.

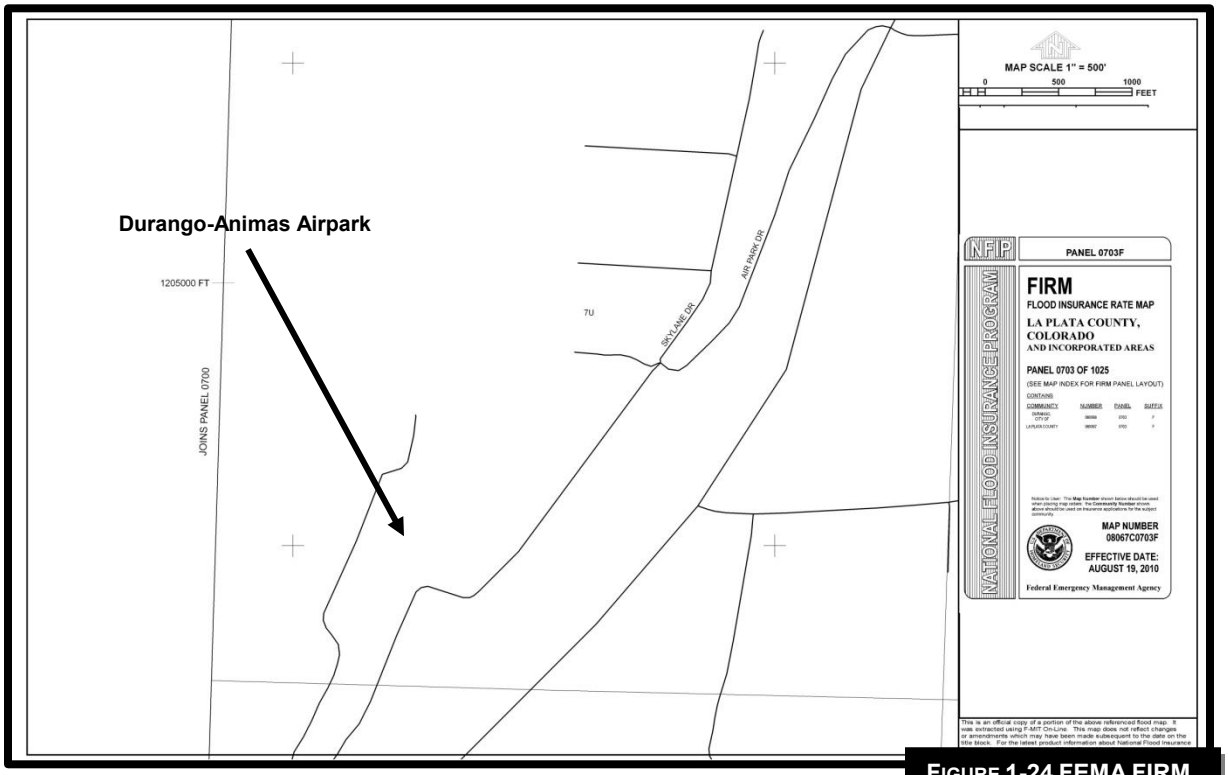


FIGURE 1-24 FEMA FIRM

1.14.4 Fish, Wildlife and Plants

The United States Fish and Wildlife Service May 2014 list of threatened and endangered species and candidate species that may occur within La Plata County was obtained and reviewed.

The following species are currently listed for La Plata County but do not necessarily occur in the vicinity of the Durango-Animas Airpark:

<u>Endangered</u>

- Bonytail chub, *Gila elegans*
- Colorado pikeminnow, *Ptychocheilus lucius*
- Knowlton's cactus, *Pediocactus knowltonii*
- Razorback sucker, *Xyrauchen texanus*
- Southwestern Willow flycatcher, *Empidonax traillii extimus*

- Uncompahgre Fritillary butterfly, *Boloria acrocnema*
- Humpback chub, *Gila cypha*

Proposed Endangered

- New Mexico meadow jumping mouse, *Zapus hudsonius luteus*

Threatened

- Canada Lynx, *Lynx Canadensis*
- Mexican Spotted owl, *Strix occidentialis lucida*

Proposed Threatened

- Yellow-billed Cuckoo, *Coccyzus Americanus*
- North American wolverine, *Gulo gulo luscus*

Candidate

- Schmoll milk-vetch, *Astragalus schmolliae*

1.14.5 Historical, Architectural, Archaeological and Cultural Resources

The Airpark boundary has the potential for archeological and cultural resources. According to the Air a rk Pro erty Owner's Association, several shards of historic o ttery have been discovered on parcels within the Airpark boundary.

CHAPTER TWO

FORECASTS OF AVIATION ACTIVITY

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER TWO
FORECASTS OF AVIATION ACTIVITY

2.0 Introduction

Forecasts of aviation activity provide the basis of evaluating the adequacy of existing airport facilities and its capability of handling potential traffic demand. Forecasts are the foundation for effective decision making in airport planning and establish the thresholds at which improvements are needed, the level of capital improvements and the timing of the necessary investments.

While forecast 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, forecasts must be used with careful consideration, as they may lose their validity with the passage of time or are impacted by unforeseen changes in the surrounding market.

General aviation forecasts are typically based on historical data and other broadly accepted industry and governmental estimates of aviation activity, as well as the primary socio-economic drivers of the local and regional areas.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the logical development of aviation facilities at Durango-Animas Airpark.

At airports not served by air traffic control towers, approximations of existing aviation activity are necessary in order to form a basis for the development of reliable forecasts. Unlike towered airports, non-towered general aviation airports have historically not tracked or maintained comprehensive logs of aircraft operations. Therefore, approximations of existing aviation activity are based upon reliable data such as a review of based aircraft, historical data, local information and regional, state and national data forming the baseline to which forecasted aviation activity trends are applied.

Forecast methodologies and analysis in this study consider historical aviation trends at Durango-Animas Airpark as well as throughout the nation. The latest local historical data was collected from the following sources: Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) dated May 2014; FAA Form 5010-1, *Airport Master Record*; 2012 Colorado Aviation System Plan Update (CASPU); and airport management records. Aviation activity projections are made based upon estimated growth rates, area demographics and socioeconomic indicators, industry trends and other relevant 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 periods. Using forecasts within this planning horizon will allow the airport's improvements to be timed in order to efficiently meet the expected demand.

2.1 Aircraft Operation Categories

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 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 from local practice areas and pleasure flights that originate and terminate at the airport under study.

Itinerant operations: departures that originate or terminate at another airport. These types of operations are closely tied to local demographic indicators, such as the use of aircraft by local businesses and use of the facility for recreational purposes. Itinerant operations may be conducted by based and transient aircraft.

Based aircraft operations: 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. If based at more than one airport, the airport at which the aircraft is stored at the most (example: the airport at which the aircraft is located at more than 6 months out of the year if operated out of two different airports).

Transient operations: 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 to correlate with FAA and State Aeronautics forecasting criteria.

2.2 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. 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 to Congress by the General Accounting Office (GAO), trends in general aviation since GARA was enacted suggest that liability costs have 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.

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 2013-2034 forecast predicts that the total general aviation fleet will increase at an average annual rate of 0.5 percent during the 21-year forecast period, growing from 202,865 aircraft in 2013 to 225,700 aircraft in 2033. The fleet of jet 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, it is expected to represent a smaller percentage of the total general aviation fleet. **Figures 2-1** and **2-2** illustrate this forecasted change to the general aviation fleet that is forecast to occur over the 21-year period.

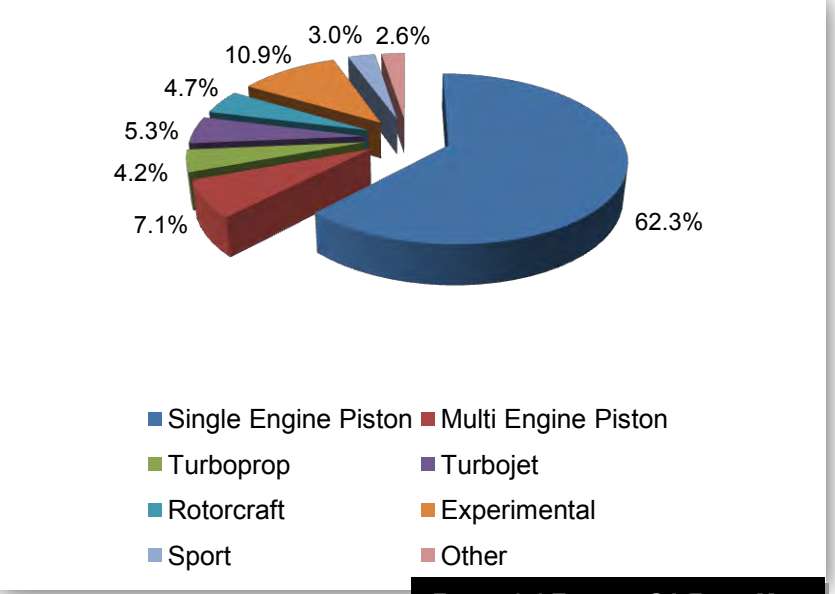


FIGURE 2-1 EXISTING GA FLEET MIX

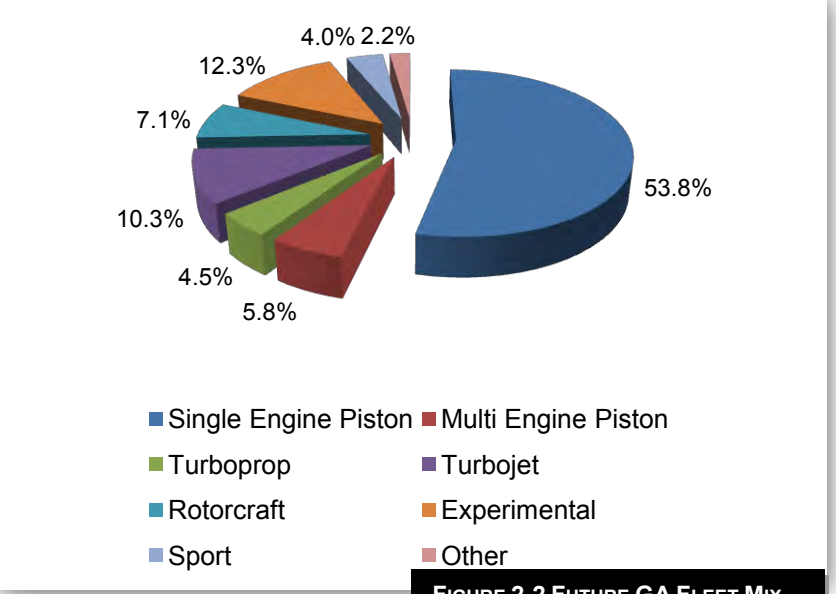


FIGURE 2-2 FUTURE GA FLEET MIX

Source: FAA

In 2005 the category of "light sport" aircraft was created. At the end of 2006 a total of 1,273 aircraft were included in this category. In 2011, the number of sport aircraft increased to 6,645. By 2033, a total of 10,245 light sport aircraft are projected to be in the fleet.

The General Aviation Manufacturer's Association (GAMA) produces activity forecasts based on general aviation hours flown. As shown in **Table 2-1**, the number of turbojet (TJ) hours flown is forecast to increase by an average annual growth rate of 12.5 percent from 2012 to 2032, while the number of multiengine (ME) hours flown is projected to decrease by 0.1 percent for a total increase of 15.4 percent.

Table 2-1 National General Aviation Forecast

	Hours Flown (in millions)			
Year	**SE**	**ME**	**TP**	**TJ**
2012	11.4	1.8	2.4	4.0
2013	11.1	1.8	2.5	4.3
2014	10.8	1.7	2.5	4.6
2015	10.6	1.7	2.6	4.9
2016	10.4	1.7	2.6	5.1
2017	10.3	1.7	2.6	5.3
2018	10.2	1.7	2.7	5.6
2019	10.2	1.7	2.7	5.8
2020	10.1	1.7	2.7	6.0
2021	10.1	1.7	2.7	6.3
2022	10.1	1.7	2.7	6.5
2023	10.2	1.7	2.8	6.8
2024	10.2	1.7	2.8	7.1
2025	10.4	1.7	2.8	7.4
2026	10.5	1.7	2.8	7.7
2027	10.7	1.7	2.8	8.0
2028	10.9	1.7	2.9	8.4
2029	11.0	1.7	2.9	8.8
2030	11.1	1.7	2.9	9.1
2031	11.3	1.7	2.9	9.6
2032	11.5	1.8	2.9	10.0
Avg. Annual Growth	**0.4%**	**-0.1%**	**2.6%**	**12.5%**

Source: GAMA, 2012

The number of active general aviation pilots (excluding air transport pilots) is projected to be 484,425 in 2034, an increase of 35,000 (up 0.4 percent annually) over the forecast period. Commercial pilots are projected to increase from 108,206 in 2013 to 122,000 in 2034, an average annual increase of 0.4 percent. The number of student pilots is forecast to decrease at an average annual rate of 0.2 percent over the forecast period, declining from 120,285 in 2013 to 116,050 in 2034. The number of private pilots is projected to grow at an average yearly rate of 0.1 percent over the forecast period from 180,214 in 2013 to a total of 182,450 in 2034.

The FAA is also projecting that by 2034, a total of 15,200 sport pilots will be certified. It is also projected that the estimated number of sport pilot certificates in 2013 was 4,824, reflecting a growing interest in this new "entry level" pilot certificate that was only created in 2005.

Next Generation Air Transportation System (NextGen) is a new era in flight that is transforming how aircraft navigate the sky. As a replacement to the World War II era technology that has until recently been the primary navigation technology, NextGen utilizes satellite technology which allows pilots to know the precise locations of other aircraft around them. This allows more planes in the sky while enhancing the safety of air travel. Satellite landing procedures also allow pilots arrive at airports more efficiently by providing for more direct flight routes.

Figure 2-3 highlights the amount of airports in the United States currently benefitting from NextGen.

FIGURE 2-3 NEXTGEN PRECISION

2.3 Existing Aviation Activity

According to Airpark records, there are 45 based aircraft. The based aircraft fleet mix is reported to be two multi-engine and 43 single-engine aircraft. The total number of annual aircraft operations from the FAA Form 5010-1 was reaffirmed by Airpark records. A summary of the existing activity is shown in **Table 2-2**.

Table 2-2 Existing Activity Levels

Year	Based Aircraft	GA Local	GA Itinerant	Air Taxi	Total
2014	45	7,118	3,670	162	10,950

Source: Airport Management, 2014

As discussed in Chapter 1, Durango-Animas Airpark serves a mix of single-engine piston, multi-engine, turboprop and helicopter aircraft. These users include business and recreational transport and flight training.

- Business and recreational transportation: These users desire the utility and flexibility offered by general aviation aircraft and are made up of business, recreational users, as well as tourism related activities. These operators make up most of the airports based aircraft and include a mix of single-engine, multi-engine and turbojet aircraft.

- Flight training: Currently, there is a Certificated Flight Instructor who conducts flight instruction utilizing Durango-Animas Airpark as a base of operations. These operations

primarily consist of local single engine piston aircraft operations and add to the airports local operations.

2.4 Available Activity Forecasts

The first step in preparing aviation forecasts is to examine historical and existing activity levels and available forecasts from other sources. The Colorado Aviation System Plan Update (CASPU) was reviewed. The 2012 CASPU forecasts 52 based aircraft in 2030 and an increase in annual operations for Durango-Animas Airpark totaling 9,850 by the year 2030. The FAA Terminal Area Forecast (TAF) for the State of Colorado was evaluated for growth in based aircraft. The FAA TAF for the State of Colorado shows 5,563 based aircraft by the year 2034.

FAA Form 5010-1, *Airport Master Record*, is the official record kept by the FAA to document airport physical conditions and other pertinent information. The record includes an annual estimate of aircraft activity as well as the number of based aircraft. This information is typically obtained from the airport sponsor or the FBO. The accuracy of this data for an airport the size of Durango-Animas Airpark is dependent upon the accuracy of the airport's record keeping system. The FAA Form 5010-1 dated December 2012 for Durango-Animas Airpark indicates a total of 45 based aircraft of which 44 are listed as single engine and one is listed as multi engine. The FAA Form 5010-1 also states there were 10,950 annual aircraft operations made up of 162 Air Taxi, 7,118 GA Local and 3,670 GA Itinerant operations.

2.5 Forecasts of Aviation Activity

2.5.1 Based Aircraft

Forecasts of based aircraft for Durango-Animas Airpark were developed from baseline data with growth rates of the community, county and state. A comparative analysis was generated of based aircraft forecasts using four different methodologies to arrive at a preferred forecast of based aircraft for Durango-Animas Airpark.

A per capita forecast that projects the number of based aircraft in direct proportion to the projected population for La Plata County was developed for Durango-Animas Airpark's forecast of aviation demand. According to the Colorado Department of Local Affairs, the population for La Plata County is expected to increase from 53,334 in 2014 to 91,396 in 2034. Using the per capita forecast method a total of 73 aircraft would likely be based at Durango-Animas Airpark by 2034. The results of the per capita forecast are shown in **Table 2-3**.

Table 2-3 Per Capita Forecast

Year	La Plata County Population	Based Aircraft
2014	55,334	45
2019	65,321	52
2024	74,379	59
2029	83,084	66
2034	91,396	73

A market share forecast was developed by comparing the 2014 FAA TAF for the State of Colorado to the current number of based aircraft at Durango-Animas Airpark. According to the 2014 FAA TAF there were 4,669 aircraft based in Colorado of which 45 were based at Durango-Animas Airpark. This results in the Airport having a 0.096 percent market share of Colorado based aircraft. The TAF for the State of Colorado forecasts the based aircraft to increase to 5,563 by 2034. By applying this growth to the based aircraft at Durango-Animas Airpark, there would likely be 54 based aircraft at the airport in 2034. The results of the market share are shown in **Table 2-4**.

Table 2-4 Market Share Forecast

Year	2014 FAA TAF – Colorado	Based Aircraft
2014	4,669	45
2019	4,885	47
2024	5,109	49
2029	5,329	51
2034	5,563	54

A forecast was developed utilizing the 2012 CASPU growth rate of one additional aircraft per five year period. This growth is shown in **Table 2-5** and results in there likely being 52 based aircraft at Durango-Animas Airpark by 2034.

Table 2-5 Colorado Aviation System Plan Update Forecast

Year	Based Aircraft
2014	45
2019	49
2024	50
2029	51
2034	52

A cohort forecast, which uses the per capita forecast combined with the market share forecast, was developed. The results of the cohort forecast are shown in **Table 2-6** and results in there likely being 60 based aircraft at the Airport in 2034.

Table 2-6 Cohort Method Forecast

Year	Based Aircraft
2014	45
2019	49
2024	53
2029	56
2034	60

As previously stated, airport forecasts are not an exact science. Forecasting numbers for a specific year, particularly beyond 10 years in the future is difficult, as there are many variables which can impact an airports based aircraft numbers. The aviation industry is volatile and susceptible to changes within the economy. **Table 2-7** and **Figure 2-4** shows the variation in based aircraft for each type of forecasting method.

Table 2-7 Forecast Method Comparison

Year	Per Capita	Market Share	CASPU	Cohort
2014	45	45	45	45
2019	52	47	49	49
2024	59	49	50	53
2029	66	51	51	56
2034	73	54	52	60

Based on the available forecasts, it is anticipated that the Durango-Animas Airpark based aircraft will trend to the Cohort Method forecast as it accounts for local population growth, an accurate representation of Airport goals and is considered reasonable for planning purposes. Therefore, this forecast method has been selected as the preferred forecast method.

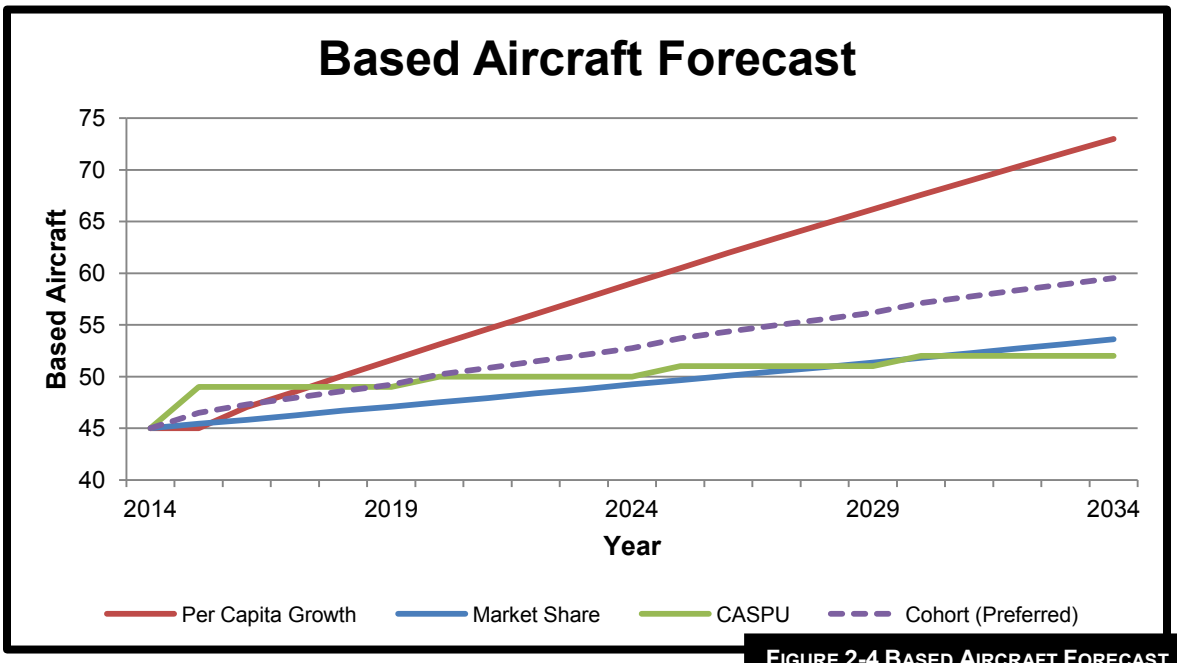


FIGURE 2-4 BASED AIRCRAFT FORECAST

2.5.2 Aircraft Operations

Forecasts of annual aircraft operations for Durango-Animas Airpark have been derived by applying the preferred based aircraft forecast of 60 based aircraft to the projected number of operations per based aircraft.

FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), states that the appropriate number of operations per based aircraft (OPBA) to use when estimating operations at a non-towered airport ranges from 250 to 450, with some very busy general aviation airports experiencing up to 750 operations per based aircraft. Currently, with 45 based aircraft and approximately 10,950 operations, the airport has an OPBA of 243 (note: this is not to imply that each based aircraft conducts 243 operations per year but that all aircraft utilizing the airport, including transient aircraft and touch-and-goes accumulate an average of 598 OPBA). By comparison, the 2012 CASPU forecasts respectively reports 190 OPBA.

In order to develop a preferred forecast of aircraft operations at Durango-Animas Airpark, three different methods were analyzed. Each method utilizes the preferred based aircraft forecast of 60 aircraft in 2034 and applies varying OPBA to the based aircraft forecast. These methods are summarized as follows:

Method 1: Existing operations per based aircraft (243 OPBA)

Method 2: FAA Order 5090.3C (350 OPBA)

Method 3: 2012 CASPU Plan (190 OPBA)

For the first method, the 2014 base year level of operations per based aircraft of 243 was applied to the preferred based aircraft forecast. Applying 243 to the preferred based aircraft forecast results in 14,580 annual operations in 2034 (243 x 60 = 14,580).

The second method, utilizes the general guideline contained in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) that recommends the use of 350 OPBA for busier non-towered general aviation airports. Applying 350 OPBA to the preferred based aircraft forecast results in 21,000 annual operations by 2034 (350 x 60 = 21,000).

The third method, applies the CASPU base year level forecast of an OPBA of 190 for Durango-Animas Airpark. Applying 190 OPBA to the preferred based aircraft forecast results in 11,400 annual operations in 2034 (190 x 60 = 11,400).

These estimates provide a likely range of activity for future operations at Durango-Animas Airpark. **Figure 2-5** graphs the results of each method. Based on an evaluation of operations forecast methods, the first method was selected as the preferred method as it reflects the shift towards an increase in operations with the increased availability of SASOs or other aviation-oriented enterprises.

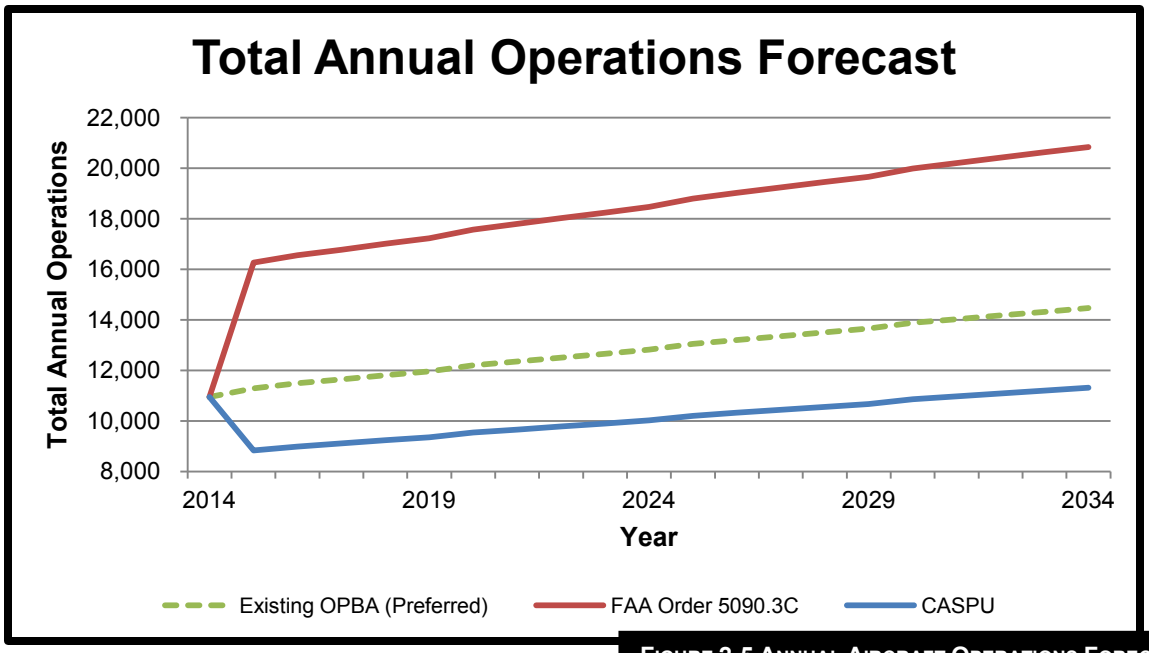


FIGURE 2-5 ANNUAL AIRCRAFT OPERATIONS FORECAST

2.6 Forecast Summary

The recommended forecast for Durango-Animas Airpark is summarized in **Table 2-8**. Activity estimates are currently 65 percent local, 34 percent itinerant and one percent air taxi. It is anticipated that this percentage of operations continues in 2034.

Table 2-8 Forecast Summary of Aviation Activity

Year	Based Aircraft	Local Operations	Itinerant Operations	Air Taxi Operations	Total Operations
2014	45	7,118	3,670	162	10,950
2019	49	7,697	4,048	162	11,907
2024	53	8,338	4,379	162	12,879
2029	56	8,819	4,627	162	13,608
2034	60	9,461	4,957	162	14,580

2.7 Aviation Activity Forecast by Aircraft Type

The preferred forecast by aircraft type is shown in **Table 2-9**. Local and itinerant operations are expected to be conducted by predominately single-engine aircraft operations with increasing activity by light twins and turboprops.

Table 2-9 Detailed Forecasts by Aircraft Type

	2014	2019	2024	2029	2034
Single Engine Aircraft (Standard)	43	47	49	51	53
Operations	7,665	8,335	9,015	9,526	10,206
Multi Engine Piston/Turbo-Prop Aircraft	2	2	2	3	4
Operations	1,643	1,786	1,932	2,041	2,187
Rotorcraft	0	0	1	1	2
Operations	1,095	1,191	1,288	1,361	1,458
Experimental & Other	0	0	1	1	1
Operations	548	595	644	680	729
Total Based Aircraft	**45**	**49**	**53**	**56**	**60**
Total Annual Operations	**10,950**	**11,907**	**12,879**	**13,608**	**14,580**

2.8 Airport Seasonal Use Determination

Some level of seasonal fluctuation in aircraft operations can be expected at nearly all airports. This fluctuation is most apparent in regions of the country with severe winter weather patterns or in resort communities where the local economy is driven by tourism. The fluctuation is less pronounced at major hub airports, with a high percentage of commercial and scheduled airline activity.

At non-towered general aviation airports, a way to determine any seasonal fluctuations is by reviewing annual fuel sales. A review of Durango-Animas Airpark fuel sales data for 2013 provides an accurate representation of the Airport's seasonal use trends, shown in **Figure 2-6.** The greatest quantity of fuel was sold from August to December with a yearly peak in October.

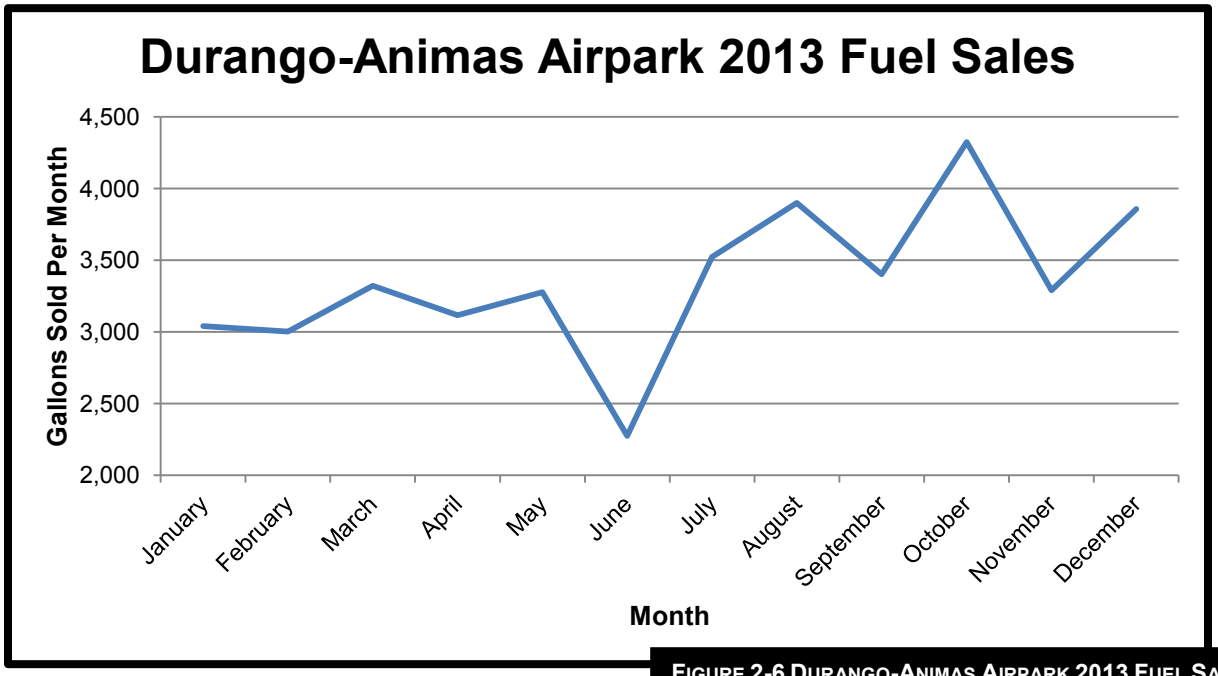


FIGURE 2-6 DURANGO-ANIMAS AIRPARK 2013 FUEL SALES

FIGURE 2-7 DURANGO-ANIMAS AIRPARK FUEL DELIVERY TRUCK

2.9 Hourly Demand and Peaking Tendencies

In order to arrive at a reasonable estimate of 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 to 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.

Gregg Flying Service recorded monthly fuel sales for 2013 which was used as a tool to determine the peaking characteristics for Durango-Animas Airpark. Using the operation records, 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

Approximately 90% of total daily operations occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, meaning 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, consequently, 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 2-10**. As is evident in **Table 2-10**, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of October (highlighted in bold), with an average of 51 daily operations and approximately five operations per hour in 2034.

Table 2-10 Estimated Monthly/Daily/Hourly Demand

Planning Year: 2019					Planning Year: 2024				
Operations:	11,907				Operations:	12,879			
		Operations					Operations		
Month	**% Use**	**Monthly**	**Daily**	**Hourly**	**Month**	**% Use**	**Monthly**	**Daily**	**Hourly**
January	7.54%	898	30	3	January	7.54%	971	32	4
February	7.44%	886	29	3	February	7.44%	959	32	4
March	8.24%	981	32	4	March	8.24%	1,061	35	4
April	7.73%	920	30	3	April	7.73%	995	33	4
May	8.13%	968	32	4	May	8.13%	1,047	34	4
June	5.64%	672	22	2	June	5.64%	727	24	3
July	8.73%	1,040	34	4	July	8.73%	1,125	37	4
August	9.67%	1,151	38	4	August	9.67%	1,245	41	5
September	8.44%	1,005	33	4	September	8.44%	1,087	36	4
October	**10.72%**	**1,276**	**42**	**5**	**October**	**10.72%**	**1,380**	**45**	**5**
November	8.16%	972	32	4	November	8.16%	1,051	35	4
December	9.56%	1,139	37	4	December	9.56%	1,232	40	5

Planning Year: 2029					Planning Year: 2034				
Operations:	13,608				Operations:	14,580			
		Operations					Operations		
Month	**% Use**	**Monthly**	**Daily**	**Hourly**	**Month**	**% Use**	**Monthly**	**Daily**	**Hourly**
January	7.54%	1,026	34	4	January	7.54%	1,099	36	4
February	7.44%	1,013	33	4	February	7.44%	1,085	36	4
March	8.24%	1,121	37	4	March	8.24%	1,201	39	4
April	7.73%	1,052	35	4	April	7.73%	1,127	37	4
May	8.13%	1,106	36	4	May	8.13%	1,185	39	4
June	5.64%	768	25	3	June	5.64%	823	27	3
July	8.73%	1,188	39	4	July	8.73%	1,273	42	5
August	9.67%	1,316	43	5	August	9.67%	1,409	46	5
September	8.44%	1,148	38	4	September	8.44%	1,230	40	5
October	**10.72%**	**1,459**	**48**	**5**	**October**	**10.72%**	**1,563**	**51**	**6**
November	8.16%	1,110	37	4	November	8.16%	1,190	39	4
December	9.56%	1,301	43	5	December	9.56%	1,394	46	5

2.10 Peak Hour GA Pilot and Passenger Flows

The number of pilots and general aviation passengers relates to the peak hour operations forecast in **Table 2-10**. Based upon a historical economic impact studies; an average of 3.44 persons per aircraft operation at general aviation airports. Using the average of 3.44 passengers per peak hour operation, results in a peak hour flow of 28 general aviation pilots/passengers by 2034. **Table 2-11** depicts the peak hour general aviation pilot and passenger flows that are expected during the planning period.

Table 2-11 General Aviation Pilot and Passenger Flow

Year	Peak Hour Aircraft Operations	Peak Hour GA Pilot/Passenger Flow
2019	5	17
2024	5	17
2029	5	17
2034	6	21

2.11 Forecast Summary

Forecasts of activity were developed for based aircraft, operations and the ultimate fleet mix at the airport. These forecasts represent low, medium and high expected activity trends. **Table 2-12** shows a summary of the preferred forecast for Durango-Animas Airpark through the 20 year planning period, while utilizing the most current based aircraft data for the baseline year.

Table 2-12 Detailed Forecast Summary

Year	Based Aircraft	Passenger and Pilots Peak Hourly Flow	Itinerant Operations			Local Operations			Total Operations
			GA	Air Taxi	Total	GA	Air Taxi	Total	
2019	49	17	4,048	162	4,210	7,697	0	7,697	11,907
2024	53	17	4,379	162	4,541	8,338	0	8,338	12,879
2029	56	17	4,627	162	4,789	8,819	0	8,819	13,608
2034	60	21	4,957	162	5,119	9,461	0	9,461	14,580

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CHAPTER THREE

FACILITY REQUIREMENTS

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER THREE
FACILITY REQUIREMENTS

3.0 Introduction

One of the primary objectives of this planning study is to determine the size and configuration of facilities needed to accommodate the types and volume of aircraft expected to utilize the Airpark. Data from Chapter One - Inventory and Chapter Two – Forecasts of Aviation Activity are coupled with established planning criteria to determine the improvements that are necessary for airside and landside areas. Having established the facility requirements, alternatives for providing these facilities are provided in Chapter Four – Development Alternatives to determine the viability of meeting the facility needs.

The time frame for addressing development needs usually involves short-term (up to five years), medium-term (six to ten years) and long-term (eleven to twenty year) periods. Long range planning primarily focuses on the ultimate role of the Airpark and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items.

3.1 Runway Design Code

The Runway Design Code (RDC) is a system established by the FAA to relate airport design criteria to the operational and physical characteristics of the aircraft that are currently operating and/or forecast to operate at the Airpark. The RDC has three primary components relating to airport design. The first component, depicted by letters A through E, is categorized by the design aircraft approach speed, which determines the runway approach category (operational characteristic). The second component, depicted by Roman numerals I through VI, is categorized by either the design aircraft wingspan or tail height, utilizing the characteristic that places the aircraft in the highest design group (physical characteristic). The third component relates to the visibility minimums. Expressed by Runway Visual Range (RVR), the values are listed in feet of 1,200, 1,600, 2,400, 4,000 and 5,000. If the airport does not have an instrument approach it is listed as VIS. In general, the approach category of the design aircraft will determine the required design parameters for runway and runway facilities while the aircraft wingspan or tail height will determine the required taxiway and taxilane separation criteria. **Tables 3-1** through **3-3** have been included to provide a definition of both aircraft approach categories, aircraft design groups and visibility minimums. Examples of aircraft in each of these RDCs are depicted in **Figure 3-1**.

Table 3-1 Aircraft Approach Category (AAC)

Aircraft Approach Category	Approach Speed
A	<91 knots
B	>91 knots but <121 knots
C	>121 knots but <141 knots
D	>141 knots but <166 knots
E	166 knots or greater

Table 3-2 Airplane Design Group (ADG)

Group #	Wingspan (ft.)	Tail Height (ft.)
I	< 49'	< 20'
II	49' - < 79'	20' - < 30'
III	79' - < 118'	30' - < 45'
IV	118' - < 171'	45' - < 60'
V	171' - < 214'	60' - < 66'
VI	214' - < 262'	66' - < 80'

Table 3-3 Visibility Minimums

RVR (ft.)	Flight Visibility Category (statue mile)
5,000	Not lower than 1 mile (APV > 1 mile)
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 34 but < 1 mile)
2,400	Lower than 3/4 mile but not lower than 1/2 (CAT - I PA)
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)
1,200	Lower than 1/4 mile (CAT - III PA)

A-I*	Primarily single-engine piston aircraft, some light multi-engine aircraft	Cessna 172	Diamond DA40
B-I*	Primarily light multi-engine piston aircraft, some very light jets	Cessna 402C	Cessna Citation Mustang
B-II*	Light turboprops, small commuter airliners, and mid-sized corporate jets	Beechcraft 1900	Pilatus PC-12
C/D-I	Primarily small and fast corporate jets	Learjet 45	Learjet 60
C/D-II	Large corporate jets and small regional jets (≥ 50 seats)	Bombardier CRJ-200	Gulfstream IV
C/D-III	Large regional airliner jets and small commercial airliners (approx. 76-200 seats)	Bombardier CRJ-900	Boeing 737
C/D-IV	Medium to large commercial airliners (approx. 200-350 seats)	Airbus A330	Boeing 767
D-V or greater	Very large commercial airliners (approx. 350+ seats)	Airbus A380	Boeing 747

*If aircraft MTOW is less than 12,500 lbs., it is considered "small."

FIGURE 3-1 RUNWAY DESIGN CODES

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific RDC for the runway must be determined. In order to designate a specific RDC for a runway, aircraft in that RDC should perform a minimum of 500 annual operations. The existing RDC at Durango-Animas Airpark is B-I (small). The aircraft currently using Durango-Animas Airpark on a regular basis have a RDC of A-I, B-I and B-II. The majority of the turboprop aircraft and very light jet aircraft fall into the B-I and B-II RDC. Airpark users and fleet mix were discussed in Chapter Two – Forecasts of Aviation Activity. Examples of aircraft with an RDC of A-I and B-I are listed in **Table 3-4**. Examples of aircraft with an RDC of A-II and B-II are listed in **Table 3-5**. Aircraft with a RDC of A-I through B-II are expected to utilize the Airpark in the short, medium and long-term time frames. Aircraft with a RDC of greater than B-II are expected to continue to occasionally operate at the airport.

The future design aircraft will be the Cessna 402C which has a RDC of B-I (small). The Cessna 402C was selected as the design aircraft as it is a common general aviation aircraft which uses Durango-Animas Airpark and is expected to increase utilization during the 20-year planning period. The Cessna 402C is shown in **Figure 3-2**.

FIGURE 3-2 CESSNA 402C

Source: avmin.com.au, 2014

Table 3-4 Example Aircraft Having a RDC of A-I or B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	9.1	6,200
Beech Bonanza V35B	70	33.5	6.6	3,400
Beech King Air B100	111	45.9	15.3	11,799
Cessna 150	55	33.3	8.0	1,670
Cessna 172	60	36.0	9.8	2,200
Cessna 177	64	35.5	8.5	2,500
Cessna 182	64	36.0	9.2	2,950
Cessna 340	92	38.1	12.2	5,990
Cessna 402C	92	44.2	11.6	6,850
Cessna 414	94	44.1	11.5	6,750
Cessna Citation I	108	47.1	14.3	11,850
Eclipse 500 Jet	90	37.9	13.5	5,920
Gates Learjet 28/29	120	42.2	12.3	15,000
Mitsubishi MU-2	119	39.1	13.8	10,800
Piper Archer II	86	35.0	7.4	2,500
Piper Cheyenne	110	47.6	17.0	12,050
Piper Meridian	95	43.0	11.3	5,092
Raytheon Beechjet	105	43.5	13.9	16,100
Rockwell Sabre 40	120	44.4	16.0	18,650
Swearingen Merlin	105	46.3	16.7	12,500

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

Table 3-5 Example Aircraft Having a RDC of A-II or B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90-1	100	50.3	14.2	9,650
Beech Super King Air B200	103	54.5	14.1	12,500
Cessna 441	100	49.3	13.1	9,925
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Cessna Citation Bravo	112	52.2	15.0	14,800
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Grumman Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920

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

3.2 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.

3.2.1 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 one year. 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 AC 150/5060-5, *Airport Capacity and Delay*.

FAA AC 150/5060-5, *Airport Capacity and Delay*, was used to calculate the ASV for a single-runway airport with the forecasted operation levels determined in Chapter Two – Forecasts of Aviation Activity. Annual Service Volume for the runway configuration is 230,000 operations per year. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study. The forecasted ASVs for Durango-Animas Airpark are listed in **Table 3-6.**

Table 3-6 Annual Service Volume Summary

Year	Annual Operations	Annual Service Volume	Annual Capacity Ratio
2014	10,950	230,000	4.76%
2019	11,907	230,000	5.18%
2024	12,879	230,000	5.60%
2029	13,608	230,000	5.92%
2034	14,580	230,000	6.34%

Source: Armstrong Consultants, Inc, 2014

Runway Length: AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length requirements. The AC provides recommended runway lengths and other facilities on an airport according to FAA design standards. The information required to determine the recommended runway lengths includes, airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. The following information for Durango-Animas Airpark was used for the analysis:

Field Elevation: 6,688 feet MSL (Surveyed)
Mean Maximum Temperature of Hottest Month: 85.0^{o} F
Effective Gradient: 55.0 Feet (Surveyed)

The process to determine recommended runway lengths for a selected list of critical design airplanes begins with determining the weights of the critical aircraft that are expected to use the Airpark on a regular basis. For aircraft weighing 60,000 pounds or less, the runway length is determined by family groupings of aircraft having similar performance characteristics. The first family grouping is identified as small airplanes, which is defined by the FAA as airplanes

weighing 12,500 pounds or less at Maximum Takeoff Weight (MTOW). The second family grouping is identified as large airplanes, which is defined by the FAA as airplanes exceeding 12,500 pounds but weigh less than 60,000 pounds. Aircraft weighing more than 60,000 pounds are classified as an individual large airplane. The required runway length is determined by aircraft-specific length requirements. **Table 3-7** shows the aircraft families determined by the FAA.

Table 3-7 Airplane Weight Categorization for Runway Length Requirements

Airplane Weight Category Maximum MTOW			Design Approach
≤ 12,500 Pounds	Approach Speed < 30 knots		Family groupings of small airplanes
	Approach Speed ≥ 30 knots, but < 50 knots		Family groupings of small airplanes
	Approach Speed ≥ 50 knots	With < 10 Passengers	Family groupings of small airplanes
		With ≥ 10 Passengers	Family grouping of small airplanes
Over 12,500 pounds, but < 60,000 pounds			Family groupings of large airplanes
≥ 60,000 pounds or more, or Regional Jets[1]			Individual large airplane
Note[1]: All regional jets, regardless of their MTOW, are assigned to the 60,000 pounds or more weight category.			

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Recommended runway lengths are determined using charts in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the Airpark. The small airplanes with the approach speed of greater than or equal to 50 knots with less than 10 passengers seats and a Maximum Takeoff Weight (MTOW) less than 12,500 pounds recommends a runway length of 8,070 feet in order to accommodate 95 percent of the fleet; 95 percent of fleet category applies to airports that are primarily intended to serve medium size population communities with a diversity of usage and greater potential for increased aviation activities. Also included in this category are those airports that are primarily intended to serve low-activity locations, small population communities and remote recreational areas. The approach speed of greater than or equal to 50 knots with less than 10 passenger seats and a MTOW less than 12,500 pounds recommends a runway length of 8,070 feet in order to accommodate 100 percent of the aircraft fleet. 100 percent of fleet category is a type of airport that is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area. The current length of Runway 1/19, 5,010 feet, accommodates approximately 70 percent of the small airplanes.

Recommended runway lengths to serve large aircraft weighing over 12,500 pounds, but less than 60,000 pounds are determined using a certain percentage of the useful load. The term useful load, as defined by the FAA, is the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil and unusable fuel. According to the AC, 75 percent of fleet at 60 and 90 percent useful load requires runway lengths of 7,640 feet and 8,900 feet respectively. The AC shows 100 percent of the fleet at 60 and 90 percent useful

load requires a runway length of 11,550 feet. **Table 3-8** provides the recommended runway length information.

Table 3-8 Recommended Runway Length

Description	Runway Length
Existing Runway Length	5,010’
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.,< 10 passenger)	
75 percent of these small airplanes	5,700’
95 percent of these small airplanes	8,070’
100 percent of these small airplanes	8,070’
Large Aircraft (<60,000 lbs.)	
75 percent of these planes at 60 percent useful load	7,900’
75 percent of these planes at 90 percent useful load	9,150’
100 percent of these planes at 60 percent useful load	11,550’
100 percent of these planes at 90 percent useful load	11,550’

Takeoff Distance Requirements: When determining runway length requirements for an 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. **Figure 3-3** gives examples of takeoff distance requirements for some of the aircraft currently using and projected to utilize Durango-Animas Airpark.

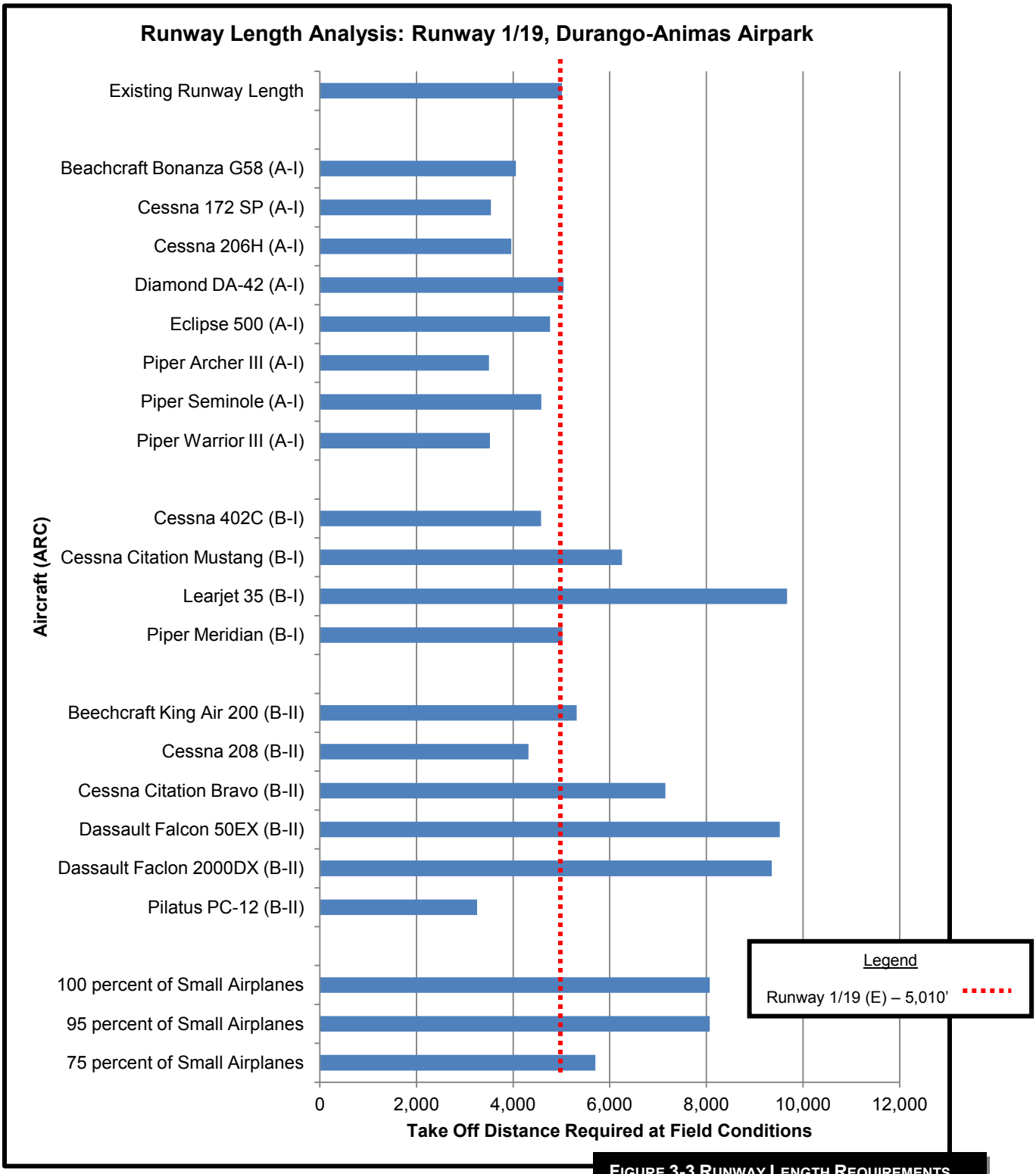


FIGURE 3-3 RUNWAY LENGTH REQUIREMENTS

Source: Aircraft Manufacturers Performance Data
Note: Aircraft performance data based on maximum certificated takeoff weight and mean maximum temperature of the hottest month of 85.0° F and an airport elevation of 6,688 feet above mean sea level (MSL).

Based on the required runway lengths for these categories of aircraft, the existing runway length of 5,010 feet accommodates the majority of AAC B aircraft that utilize Durango-Animas Airpark. The actual runway length requirements are dependent on several factors including topographical, environmental and fiscal constraints. The use of the runway at its existing length is at the discretion of the aircraft operator/pilot. The existing runway length accommodates the design aircraft and the majority of existing and forecasted aircraft and is therefore considered to be adequate.

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the Airpark on a regular basis. The existing pavement strength for Runway 1/19 is not published and assumed to be 12,500 pounds Single Wheel Gear (SWG). It is recommended to maintain a pavement strength of 12,500 pounds SWG.

FAA design standards for runways serving aircraft having a RDC of B-I (small) require a minimum runway width of 60 feet. Runway 1/19 does not satisfy this requirement. It is recommended to widen Runway 1/19 by 10 feet to meet the 60 foot width for RDC B-I (small) design standards.

3.2.2 Crosswind Runway Requirements

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. Based on wind data collected from the Durango-La Plata County Airport ASOS obtained between 2006 and 2014 and as depicted in **Table 3-9**, Runway 1/19 provides less than 95 percent crosswind coverage for A-I and B-I aircraft (10.5 knots). Based on the historical wind data from the Durango-La Plata County Airport, the development of an A-I or B-I crosswind runway is justified and will be further evaluated in Chapter Four – Development Alternatives. The installation of an AWOS and the collection of site wind data are recommended.

Table 3-9 Durango-Animas Airpark Wind Data (All-Weather)

	10.5 Knots (12 MPH)	13 Knots (15 MPH)
Runway 1/19	91.84%	95.18%

Source: Durango-La Plata County Airport ASOS, based on 99,916 observations from July 2006 to July 2014

3.2.3 Taxiway Requirements

Length and Width: The primary function of a taxiway system is to provide efficient access between runways and the FBO/terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

The Taxiway Design Group (TDG) is based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance of the design aircraft expected to operate on the taxiway. The future design aircraft, the Cessna 402C, is listed as a TDG I aircraft. The design standards for TDG I is listed in **Table 3-10**.

Table 3-10 TDG I Design Standards

Taxiway Design	Group I
Taxiway Width	25’
TSA	49’
Taxiway OFA	89’
Taxilane OFA	79’
RW centerline to parallel TW centerline	150’

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

It is recommended to construct a future partial parallel taxiway and an ultimate full-length parallel taxiway at 150 feet of separation in order to meet RDC of B-I (small) and visibility minimums not lower than ¾-mile. The potential to accommodate taxiway construction is further evaluated in Chapter Four – Development Alternatives.

3.2.4 Aircraft Parking Apron Requirements

The apron space requirements recommended in this planning document were developed according to AC 150/5300-13A, *Airport Design*. Consideration must be made in the overall apron sizing for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the Airpark. Durango-Animas Airpark has an asphalt apron of approximately 11,237 square yards and 17 cable-grounded tiedowns.

Tiedown Requirements:

Aircraft tiedowns should be provided for small and medium sized aircraft that utilize the Airpark. These aircraft risk being damaged from the presence of sudden wind gusts if not properly secured. The number of transient aircraft at the Airpark was calculated using the peak number of operations that were derived in Chapter Two – Forecasts of Aviation Activity. This information was then utilized in the calculation of tiedown requirements.

It is recommended to construct six new tiedowns in the planning period to accommodate forecasted activity. It is recommended to construct tiedowns which are recessed into the asphalt, rather than the current cable-grounded method. Recessed tiedowns allow for easier maintenance and less impacts during snow removal operations. The current tiedown layout does not meet Group I taxilane OFAs. It is recommended to reconfigure the apron in order to meet Group I taxilane requirements.

Apron Size Requirements:

Additional tiedowns and apron is recommended for the planning period. The existing 17 aircraft tiedowns are adequate for existing transient operations; however Durango-Animas Airpark should plan for additional apron and taxilane development to accommodate the forecasted increase in based and transient aircraft. A multi-use apron for general aviation is recommended to accommodate aircraft operations in the short, medium and long-term time frames. It is recommended to expand the apron 3,000 square yards to a total of 14,237 square yards to accommodate 23 future total tiedowns.

3.2.5 Helicopter Parking Requirements

Helicopter operations at Durango-Animas Airpark include a mix of activities in support of air ambulance, military, flight instruction, business, and private transportation. There are currently no helicopter parking pads at Durango-Animas Airpark. The forecasted design helicopter is the Bell 412. It is recommended to construct two public-use concrete helicopter parking pads to accommodate forecasted based and transient helicopter operations. An area of 71 square yards would be necessary to accommodate two parking areas for the design helicopter.

3.2.6 Navigational Aids

A Navigational Aid (NAVAID) is any ground based 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), Non-directional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples. No navigational aids are located within the immediate vicinity of the Airpark. The nearest NAVAID is the Durango VOR which is located approximately seven nautical miles southeast of the Airpark on the 284 degree radial. No additional NAVAIDS are recommended for the Airpark.

3.2.7 Instrument Approach Procedures

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the Airpark for navigation. 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, having approach minimums as low as 350-foot ceilings and 1-mile visibility are typical for this type of approach. The GPS receiver uses satellites for navigation. Therefore, it involves little or no cost for the Airpark sponsor. However, there may be other Airpark improvements, such as marking, lighting or obstruction removals which may be necessary to implement a GPS instrument approach. An instrument approach increases the utility of the Airpark by providing for the capability to operate in inclement weather conditions. This is especially important for air ambulance, physician transport and business flights. It is also useful for conducting training and maintaining instrument currency.

There are currently no instrument approach procedures at the Airpark. A GPS instrument approach with visibility minimums of not lower than ¾-mile is recommended for Durango-Animas Airpark. The potential instrument approach procedure development is further evaluated in Chapter Four – Development Alternatives.

3.2.8 Airfield Lighting, Signage, Marking and Visual Aids

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. The airfield lighting and visual aids at Durango-Animas Airpark consists of threshold lights on each runway end, Medium Intensity Runway Lights (MIRLs) on Runway 1/19 which are pilot controlled on the Common Traffic Advisory Frequency (CTAF) frequency 122.80 MHz and a lighted wind cone. Due to the availability of MIRLs, if a displaced threshold were to be implemented, the installation of distance remaining signs would be recommended. Taxiways are currently not outlined with any

lighting or reflector system. There is no signage to inform pilots of their position on the airfield. The airfield markings, lighting and visual aids are in poor condition. Runway 1/19 is currently marked with basic markings. Taxiway A has a six-inch yellow centerline stripe. The lighting of taxiways with Medium Intensity Taxiway Lights (MITLs) and aircraft parking apron/terminal area lighting is recommended. It is also recommended to install Precision Approach Path Indicators (PAPIs) on each runway end, lighted signage and a rotating beacon. It is also recommended to replace the existing MIRLs due to their existing condition.

3.2.9 Non-Standard Conditions

As described in Chapter One – Inventory, Durango-Animas Airpark does not comply with several of the design standards for RDC B-I (Small) as listed in FAA AC 150/5300-13A, *Airport Design*. It is recommended to the maximum extent possible that all non-standard conditions be corrected or mitigated to meet the design standards set forth by the FAA. The potential mitigation methods for each specific design standard deficiency are further evaluated in Chapter Four – Development Alternatives.

3.3 Landside Facility Requirements

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

3.3.1 Terminal Building

The terminal building at general aviation airports (often called pilot lounges) typically offer various amenities to passengers, local and transient pilots and Airpark management. They most often house public restrooms, public telephones, a pilot's lounge and information regarding Airpark services. There is no existing terminal building at Durango-Animas Airpark. It is recommended to construct a terminal building/pilot lounge able to satisfy the forecasted peak hour general aviation pilot and passenger demand.

3.3.2 Hangar Facilities

Hangars are typically classified as either T-hangars, small multi-unit storage complexes that accommodate one single-engine aircraft in each unit or conventional hangars that are comprised of small to very large units, able to accommodate a wide variety of aircraft types and quantities. The number of aircraft that each conventional hangar holds varies according to the size of hangars available from manufacturers and the specifications imposed by the operators needs. The existing hangars at Durango-Animas Airpark include one single-unit T-hangar and 18 conventional box hangars.

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 at the Airpark. It is recommended to construct eight conventional hangars and six T-hangars to accommodate the forecasted based aircraft demand. The construction of the hangars would be entirely demand driven. Development areas will be identified on the ALP for a mix of hangars to accommodate future growth and to protect areas for development beyond the 20-year planning period.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail or snow) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter. There currently are no hangars designated for transient use. It is recommended that hangar space be made available for transient use to enable aircraft to be stored during periods of inclement weather. It is recommended that approximately 4,000 square feet of hangar space be provided to accommodate transient aircraft.

3.3.3 Fixed Base Operator Services

Fixed Base Operator services are provided at Durango-Animas Airpark by Gregg Flying Service. Services offered include aircraft maintenance and a pilot lounge. Fueling services are available during business hours through use of a fuel dispensing truck. Fuel storage consists of one 10,000 gallon capacity underground storage tank containing 100-Low Lead AvGas. Jet-A fuel is stored and distributed with a 1,400 gallon fuel dispensing truck. It is recommended to construct an additional 10,000 gallon capacity above ground storage tank for Jet-A. **Figure 3-4** depicts the underground fuel storage tank at Durango-Animas Airpark.

FIGURE 3-4 UNDERGROUND STORAGE TANK

3.3.4 Airpark Access and Automobile Parking

There is no existing dedicated automobile parking area. It is recommended that an airport's automobile parking be able to satisfy the forecasted peak hour general aviation pilot and passenger demand. Utilizing methods most commonly used by the FAA for calculating parking space requirements, **Table 3-11** depicts the automobile parking space requirements during the 20-year planning period. It is recommended that gravel or paved parking be developed to accommodate 60 automobile spaces in the long-term time frame.

Table 3-11 Automobile Parking Area Requirements Forecast

Year	Parking Spaces Requirements	Parking Lot Requirements (Square Yards)
2019	49	1,740
2024	53	1,882
2029	56	1,988
2034	60	2,130

Note: Based Aircraft Number = Parking Space Requirements
Each parking space includes 35.5 square yards

Durango-Animas Airpark is accessed by a single-access point, Airpark Drive, approximately five miles south of Durango. As shown in **Figure 3-5**, traffic approaching the Airpark on Airpark Drive can access Airpark facilities at the intersection with Skylane Drive.

In 2012, the City of Durango and La Plata County commissioned a study to evaluate and plan for the area surrounding Durango-Animas Airpark. The single access to the area creates increased instances of vehicle congestion and limits accessibility of response vehicles in an emergency situation. According to the La Posta Area Plan, development of Durango-Animas Airpark has "stalled out" due to the limited accessibility to the area. Specifically, commercial and residential development is no longer feasible with the existing single-access road. The Plan also describes issues that heavy commercial vehicles using Airpark Drive face during winter months due to the single access point and steep roadway grade. In the event of an accident occurring on Airpark Drive, the connection from Durango-Animas Airpark to the surrounding area would be closed.

La Plata County Board of Commissioners Resolution 2014-18 requires a 20 foot wide emergency access route for development with an Annual Daily Traffic (ADT) between 200 and 800 and a secondary access road for development with an ADT greater than 800. Airpark Drive has an existing ADT of 967 and therefore is required to have a secondary access road.

It is recommended to construct a secondary access road to provide optimum vehicle circulation, greater access during emergency situations and facilitate future commercial or residential growth. The potential secondary access road will be further evaluated in Chapter Four – Development Alternatives.

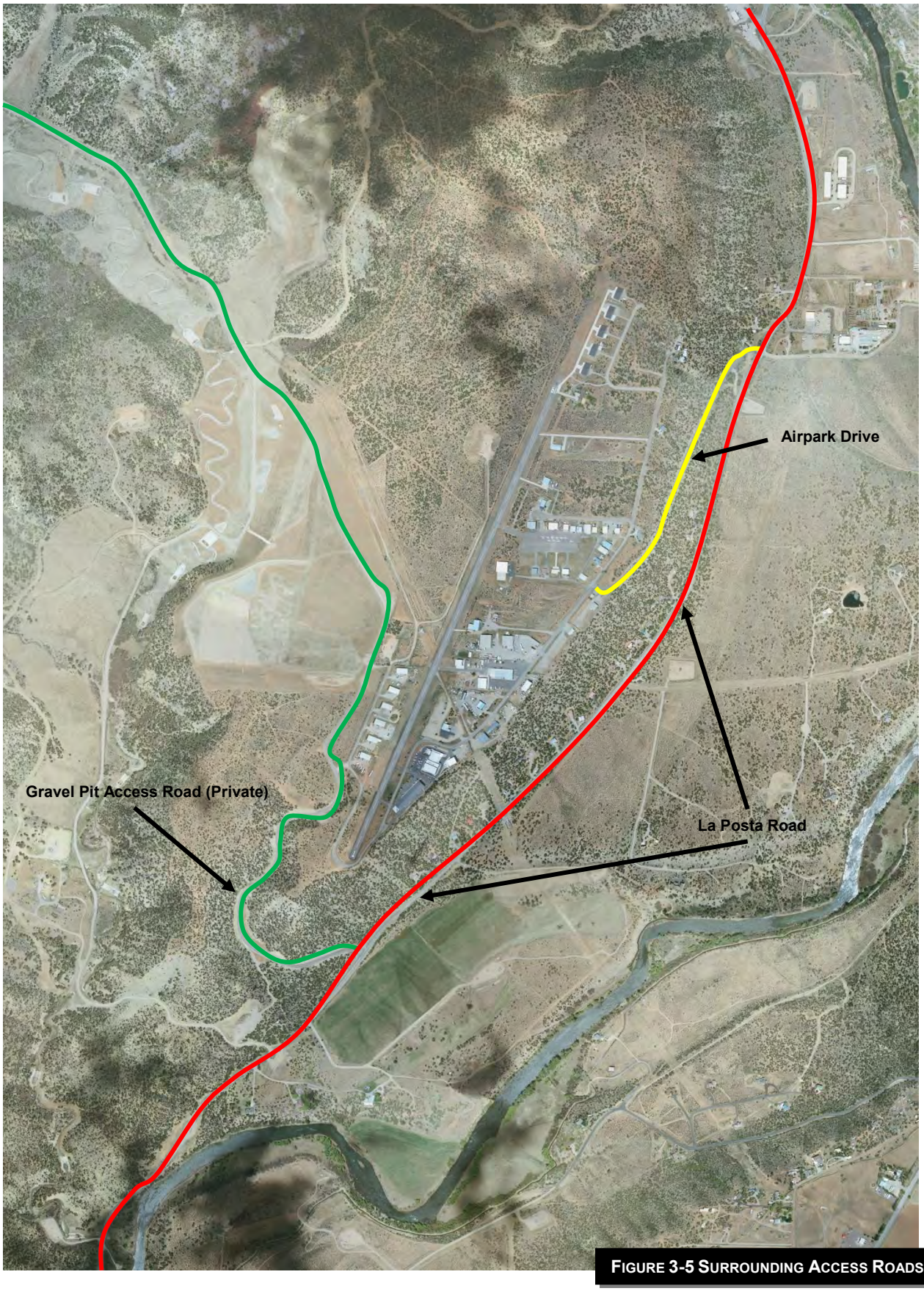


FIGURE 3-5 SURROUNDING ACCESS ROADS

3.3.5 Fencing

Durango-Animas Airpark has a partial perimeter fence along the western boundary of Runway 1/19. The primary purpose of airport fencing is to restrict inadvertent access to the Airpark by wildlife and persons. Full perimeter and terminal area fencing is recommended at the Airpark to keep the general public from entering the aircraft operations area. This terminal area fencing should include allowing for public access to the hangars and businesses but prevent public access to the aircraft parking apron. The installation of access controls, such as electric gates with keypads, is recommended.

3.3.6 Security

There are several programs designed to increase general aviation airport security including the Aircraft Owners and Pilots Association (AOPA) Airport Watch program which created an around the clock telephone hotline answered by federal authorities. The *Transportation Security Administration (TSA) Security Guidelines for General Aviation Airports* provides a set of federally-endorsed recommendations to enhance security for municipalities, owners, operators, sponsors and other entities charged with oversight of general aviation airports. The TSA's guidance provides nationwide consistency with regard to security at general aviation facilities, as well as a rational method for determining when and where these enhancements may be appropriate based upon the operational profile of differing airports. The guidelines offer an extensive list of options, ideas, suggestions and proven best practices for the airport operator, sponsor, tenant and/or user to choose from when considering security enhancements. The TSA's guidelines are updated and modified as new security enhancements are developed and as input from the general aviation community is received. It is recommended Durango-Animas Airpark participates in the AOPA Airport Watch program and follows all guidelines set forth by the TSA.

3.3.7 Aircraft Rescue and Fire Fighting (ARFF)

Aircraft Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with 10 or more 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 and developed with 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 AC 150/5210-6D, *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.

Fire extinguishers are available at Durango-Animas Airpark and the Durango Fire and Rescue Authority responds to emergencies at the Airpark. The Durango Fire and Rescue Authority

owns and maintains over 50 rescue vehicles for use. Estimated response time to the Airpark is six minutes. It is recommended that the Durango Fire and Rescue Authority continue to meet compliance with the recommendations contained in AC 150/5210-6D, *Aircraft Fire and Rescue Facilities and Extinguishing Agents*.

3.3.8 Maintenance and Snow Removal Equipment Storage Building

There are currently no existing equipment storage buildings at Durango-Animas Airpark. Currently, maintenance equipment is stored outdoors adjacent to Gregg Flying Service. An equipment storage building is recommended to protect existing and future Airpark maintenance equipment. The structure will provide a secure area to store items such as a mower, sweeper, and snow removal equipment. Having a dedicated facility will maximize operational performance for the necessary support items for the Airpark. It is recommended to acquire one snow blower, one sweeper and two plows to adequately remove snow during the winter months.

3.4 Infrastructure Needs

3.4.1 Utilities

The existing gas, power and telecommunication primary service lines at Durango-Animas Airpark are considered to be adequate to accommodate the current facilities. It is recommended that existing gas, power and telecommunication utilities be extended into future Airpark development areas.

The La Posta Area Plan identifies deficiencies with water and sewer utilities to Durango-Animas Airpark. The existing water is provided via wells and waste water is disposed via private septic systems. The La Posta Area Plan describes that the lack of central water and sewer has hampered additional development from occurring within the vicinity of Durango-Animas Airpark. A 12” diameter waterline which will serve Airpark properties is currently planned for construction in the short-term with funding assistance by CDOT. The waterline will run parallel to Runway 1/19 and will have connections along Flight Line Road and in the vicinity of North Skyline Road. **Figure 3-6** depicts an approximate location of the future waterline. The project is anticipated to be completed in December 2014. It also is recommended to extend sewer services to Durango-Animas Airpark to replace the existing private septic systems. Details on extended utilities will be evaluated in detail as a part of Chapter Four – Development Alternatives.

FIGURE 3-6 FUTURE WATERLINE LOCATION

3.4.2 Weather Reporting

There is no weather reporting station on-site at Durango-Animas Airpark. The nearest weather reporting station is the Durango-La Plata County Airport ASOS located approximately six miles southeast. As discussed in Chapter One – Inventory, Variations in terrain and elevation limit the applicability of the Durango-La Plata County Airport ASOS to pilots operating in or out of Durango-Animas Airpark. It is recommended to install an Automated Weather Observation Station (AWOS) at Durango-Animas Airpark which would increase the safety and utility of the Airpark for aviation users.

3.5 Land Use Compatibility and Control

3.5.1 Airpark Property

The area containing the runway and taxiway is approximately 35 acres according to La Plata County property records. Much of the property included in the Airpark boundary is privately owned. The existing Runway Protection Zones (RPZs) are not controlled by the Airpark Association. Additional land may be needed to meet design standards, to control RPZs, or to accommodate future Airpark development. These areas will be identified in Chapter Four – Development Alternatives, depicted on the ALP and Exhibit A Property Map.

3.5.2 Airport Zoning

Airport zoning ordinances should include height restrictions and land use compatibility regulations. 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 Part 77 Airspace Surfaces (described in the following section). CDOT therefore recommends that all Airport Sponsors implement height restrictions in the vicinity of the Airpark to protect these Part 77 Surfaces. There are currently hangars and residences located within the RPZ. The Airpark area is located in a designated Business/Industrial Park Overlay Zone per La Plata County Code of Ordinances Zoning Resolution Number 1995-19. The City of Durango and La Plata County have not zoned the Airpark and surrounding land exclusively for Airpark use. The development and adoption of an Airport Overlay Zone is recommended to help protect the Airpark from future incompatible land uses. The Off-Airport Land Use drawing and Part 77 Airspace drawing that are being developed as a part of this Airpark Master Plan should be used in the development of the Airport Overlay Zone. The development of an on-airport Airpark Zone is also recommended to establish appropriate standards for future Airpark development.

3.5.3 Compatible Land Use

The FAA states in AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, such as 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 powered aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater 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 Airpark. Land use compatibility considerations include safety, height hazards and noise exposure. 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 Airpark. Land uses may be reviewed in four zones surrounding the Airpark: the Runway Protection Zone (RPZ), the Approach Zone, Airport Influence Zone and the Traffic Pattern Zone. The RPZ is a trapezoidal area extending 1,200 feet beyond the ends of the runway and is typically included within the Airpark property boundary. Residential and other uses that result in congregations of

people should be restricted from the RPZ. The approach zone generally falls within the Part 77 Approach Surface area. Within the approach zone, public land uses, such as schools, libraries, hospitals and churches should be avoided. New residential developments within this zone should include avigation easements and disclosure agreements. The Traffic Pattern Zone is generally the area within one mile of the Airpark. Within the Traffic Pattern Zone, avigation easements should be considered for residential and public uses and disclosure statements should be required. The Airport Influence Zone is the area where aircraft are transitioning to or from enroute altitude or airport over-flight altitude to or from the standard traffic pattern altitude.

3.6 Part 77 Airspace Surfaces

14 CFR Part 77 establishes several imaginary surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activities. These surfaces should serve as the basis for any height restriction zoning. A graphical depiction of Part 77 surfaces are depicted in **Figure 3-7**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight or less with a straight-in instrument approach procedure and instrument designation indicated on an approved airport layout plan. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure. Runways with only “circling” instrument approaches are considered “visual” for Part 77 purposes.

Durango-Animas Airpark does not currently have any instrument approach procedures for Runways 1 or 19. Runway 1/19 is currently considered a visual/utility runway. The existing and future Part 77 Airspace Surfaces are listed in **Table 3-10**. The Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of Part 77 airspace surfaces, in some cases, penetrations (also known as obstructions) may be mitigated with appropriate marking and/or lighting. A detailed list of known Part 77 penetrations will be included in the ALP drawing set.

3.6.1 Primary Surface

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. The Primary Surface extends 200 feet beyond each end of the paved runway surface, but begins at 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. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on pavement strength, type of approach and approach visibility minimums.

3.6.2 Approach Surface

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

3.6.3 Transitional Surface

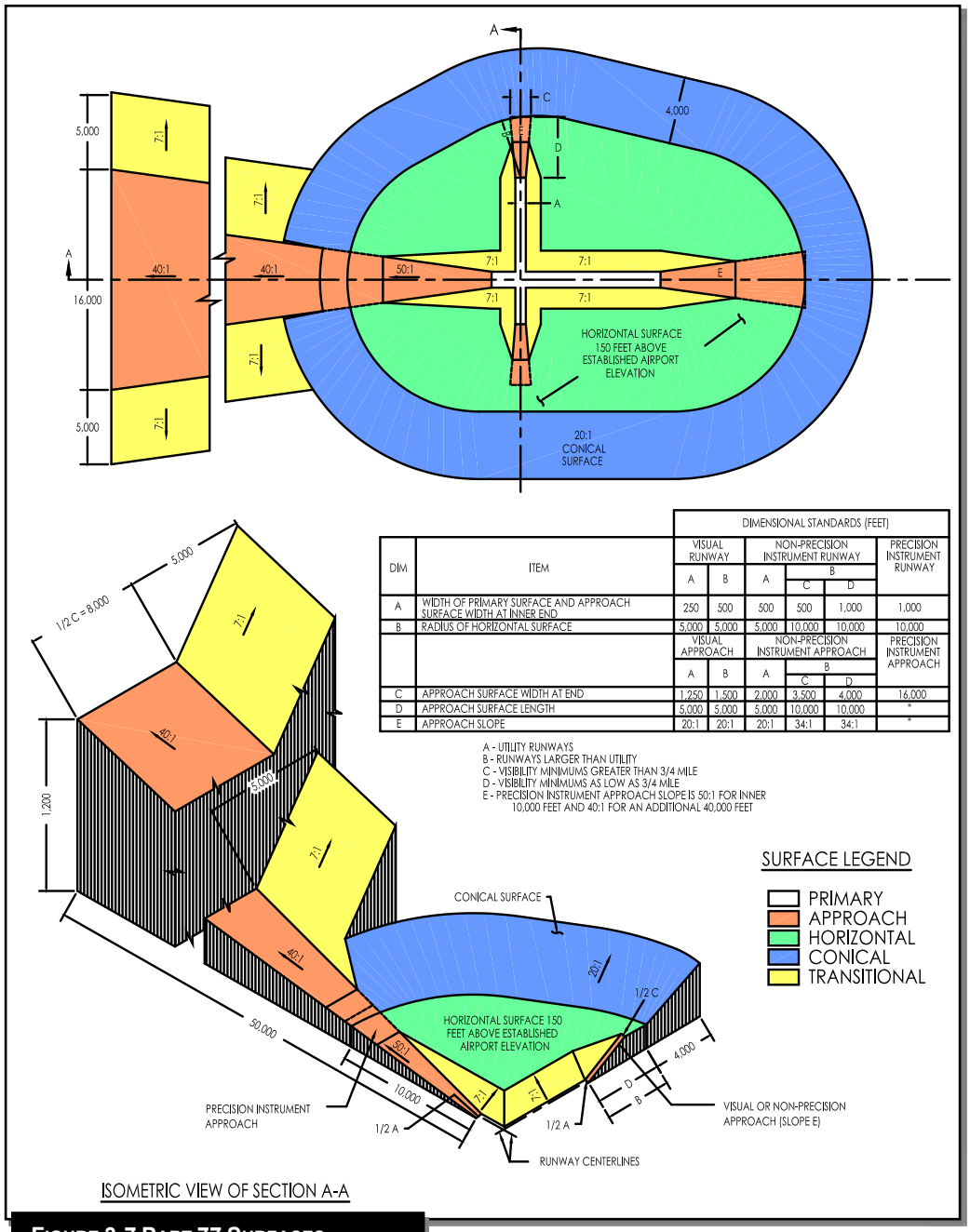
The Transitional Surfaces extend outward and upward at right angles from the runway centerline and sides of the Primary and Approach Surfaces at a slope of 7:1 ending at the Horizontal Surface.

3.6.4 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 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 a 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.

3.6.5 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.



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 3-7 PART 77 SURFACES

3.7 Summary of Design Standards and Facility Requirements

Table 3-12 summarizes the FAA design standards (described in Chapter One – Inventory) for the recommended airport facilities during the short, medium and long-term time frames. **Table 3-13** summarizes the facility requirements for Durango-Animas Airpark. The recommendations are based on the types and volume of aircraft expected to utilize the Airpark in the short, medium and long-term time frames. These recommended facilities will enable the Airpark to continue to serve its users in a safe and efficient manner.

Table 3-12 Summary of Dimensional Criteria for Runway 1/19

Design Criteria	Existing	Future
Runway Design Code	B-I (Small)	Same
Runway Reference Code	B-I (Small)	Same
Approach Type RW 1	Visual	Nonprecision (NPI)
Approach Type RW 19	Visual	NPI
Runway centerline to parallel taxiway centerline	150' (None Actual)	150'
Runway centerline to edge of aircraft parking apron	125' (270' Actual)	Same
Runway width	60' (50' Actual)	60'
Runway shoulder width	10' (0' Actual)	10'
Runway Safety Area width	120' (0' Actual)	120'
Runway Safety Area length beyond runway end	240' (0' Actual)	240'
Runway Object Free Area width	250' (165' Actual)	250'
Runway Object Free Area length beyond runway end	200' (40' Actual)	200'
Runway Obstacle Free Zone width	250' (165' Actual)	250'
Runway Obstacle Free Zone length beyond runway end	200' (40' Actual)	200'
Runway Protection Zone RW 1	250' x 450' x 1,000'	Same
Runway Protection Zone RW 19	250' x 450' x 1,000'	Same
Taxiway width	25' (30' Actual)	Same
Taxiway Safety Area width	49'	Same
Taxiway Object Free Area width	89' (70' Actual)	89'
Taxilane Object Free Area width	79' (65' Actual)	79'
Runway centerline to aircraft hold lines	125' (82' Actual)	125'
Airspace Surfaces (Part 77) RW 1	Visual - Utility	NPI Runway - Utility
Airspace Surfaces (Part 77) RW 19	Visual - Utility	NPI Runway - Utility
Primary Surface width	250'	500'
Primary Surface length beyond runway ends	200'	Same
Approach Surface dimensions RW 1	250' x 1,250' x 5,000'	500' x 2,000' x 5,000'
Approach Surface dimensions RW 19	250' x 1,250' x 5,000'	500' x 2,000' x 5,000'
Approach Surface slope RW 1	20:1	20:1
Approach Surface slope RW 19	20:1	20:1
Transitional Surface slope	7:1	7:1
Horizontal Surface radius from runway	5,000'	5,000'
Conical Surface width	4,000'	4,000'

Source: FAA AC 150/5300-13A, *Airport Design*; Part 77, *Objects Affecting Navigable Airspace*

Table 3-13 Summary of Airpark Facility Requirements

	Existing	Future
DIMENSIONS		
ARC	B-I (Small)	Same
Length	5,010’	5,010’
Width	50’	60’
Strength	Unpublished	12,500 lbs. SWG
MARKINGS		
Runway 1	Non-precision	Same
Runway 19	Non-precision	Same
TAXIWAYS		
Design Group	I	Same
Partial Parallel	No	Yes
Full Parallel	No	Yes
Bypass Taxiways	No	No
Width	30’	25’ or Same
Strength (pounds)	Unpublished	12,500 lbs. SWG
NAVAIDS		
Approaches	Visual	GPS
LIGHTING		
Runway Edge	MIRL	Replace with New
Threshold Lights	Yes	Replace with New
REILs	No	Yes
Approach Slope Indicator	No	Yes
Approach Lighting System	No	Same
Taxiway Edge Lights	No	MITL
VISUAL AIDS		
Segmented Circle/Wind Cone	Yes	Same
Rotating Beacon	No	Yes
ACCESS & PARKING		
Automobile	0	60*
APRON		
Tie Downs	17	23*
HANGAR FACILITIES		
T-Hangars	1	7*
“Conventional” (Box Hangar)	18	28*
FUEL STORAGE		
100 LL	10,000 Gallons	Same
Jet-A	None (Truck-only)	10,000 Gallon
OTHER		
Weather Station	None	AWOS
Unicom	Yes	Same

*As required based on demand and development feasibility.

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CHAPTER FOUR

DEVELOPMENT ALTERNATIVES

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER FOUR
DEVELOPMENT ALTERNATIVES

4.0 Introduction

This chapter contains the description and evaluation of various development alternatives for Durango-Animas Airpark. The basis for the airside and landside alternatives was derived from the recommendations contained in Chapter Three – Facility Requirements.

According to FAA AC 150/5070-6B, *Airport Master Plans*, each identified alternative's technical feasibility, economic and fiscal soundness, and aeronautical utility should be examined. Ultimately, development alternatives will only be considered that meet the Animas Airpark Property Owners Association planning needs and those that the State and/or Sponsor will be realistically able to implement.

4.1 Development Concepts

The overall objective of the alternatives analysis is to 1) review the facility requirements that have been recommended to meet FAA design standards and safely and efficiently accommodate aviation demand over the planning period; and 2) evaluate the best way to implement the facility requirements as presented in Chapter Three – Facility Requirements.

A range of airside and landside alternatives are typically created and evaluated in both a quantitative and qualitative manner for implementing the different facility requirements. In other instances where less robust development is anticipated, the selection of a preferred development plan can result from a simple logical evaluation of the various options resulting from discussions with the sponsor.

The following best planning tenets, as recommended in FAA AC 150/5070-6B, *Airport Master Plans*, apply to the evaluation of the development alternatives:

- Conforms to best practices for safety and security
- Conforms to FAA and other appropriate design standards
- Provides for the land use on and off airport
- Allows for forecast growth throughout the planning period
- Provides for growth beyond the planning period
- Provides balance between developmental elements
- Provides flexibility to adjust to unforeseen changes
- Conforms to the Sponsor's strategic vision.
- Conforms to relevant local, regional, and state transportation plans
- Is technically and financially feasible
- Is socially and politically feasible
- Satisfies user's needs

A combination of effective airside and landside planning is essential to the successful development of the airport. Airside facilities are those used for taxiing, takeoff, landing or parking of aircraft. Landside facilities generally consist of a system of buildings, fuel systems, roadways, and vehicle parking areas in support of airside activities.

4.2 Future Airside Development Alternatives

4.2.1 Taxiway System

Chapter Three – Facility Requirements recommends a full length parallel taxiway with a runway to taxiway centerline separation of 150 feet be developed at the airport. Due to physical constraints along both sides of Runway 1/19, various alternative methods to increase aircraft circulation and enhance aviation safety in lieu of a full-length parallel taxiway at Durango-Animas Airpark have been evaluated. **Table 4-1** lists the description, advantages, disadvantages and estimated cost of each alternative. **Figures 4-1** through **4-3** depict Alternatives 1, 2 and 3 respectively. Alternative 4, the no action alternative, is not graphically depicted.

Table 4-1 Taxiway System Alternatives

Alt.	Description	Advantages	Disadvantages	Estimated Cost
1	Construct a full-length parallel taxiway along the east side of Runway 1/19	Would provide optimum aircraft circulation and enhance safety Would eliminate the need to back-taxi on the active runway Provides the recommended taxiway development	Requires the acquisition and removal of five commercial and industrial properties Requires the realignment of one parking lot Moves aircraft operation closer to existing and future residential properties Substantial topographical constraints High potential for environmental impacts Requires the realignment of South Skyline Drive	$7,150,000
2	Construct a partial parallel taxiway connecting the aircraft parking apron to the Runway 19 end	Would provide increased aircraft circulation Would reduce the length of back taxi on the active runway	Moves aircraft operations closer to existing and future residential properties Potential for environmental impacts Does not provide the recommended full length parallel taxiway	$800,000
3	Construct turnarounds on each runway end	Provides increased aircraft circulation Allows aircraft to conduct engine run-ups prior to departure on both runway ends Reduced potential for environmental impacts	Would not provide optimum aircraft circulation Aircraft would still be required to back-taxi for operations on both runway ends Does not provide the recommended full length parallel taxiway	$600,000
4	No Action	Requires no state or local investment No potential environmental impacts No runway closures during construction Requires no construction or adjustment to existing airport layout configuration	No increased aircraft circulation Aircraft would be required to continue back taxiing on the active runway for operations on both runway ends Does not provide the recommended full length parallel taxiway	$0

Note: All cost estimates use 2014 dollars

4.2.2 Correction of Non-Standard Conditions

Due to Durango-Animas Airpark's existing layout and surrounding constraints, correcting all non-standard conditions to the airfield design is not feasible. **Table 1-8** lists the existing non-standard conditions at Durango-Animas Airpark. **Table 4-2** lists the description, advantages, disadvantages and estimated cost of each alternative. **Figures 4-4** and **4-5** depict Alternatives 1 and 2 respectively. Alternative 3, the no action alternative, is not graphically depicted.

Table 4-2 Non-Standard Conditions Correction Alternatives

Alt.	Proposed Action	Advantages	Disadvantages	Estimated Cost
1	Displace the Runway 1 threshold by 577'	Would not require any land acquisition Would provide sufficient RSA, ROFA and ROFZ length beyond runway end Minimal potential for environmental impacts	Would require closure of runway during remarking Would require the use of declared distances Does not provide RPZs free of structures	$210,000
2	Extend Runway 1/19 to the north by 1,138' to a future length of 6,148' Displace the Runway 1 threshold by 577'	Would extend RPZ beyond hangars Provides a runway length which would accommodate 76 percent of small aircraft Would provide sufficient RSA, ROFA and ROFZ lengths	Requires the acquisition of +/- 5 acres of land Would require closure of runway during construction Potential for environmental impacts Would require the use of declared distances (see below)	$925,000
3	No Action	Requires no state or local investment No potential environmental impacts No runway closures Requires no construction or adjustment to existing airport layout configuration	Would not correct insufficient RSA, ROFA and ROFZ	$0

Note: All cost estimates use 2014 dollars

<u>Declared Distances</u>

Declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff and landing performance requirements. Each distance is treated independently and may vary for each operational direction. The definitions of each declared distance are as follows:

- Takeoff Run Available (TORA): The runway length available for the takeoff run.
- Takeoff Distance Available (TODA): The TORA distance combined with a clearway length, if available.
- Accelerate Stop Distance Available (ASDA): The declared distance for a rejected takeoff which is the TORA distance combined with a stopway length, if available.

- Landing Distance Available (LDA): The runway length available for a landing aircraft.

4.2.3 Aircraft Apron

The existing general aviation aircraft apron layout would not be able to accommodate future forecasted peak hour operations and based aircraft. It is recommended to expand the aircraft parking apron to accommodate future peak hour operations while protecting for additional development to occur if actual demand exceeds the forecasted amount. The recommended aircraft apron configuration is depicted in **Figure 4-6**.

4.2.4 Lighted Wind Cone and Segmented Circle

It is recommended to install a lighted wind cone and segmented circle east of Runway 1/19 near midfield. The recommended location was selected as it would not impact or be impacted by any existing or future airport facilities. See **Figure 4-8**.

4.2.5 Rotating Beacon

It is recommended to install the rotating beacon north of existing public use apron area. The recommended location was selected as it would not impact any future development within the planning period. See **Figure 4-8**.

4.2.6 Automated Weather Observation Station

As mentioned, Durango-Animas Airpark does not have any on-field weather reporting capabilities. It is recommended to install an AWOS-III to increase situational awareness for pilots departing or arriving at Durango-Animas Airpark. The AWOS location should meet FAA sitting criteria and provide for a 500 foot radius clear of obstacles to ensure system accuracy. It is recommended to install the AWOS to the west of the middle portion of Runway 1/19. The recommended location would require the acquisition of +/- 0.5 acres of land. See **Figure 4-8**.

4.3 Future Recommended Landside Development

All future landside and terminal area development is shown in **Figure 4-6**.

4.3.1 General Aviation Terminal and Snow Removal Equipment (SRE) Storage Buildings

As documented in the previous chapters, Durango-Animas Airpark serves a variety of airport users and a multi-use terminal/snow-removal equipment storage building is recommended to accommodate various transient aircraft and passengers. Additionally, there is no dedicated structure to accommodate the storage of SRE and airport maintenance equipment. It is recommended to construct a joint-General Aviation Terminal and SRE Storage Building northwest of the Fixed Base Operator. The General Aviation Terminal should accommodate a pilot lounge area, restrooms and one office area. The SRE storage building should be constructed to a size of 3,600 square feet and accommodate two bay doors for snow removal and maintenance equipment.

4.3.2 Airport Access and Automobile Parking

There is no existing paved public use automobile parking available at Durango-Animas Airpark. It is recommended to construct an automobile parking lot capable of accommodating 60 vehicles outside of the aircraft operations area. The location would be adjacent to the proposed General Aviation Terminal.

Existing and future development is constrained at Durango-Animas Airpark in part to the lack of a secondary access road to the area. The existing average daily traffic count justifies the connection of a secondary access road to the Durango-Animas Airpark area. **Table 4-3** lists the alternatives to incorporate secondary access to the area. **Figure 4-7** depicts Alternatives 1 and 2, respectively. Alternative 3, the no action alternative, is not graphically depicted.

Table 4-3 Secondary Access Road Alternatives

Alt.	Proposed Action	Advantages	Disadvantages	Estimated Cost
1	Obtain an easement on the existing private gravel pit access road to the south of Durango-Animas Airpark	Eliminates existing development constraints Increases access to Durango-Animas Airpark during emergency events Access road is already connected to South Skyline Drive Minimal environmental impacts	Cost of purchasing easement from owner	$ 1,400,000
2	Construct new secondary access road connecting North Skyline Drive to La Posta Road	Eliminates existing development constraints Increases access to Durango-Animas Airpark during emergency events Does not impact access to adjacent gravel pit	Requires the acquisition of +/- 6.6 acres of land Substantial topographical constraints would drive construction costs Potential for environmental impacts	$4,500,000
3	No Action	Requires no state or local investment No potential environmental impacts	Does not meet the overall needs and goals of the Airpark Safety hazard to residents and users of Durango-Animas Airpark Negative impact to future development	$0

Note: All cost estimates use 2014 dollars

4.3.3 Utilities

The lack of an existing water line and sewer services is another driving force in the constraint of development at Durango-Animas Airpark. As mentioned, a water line is currently scheduled to be constructed within the short-term. Chapter Three – Facility Requirements recommended the extension of sewer services. **Table 4-4** lists the alternatives for providing sanitary sewer services to Durango-Animas Airpark. **Figure 4-8** depicts Alternatives 1. Alternative 2, the no action alternative, is not graphically depicted.

Table 4-4 Sanitary Sewer Extension Alternatives

Alt.	Proposed Action	Advantages	Disadvantages	Estimated Cost
1	Construct sanitary sewer line connecting Durango-Animas Airpark to the sewer line at La Posta Road	Meets the overall needs and goals of the Sponsor Eliminates existing development constraints Allows for greater usage over existing septic system	Potential for environmental impacts during construction Cost associated with construction of new sewer line	$725,000
2	No Action (Continued utilization of septic systems)	Requires no state or local investment No potential environmental impacts	Does not meet the overall needs and goals of the Sponsor Negative economic impacts related to future activity constraints	$0

Note: All cost estimates use 2014 dollars

4.3.4 Terminal Area and Wildlife Fencing

There is no existing controlled access to the aircraft operations area at Durango-Animas Airpark. This allows for potential inadvertent or unauthorized access by pedestrians, vehicular traffic or wildlife into the aircraft operations area. Chain-link terminal area fencing with an electric vehicle access gate and pedestrian access gate should be constructed to encompass the terminal area to enhance the airport's security and safety.

The existing fence along the western boundary of Runway 1/19 does not adequately prevent wildlife from entering the Airpark property and aircraft movement surfaces. It is recommended to replace the existing fence and construct a 5,110 linear foot wildlife fence along the western and northern boundaries of the Airpark property to mitigate the entry of wildlife. See **Figure 4-8**.

4.4 Other Considerations

4.4.1 Runway 1/19 Wind Coverage

Based on Durango-Animas Airpark's wind analysis, gathered between 2006 and 2014, Runway 1/19 does not provide the recommended 95 percent wind coverage for A-I and B-I aircraft. Based on the following, a crosswind runway at Durango-Animas Airpark was not recommended for further consideration:

- Low funding priority for crosswind runway development from CDOT Aeronautics Division
- No expressed interest to construct a crosswind runway
- Substantial physical and topographical constraints surrounding the Airpark
- Significant property acquisition required
- The existing wind coverage being close to 95 percent

4.4.2 Instrument Approach Procedure Development

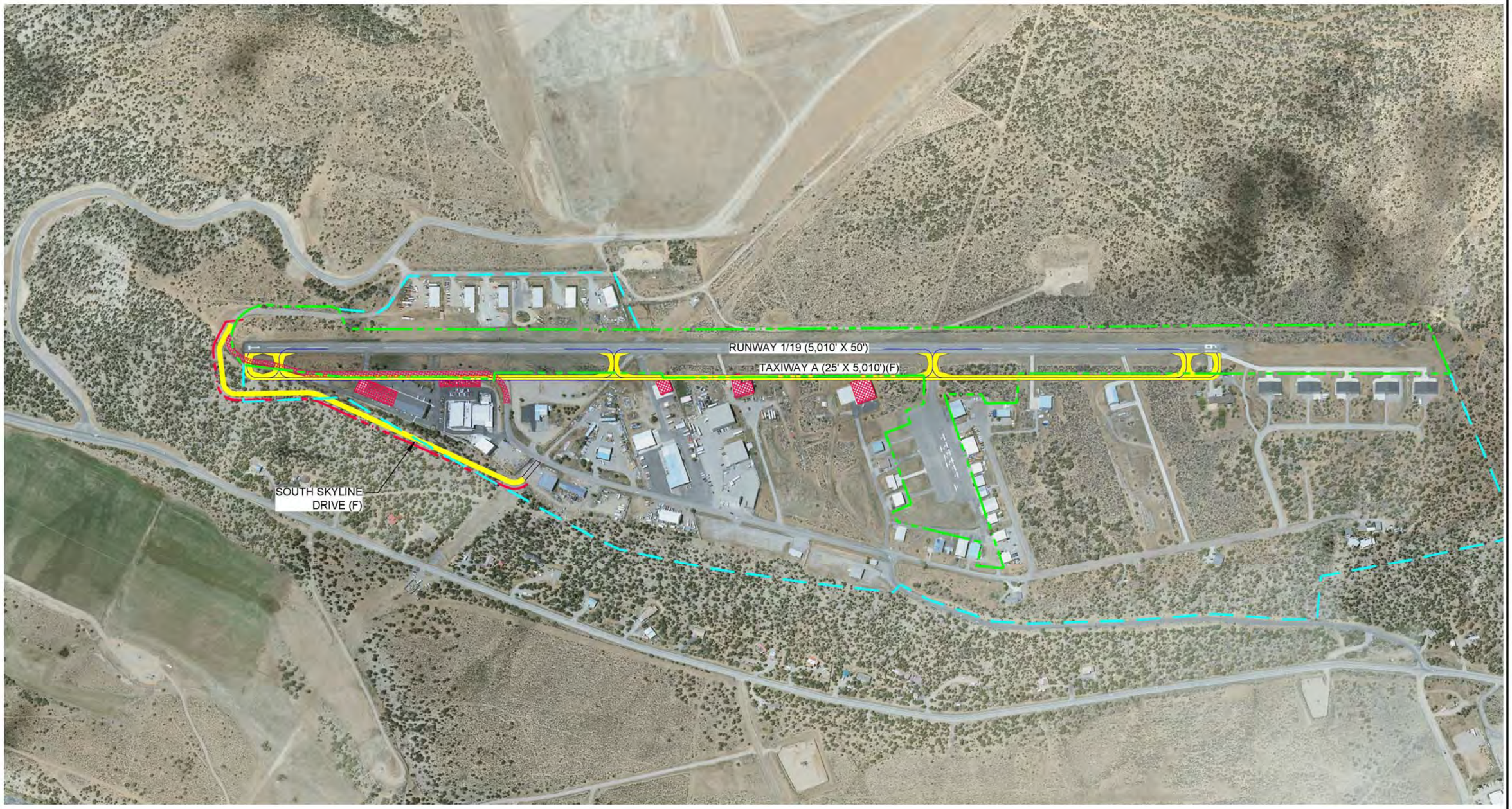
Chapter Three – Facility Requirements recommended an instrument approach procedure with visibility minimums of not lower than ¾-mile. As instrument approach procedures influence the airfield design standards, it is important to first consider the effects of procedure development on the airport. The instrument approach procedure would result in an increase of the imaginary

surfaces dimensions surrounding the runway. The increase of the Part 77 imaginary surfaces would substantially impact existing and future development within the immediate vicinity of Durango-Animas Airpark which includes several private land owners. The costs associated with accommodating any instrument approach procedure include an aeronautical survey, retrofitting existing structures with obstruction lights, the removal of existing structures and constraints to future development. Additionally, Durango-Animas Airpark is in close proximity to Durango-La Plata County Airport which has Instrument Landing System (ILS), GPS and VHF Omni Directional Radio Range (VOR) instrument approach procedures. Therefore, the cost associated with approach development exceeds the benefit of the instrument approach procedure and is not considered to be feasible.

4.5 Recommendations and Conclusion

A Technical Advisory Committee meeting was held to determine the recommended development to carry forward onto the Airport Layout Plan. Based on the meeting, the following alternatives were selected as recommended development and are depicted in **Figure 4-9**:

- Taxiway System: Alternative 2 with a bypass taxiway on the Runway 1 end and turnaround near midfield.
- Non-Standard Conditions Corrections: Alternative 2
- Secondary Access Road: Alternative 1
- Sanitary Sewer Extension: Alternative 1



EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE AIRPORT PROPERTY LINE

FUTURE ASPHALT

TO BE REMOVED

250 0 250 500

SCALE IN FEET

TAXIWAY ALTERNATIVE I

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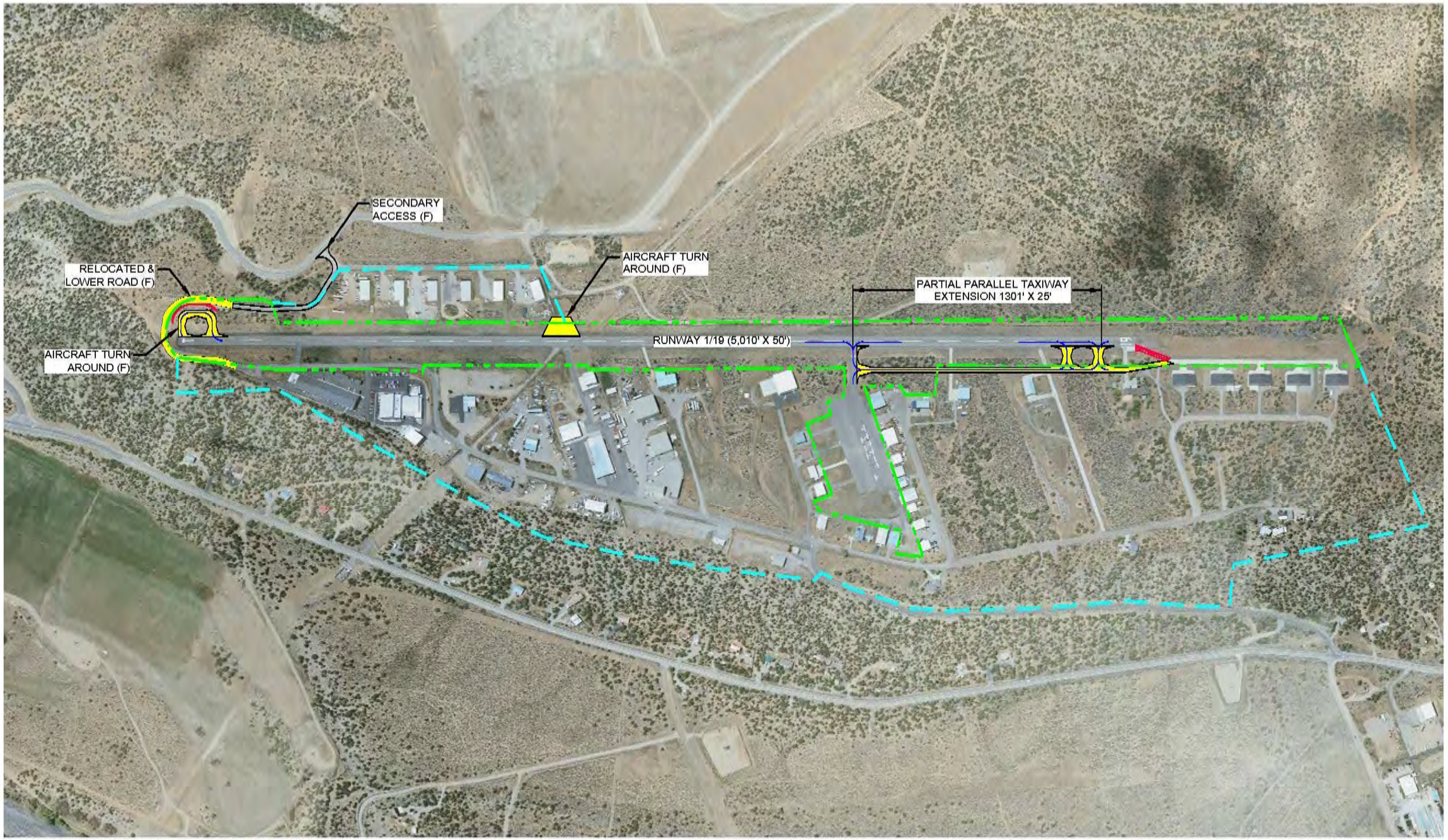
DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

FIGURE 4-1

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	GWK	FILE:	6205603
CHK'D:	JMR	JOB NO.:	146205



TAXIWAY ALTERNATIVE II

EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE ASPHALT

TO BE REMOVED

260 0 260 600

SCALE IN FEET

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DURANGO, COLORADO

FIGURE 4-2

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	GMR	FILE:	6205604
CHK'D:	JMR	JOB NO.:	146205

EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE AIRPORT PROPERTY LINE

FUTURE ASPHALT

TO BE REMOVED

250 0 250 500

SCALE IN FEET

TAXIWAY ALTERNATIVE III

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DURANGO-ANIMAS AIRPARK
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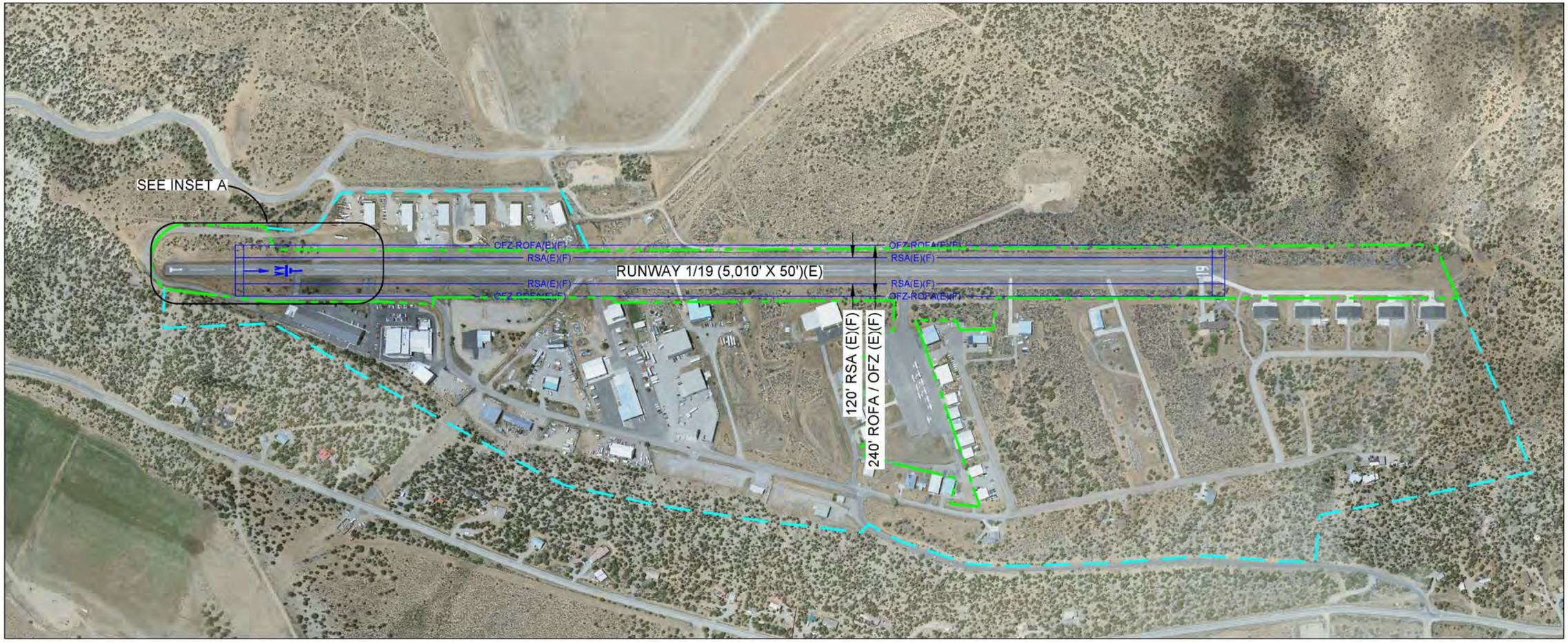
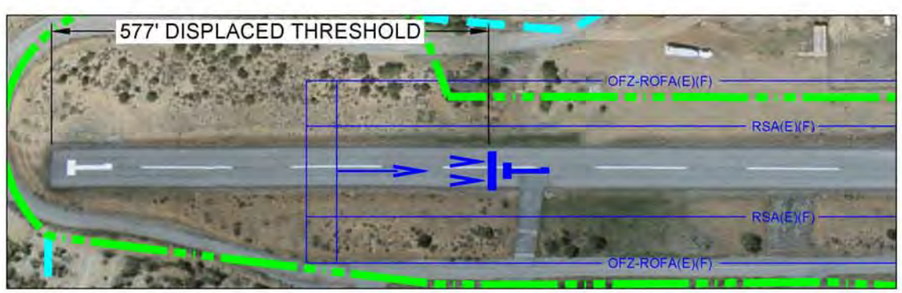
FIGURE 4-3

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	GWK	FILE:	6205605 FIG 4-3
CHK'D:	JMR	JOB NO.:	146205



AIRFIELD LAYOUT



INSET A

200 0 100 200

SCALE IN FEET

250 0 250 500

SCALE IN FEET

EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

NON-STANDARD CONDITION CORRECTION ALTERNATIVE I

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DURANGO-ANIMAS AIRPARK DURANGO, COLORADO			
FIGURE 4-4			
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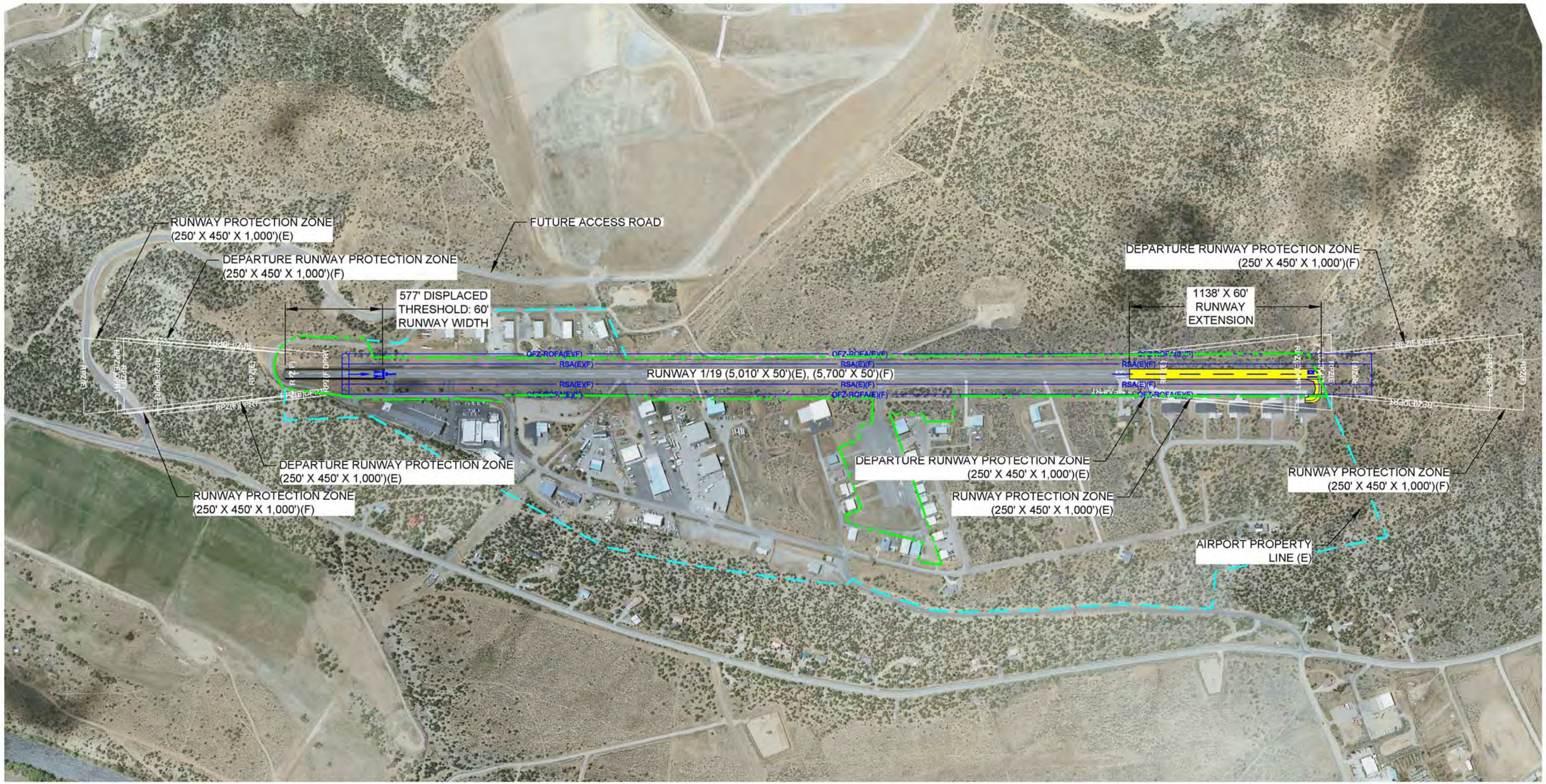
CHK'D:	JMR	JOB NO.	146205



EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE ASPHALT

300 0 300 600

SCALE IN FEET

NON-STANDARD CONDITION CORRECTION ALTERNATIVE II

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

FIGURE 4-5

SCALE:	PER BAR SCALE	DATE:	06/2015
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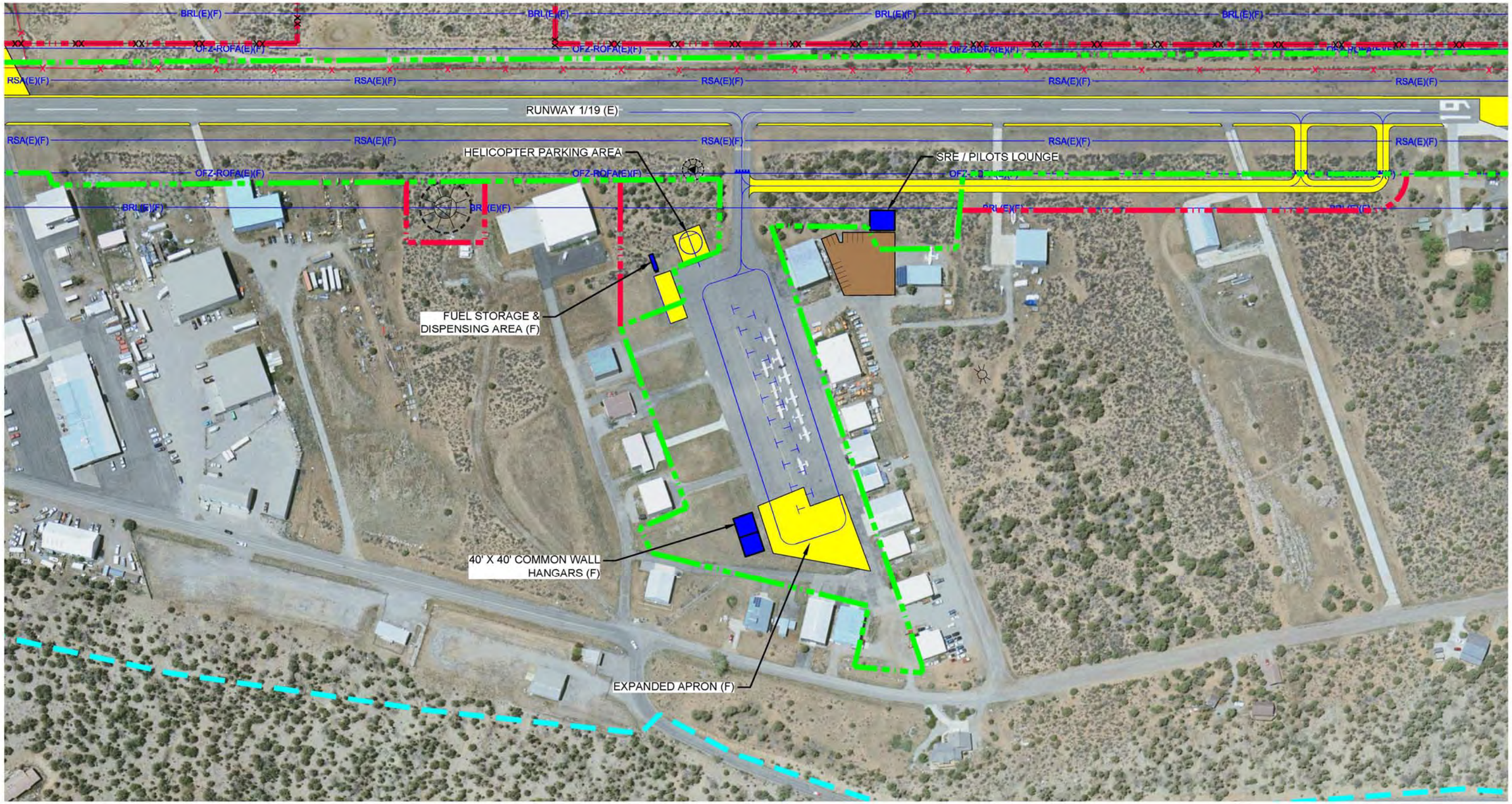

EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE AIRPORT PROPERTY LINE

FUTURE ASPHALT

FUTURE STRUCTURE

100 0 100 200

SCALE IN FEET

LANDSIDE DEVELOPMENT

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FIGURE 4-6

SCALE:	PER BAR SCALE	DATE:	06/2015
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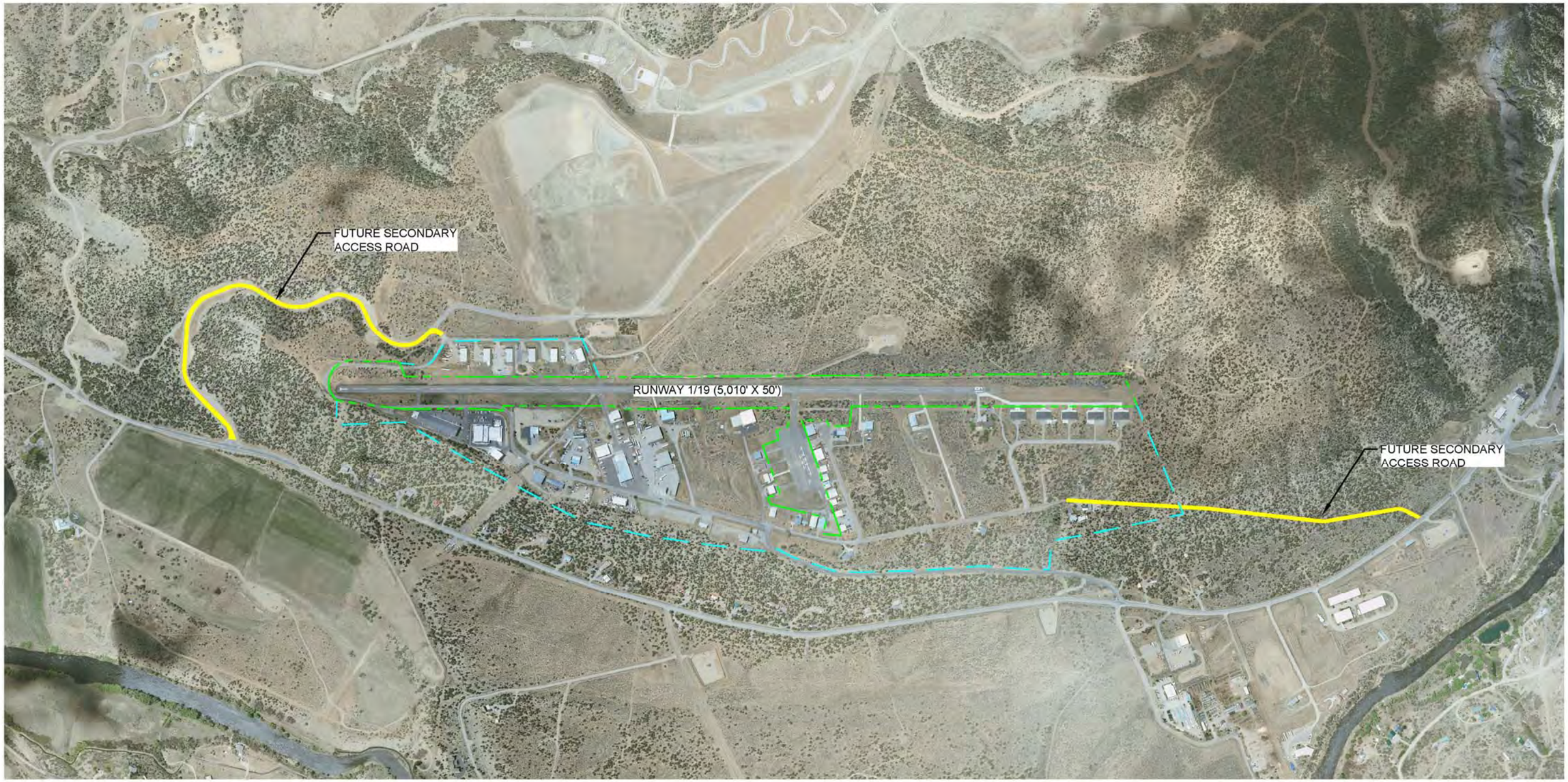
CHK'D:	JMR	JOB NO.:	146205



EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE ASPHALT

250 0 250 500

SCALE IN FEET

SECONDARY ACCESS ROAD ALTERNATIVES

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

FIGURE 4-7

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	GWK	FILE:	6205609
CHK'D:	JMR	JOB NO.:	146205

EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE SEWER SERVICE

FUTURE WILDLIFE FENCE / AIRPORT PROPERTY LINE (F)

250 0 250 500

SCALE IN FEET

MISCELLANEOUS FACILITIES DEVELOPMENT PLAN

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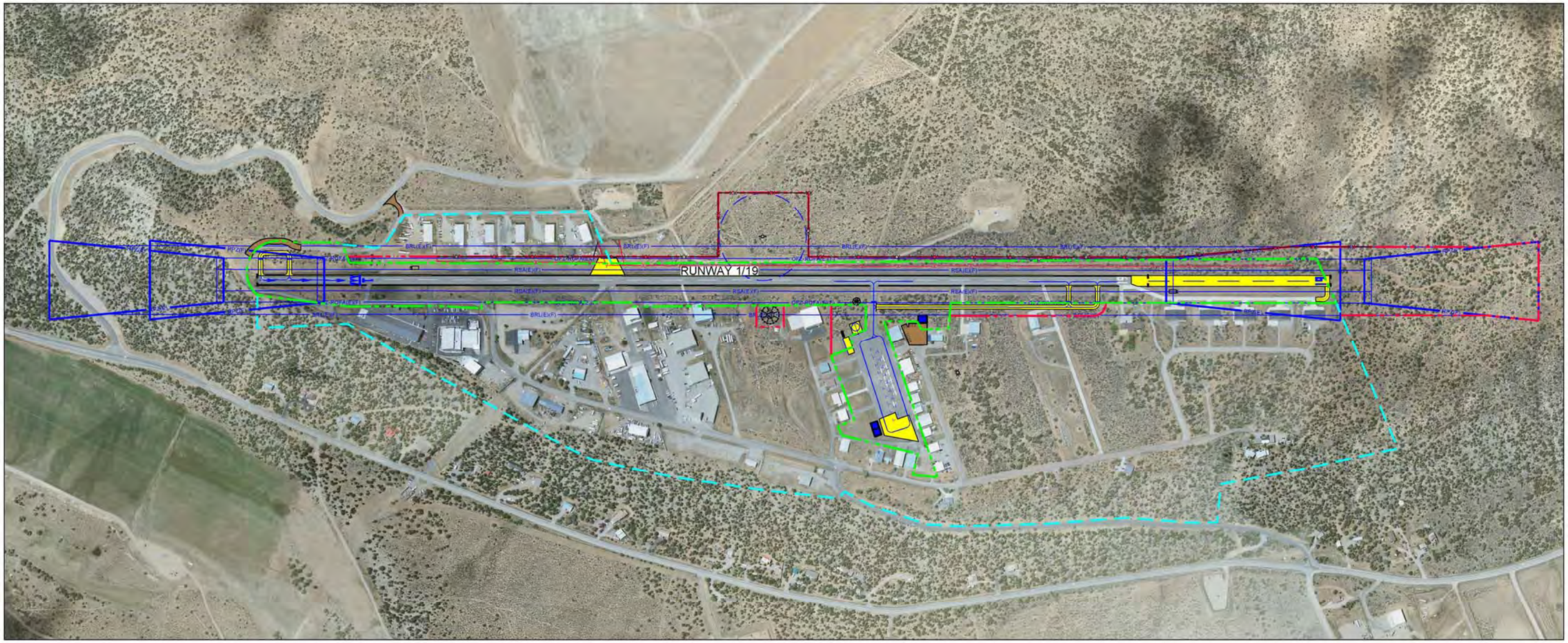
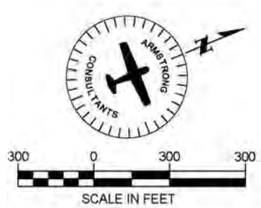
DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

FIGURE 4-8

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	GMR	FILE:	6205610
CHK'D:	JMR	JOB NO.	146205



AIRFIELD LAYOUT



EXISTING AIRPARK BOUNDARY

EXISTING AIRPORT PROPERTY LINE

FUTURE AIRPORT PROPERTY LINE

FUTURE ASPHALT

FUTURE STRUCTURE

RECOMMENDED DEVELOPMENT

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

FIGURE 4-9

SCALE:	PER BAR SCALE	DATE:	06/2015
DRAWN:	LKB	FILE:	6205612
CHK'D:	JMR	JOB NO.:	146205

CHAPTER FIVE

AIRPORT LAYOUT PLAN

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

DURANGO-ANIMAS AIRPARK

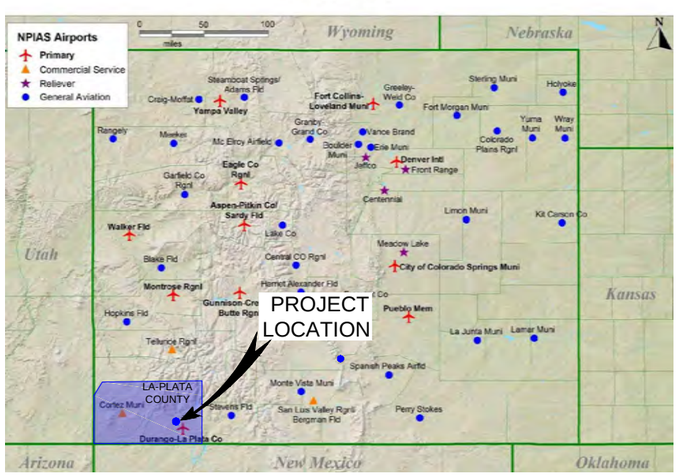
DURANGO, COLORADO

AIRPORT LAYOUT PLAN

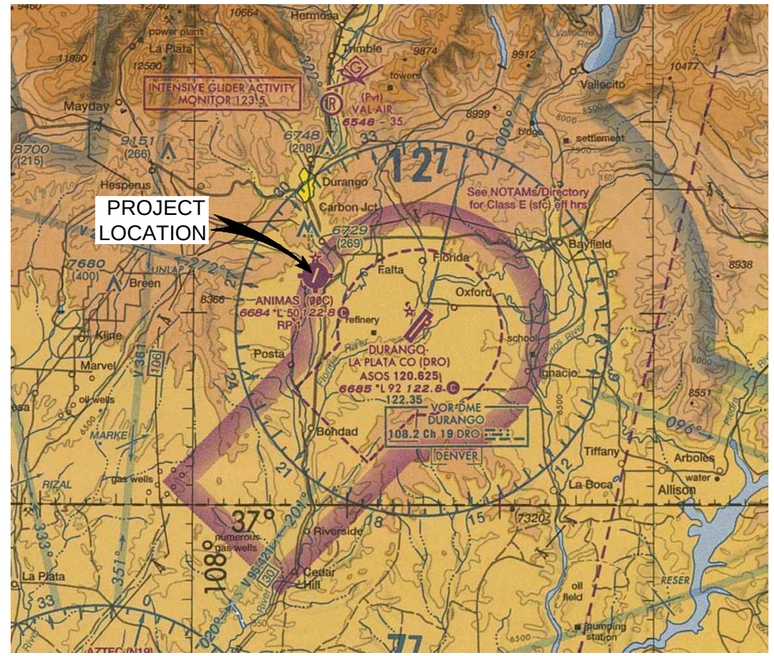
PREPARED BY:

ARMSTRONG CONSULTANTS, INC.

C.D.O.T. No. 14-00C-01
ACI PROJECT No. 146205
DATE: SEPTEMBER, 2015



LOCATION MAP



VICINITY MAP

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No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	146205	09/2015	ORIGINAL ISSUE	6205501	LKB	JMR	JZP

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6205501

AIRPORT FACILITIES LIST

NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL)	NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL)
1	FBO	** 6681'	37	BUILDING	** 6668'
2	BUILDING	** 6670'	38	BUILDING	** 6648'
3	BUILDING	** 6660'	39	BUILDING	** 6653'
4	BUILDING	** 6665'	40	BUILDING	** 6662'
5	BUILDING	** 6669'	41	BUILDING	** 6662'
6	BUILDING	** 6662'	42	BUILDING	** 6645'
7	BUILDING	** 6664'	43	BUILDING	** 6646'
8	BUILDING	** 6660'	44	BUILDING	** 6653'
9	BUILDING	** 6672'	45	BUILDING	** 6658'
10	BUILDING	** 6670'	46	BUILDING	** 6659'
11	BUILDING	** 6666'	47	BUILDING	** 6646'
12	BUILDING	** 6665'	48	BUILDING	** 6664'
13	BUILDING	** 6664'	49	BUILDING	** 6697'
14	BUILDING	** 6672'	50	BUILDING	** 6696'
15	BUILDING	** 6666'	51	BUILDING	** 6705'
16	BUILDING	** 6669'	52	BUILDING	** 6708'
17	BUILDING	** 6666'	53	BUILDING	** 6710'
18	BUILDING	** 6676'	54	BUILDING	** 6708'
19	BUILDING	** 6678'	55	BUILDING	** 6708'
20	BUILDING	** 6676'	56	PAPI's	-
21	BUILDING	** 6678'	57	LIGHTED WIND CONE / SEGMENTED CIRCLE	* 6690'
22	SRE/PILOTS LOUNGE	* 6699'			
23	BUILDING	* 6672'	58	AIRCRAFT TIEDOWNS	-
24	HELICOPTER PARKING	-	59	VEHICLE PARKING	-
25	FUEL SYSTEM	* 6670'	60	AIRPORT BEACON	* 6707'
26	BUILDING	** 6654'	61	AWOS	* 6688'
27	BUILDING	** 6655'	62	BUILDING	* 6655'
28	BUILDING	** 6662	63	BUILDING	* 6654'
29	BUILDING	** 6653	64	BUILDING	* 6653'
30	BUILDING	** 6654'	65	BUILDING	* 6657'
31	BUILDING	** 6654'	66	BUILDING	* 6668'
32	BUILDING	** 6657'	67	BUILDING	* 6666'
33	BUILDING	** 6659'	68	BUILDING	* 6670'
34	BUILDING	** 6664'	69	BUILDING	* 6681'
35	BUILDING	** 6662"	70	BUILDING	* 6683'
36	BUILDING	** 6665'	71	BUILDING	* 6683'
			72	BUILDING	* 6675'

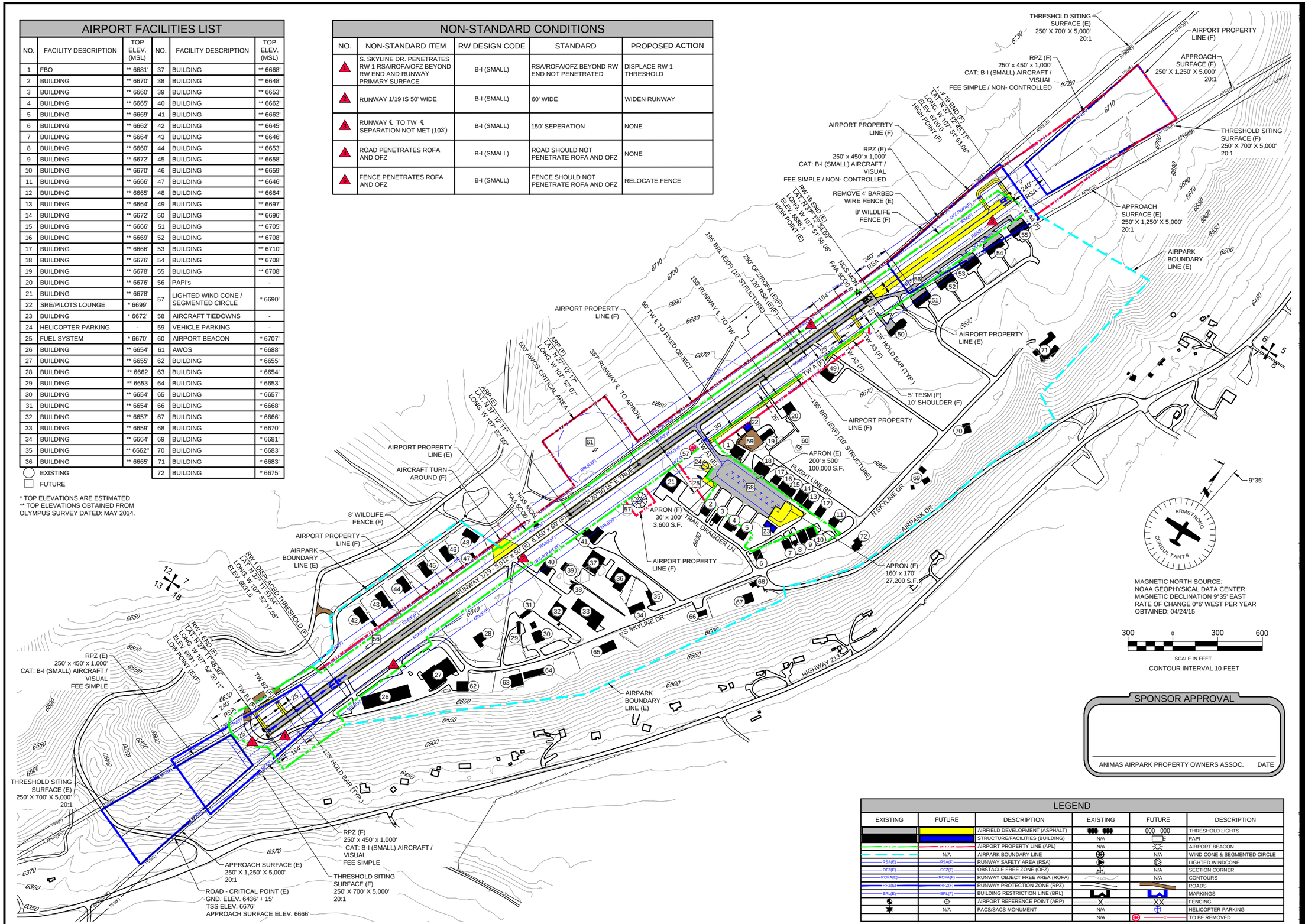
EXISTING

FUTURE

* TOP ELEVATIONS ARE ESTIMATED
** TOP ELEVATIONS OBTAINED FROM OLYMPUS SURVEY DATED: MAY 2014.

NON-STANDARD CONDITIONS

NO.	NON-STANDARD ITEM	RW DESIGN CODE	STANDARD	PROPOSED ACTION
1	S. SKYLINE DR. PENETRATES RW 1 RSA/ROFA/OFZ BEYOND RW END AND RUNWAY PRIMARY SURFACE	B-I (SMALL)	RSA/ROFA/OFZ BEYOND RW END NOT PENETRATED	DISPLACE RW 1 THRESHOLD
2	RUNWAY 1/19 IS 50' WIDE	B-I (SMALL)	60' WIDE	WIDEN RUNWAY
3	RUNWAY ℄ TO TW ℄ SEPARATION NOT MET (103')	B-I (SMALL)	150' SEPERATION	NONE
4	ROAD PENETRATES ROFA AND OFZ	B-I (SMALL)	ROAD SHOULD NOT PENETRATE ROFA AND OFZ	NONE
5	FENCE PENETRATES ROFA AND OFZ	B-I (SMALL)	FENCE SHOULD NOT PENETRATE ROFA AND OFZ	RELOCATE FENCE



SPONSOR APPROVAL

ANIMAS AIRPARK PROPERTY OWNERS ASSOC. DATE

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)	N/A		PAPI
		AIRPORT PROPERTY LINE (APL)	N/A		AIRPORT BEACON
	N/A	AIRPARK BOUNDARY LINE		N/A	WIND CONE & SEGMENTED CIRCLE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			LIGHTED WINDCONE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)		N/A	SECTION CORNER
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)		N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROADS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
	N/A	PACS/SACS MONUMENT	N/A		HELICOPTER PARKING
			N/A		TO BE REMOVED

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

C.D.O.T. No. 14-00C-01
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Dwvn.	Chkd.	Apprvd
5							
4							
3							
2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620502	LKB	JMR	JZP

AIRPORT LAYOUT PLAN

RUNWAY DATA

ITEM		RW 1/19 - EXISTING (E)		RW 1/19 - FUTURE (F)	
RUNWAY IDENTIFICATION		1	19	1	19
RUNWAY DESIGN CODE (RDC) / RUNWAY VISUAL RANGE (RVR)		B-I(SMALL)-VIS		B-I(SMALL)-VIS	
DEPARTURE REFERENCE CODE (DPRC)		B-I(SMALL)-VIS		B-I(SMALL)-VIS	
SURFACE MATERIAL, PAVEMENT STRENGTH & MATERIAL TYPE	SURFACE MATERIAL	ASPHALT		ASPHALT	
	STRENGTH BY WHEEL LOADING (LBS)	UNPUBLISHED		12,500 SWG	
	SURFACE TREATMENT	NONE		NONE	
RUNWAY GRADIENT	EFFECTIVE (%)	1.14		1.12	
	MAXIMUM (%)	1.62		1.62	
	LINE OF SIGHT MET (Y OR N)	YES		YES	
PERCENT WIND COVERAGE	10.5 KTS	91.84%		TBD	
	13 KTS	95.18%		TBD	
	16 KTS	98.01%		TBD	
RUNWAY DIMENSIONS (FT)		5,012 X 50		6,150 X 60	
RUNWAY SAFETY AREA (RSA)	WIDTH (FT)	120		120	
	LENGTH BEYOND RUNWAY END (FT)	240	240	240	240
RUNWAY COORDINATES (NAD 83)	RUNWAY END LATITUDE	N 37°11'48.30"	N 37°12'34.58"	N 37°11'48.30"	N 37°12'45.11"
	RUNWAY END LONGITUDE	W 107°52'20.11"	W 107°51'58.09"	W 107°52'20.11"	W 107°51'53.08"
	DISPLACED THRESHOLD LAT.	N/A	N/A	N 37°11'53.64"	N/A
	DISPLACED THRESHOLD LONG.	N/A	N/A	W 107°52'17.58"	N/A
RUNWAY ELEVATIONS (NAVD 88)	RUNWAY END (FT)	6631.1	6688.1	6631.1	6700.0
	DISPLACED THRESHOLD (FT)	N/A	N/A	6631.6	N/A
	TOUCHDOWN ZONE (TDZ) (FT)	N/A	N/A	N/A	N/A
	HIGH POINT (FT)	6688.1		6700.0	
	LOW POINT (FT)	6631.1		6631.1	
RUNWAY LIGHTING TYPE		MIRL		MIRL	
RUNWAY PROTECTION ZONE (RPZ) (FT)		250 X 450 X 1,000	250 X 450 X 1,000	250 X 450 X 1,000	250 X 450 X 1,000
RUNWAY MARKING TYPE		VISUAL	VISUAL	VISUAL	VISUAL
14 CFR PART 77 APPROACH SURFACES	APPROACH TYPE	VISUAL	VISUAL	VISUAL	VISUAL
	VISIBILITY MINIMUMS (FT)	VISUAL	VISUAL	VISUAL	VISUAL
	APPROACH SLOPE DIMENSIONS (FT)	250 X 1,250 X 5,000	250 X 1,250 X 5,000	250 X 1,250 X 5,000	250 X 1,250 X 5,000
	APPROACH CATEGORY (SLOPE)	20:1	20:1	20:1	20:1
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH		NONE		NONE	
RUNWAY DEPARTURE SURFACE (YES OR N/A)		N/A	N/A	N/A	N/A
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH (FT)	250		250	
	LENGTH BEYOND RUNWAY END (FT)	240	240	240	240
OBSTACLE FREE ZONE (OFZ)	WIDTH (FT)	250		250	
	LENGTH BEYOND RUNWAY END (FT)	200	200	200	200
THRESHOLD SITING SURFACE (TSS)	DIMENSIONS (FT)	250 X 700 X 5,000	250 X 700 X 5,000	250 X 700 X 5,000	250 X 700 X 5,000
	SLOPE	20:1	20:1	20:1	20:1
	PENETRATIONS	YES	YES	NONE	NONE
VISUAL AND INSTRUMENT NAVAIDS		NONE	NONE	PAPI	PAPI

TAXIWAY AND TAXILANE DIMENSIONS

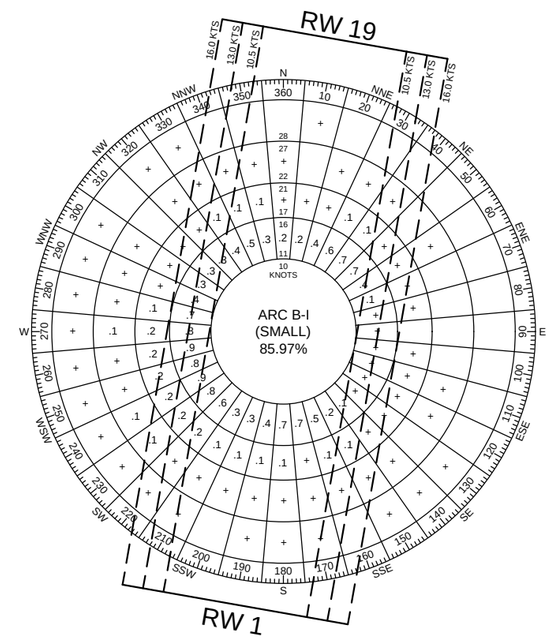
TAXIWAYS AND TAXLINES	EXISTING (ALL)	FUTURE (ALL)
TAXIWAY AND TAXILANE DESIGN GROUP (TDG)	1A	1A
TAXIWAY AND TAXILANE WIDTH (FT)	30	25
TAXIWAY AND TAXILANE SAFETY AREA (FT)	49	49
TAXIWAY AND TAXILANE OBJECT FREE AREA (FT)	TW: 89, TL:79	TW: 89, TL:79
TAXIWAY AND TAXILANE SEPARATION (FT)	TW:70, TL:64	TW:70, TL:64
TAXIWAY AND TAXILANE LIGHTING	NONE	NONE

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (DAD 83); VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88).
EXISTING ELEVATIONS & RUNWAY END COORDINATES OBTAINED FROM OLYMPUS SURVEY DATA DATED 04/2014.

AIRPORT DATA

ITEM		EXISTING (E)	FUTURE (F)
AIRPORT REFERENCE CODE (ARC)		B-I (SMALL)	B-I (SMALL)
MEAN MAX. TEMP OF HOTTEST MONTH (°F) (JULY)		96	TBD
AIRPORT ELEVATION (MSL, FT) (NAVD 88) *		6688.1	6700.0
AIRPORT NAVIGATIONAL AIDS		NONE	PAPI/BEACON
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	N 37°12'11"	N 37°12'17"
	LONGITUDE	W 107°52'09"	W 107°52'07"
MISCELLANEOUS FACILITIES		SEGMENTED CIRCLE	SEGMENTED CIRCLE, AWOS, PILOT LOUNGE
ARC AND CRITICAL AIRCRAFT	ARC	B-I (SMALL)	B-I (SMALL)
	AIRCRAFT	CESSNA 402C	CESSNA 402C
	WINGSPAN (FT)	44	44
	MAIN GEAR WIDTH (MGW)(FT)	17	17
	APPROACH SPEED (KTS)	92	92
AIRPORT MAGNETIC VARIATION	VARIATION	9° 35'	TBD
	DATE	4/24/2015	TBD
	SOURCE	NOAA	TBD

* ELEVATIONS OBTAINED FROM OLYMPUS SURVEY DATA DATED 04/2014.



DECLARED DISTANCES

ITEM	EXISTING		FUTURE	
	RW 1	RW 19	RW 1	RW 19
TAKEOFF RUN AVAILABLE (TORA) (FT)	5,010	5,010	6,150	6,150
TAKEOFF DISTANCE AVAILABLE (TODA) (FT)	5,010	5,010	6,150	5,573
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) (FT)	5,010	5,010	6,150	5,573
LANDING DISTANCE AVAILABLE (LDA) (FT)	5,010	5,010	5,573	5,573

WIND ROSE DATA

RUNWAY	VISIBILITY MINIMUMS	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 1/19	VISUAL	91.84%	95.18%	98.01%

ALL WEATHER WIND ROSE

OBSERVATIONS: 99,916 BETWEEN JULY 2006 AND JULY 2014
SOURCE: DURANGO-LA PLATA COUNTY AIRPORT ASOS

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

C.D.O.T. No. 14-00C-01
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	146205	09/2015	INITIAL ALP	620502	LKB	JMR	JZP
1							
2							
3							
4							
5							

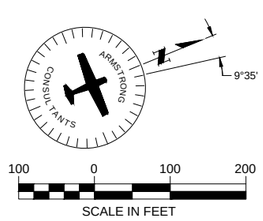
AIRPORT DATA SHEET

AIRPORT FACILITIES LIST		
NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL)
1	FBO	** 6681'
2	BUILDING	** 6670'
3	BUILDING	** 6660'
4	BUILDING	** 6665'
5	BUILDING	** 6669'
6	BUILDING	** 6662'
7	BUILDING	** 6664'
8	BUILDING	** 6660'
9	BUILDING	** 6672'
10	BUILDING	** 6670'
11	BUILDING	** 6666'
12	BUILDING	** 6665'
13	BUILDING	** 6664'
14	BUILDING	** 6672'
15	BUILDING	** 6666'
16	BUILDING	** 6669'
17	BUILDING	** 6666'
18	BUILDING	** 6676'
19	BUILDING	** 6678'
20	BUILDING	** 6676'
21	BUILDING	** 6678'
22	SRE/PILOTS LOUNGE	* 6699'
23	BUILDING	* 6672'
24	HELICOPTER PARKING	-
25	FUEL SYSTEM	* 6670'
26	VEHICLE PARKING	-
27	AIRPORT BEACON	* 6707'
28	BUILDING	* 6666'
29	BUILDING	* 6670'
30	BUILDING	* 6675'
31	LIGHTED WIND CONE / SEGMENTED CIRCLE	* 6690'

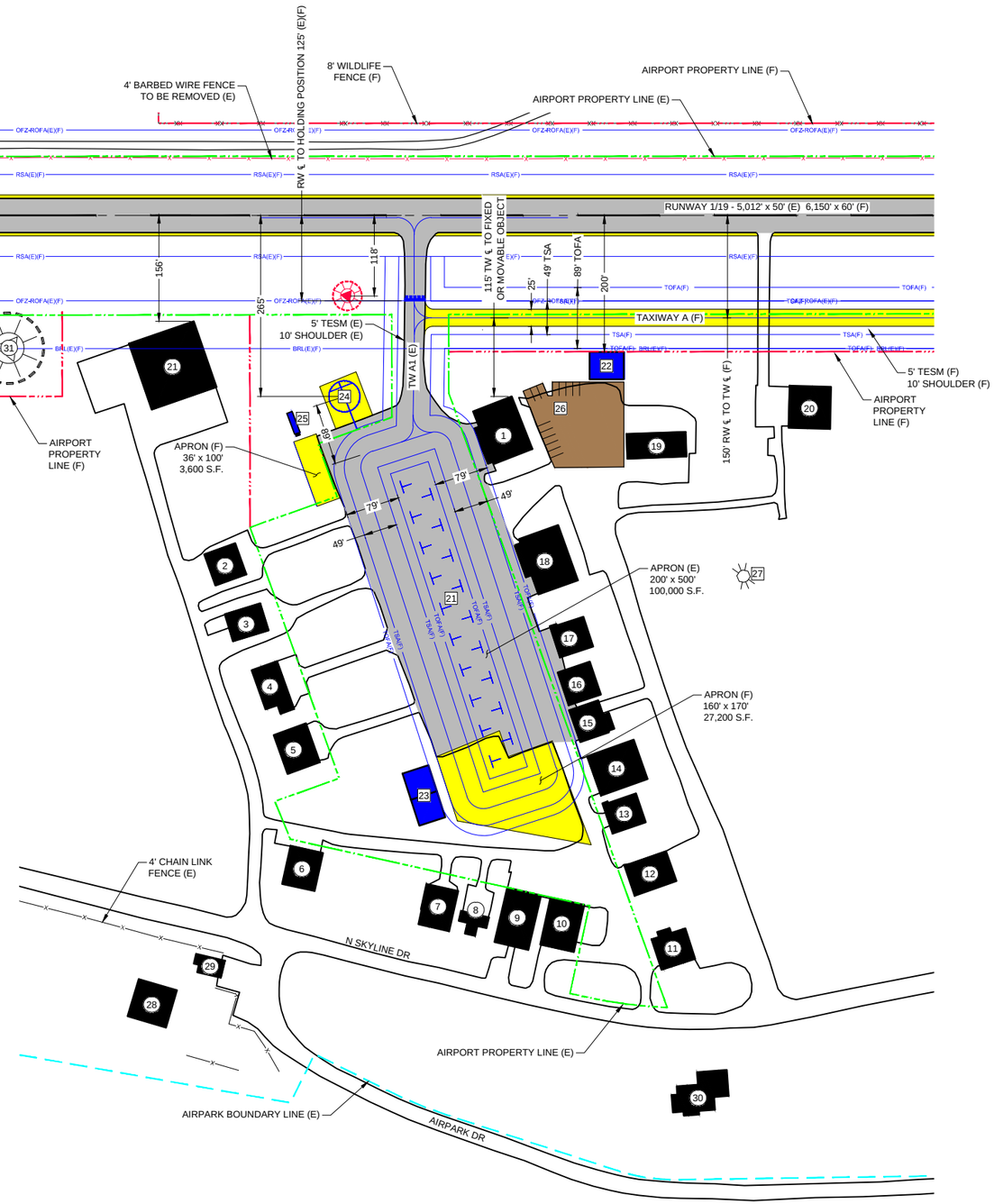
EXISTING

FUTURE

* TOP ELEVATIONS ARE ESTIMATED
** TOP ELEVATIONS OBTAINED FROM OLYMPUS SURVEY DATED: MAY 2014.



LEGEND					
EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
		STRUCTURE/FACILITIES (BUILDING)	X	XX	FENCING
		AIRPORT PROPERTY LINE (APL)	N/A		AIRPORT BEACON
	N/A	AIRPARK BOUNDARY LINE		N/A	WIND CONE & SEGMENTED CIRCLE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			ROADS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			MARKINGS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	N/A		HELICOPTER PARKING
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	N/A		TO BE REMOVED
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			



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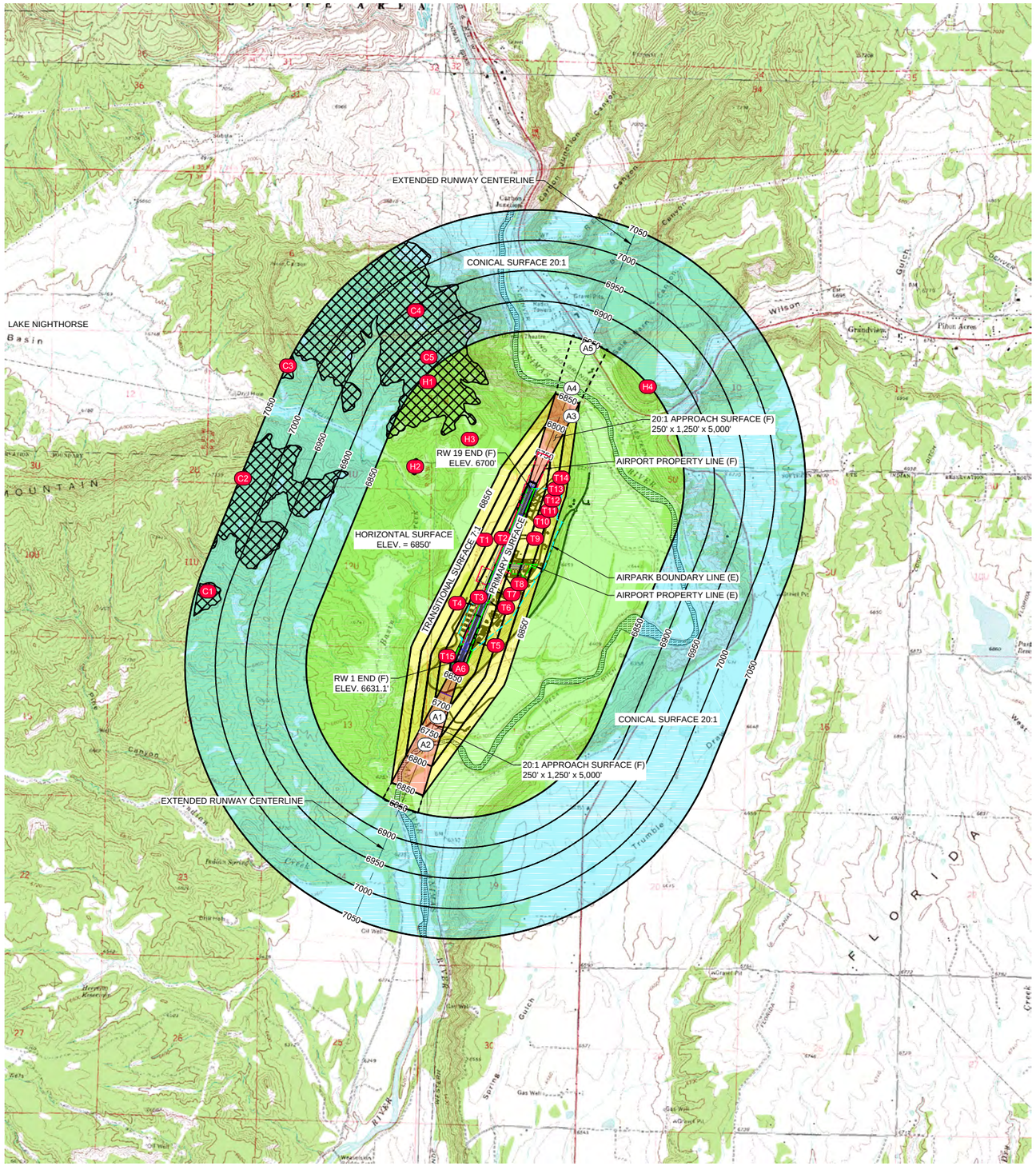
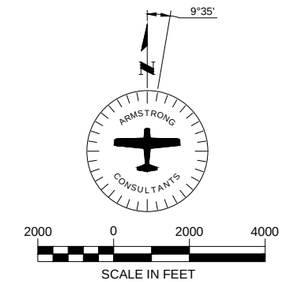
No.	Project No.	Date	Revision / Description	File	Drwn.	Ckd.	Apprvd
5							
4							
3							
2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620503	LKB	JMR	JZP

TERMINAL AREA DRAWING

Sheet: 4 of: 14





LEGEND

- HORIZONTAL SURFACE
- CONICAL SURFACE
- PRIMARY SURFACE
- TRANSITIONAL SURFACE
- APPROACH SURFACE
- TERRAIN PENETRATION
- WATER

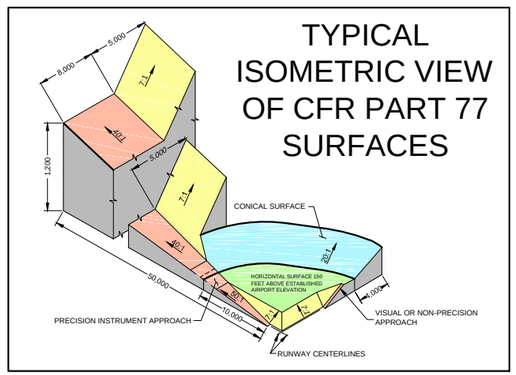
NOTES

A) REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWINGS FOR DETAILS ON ANY CLOSE-IN APPROACH OBSTRUCTIONS.

B) 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.) 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 OR GREATER IN HEIGHT THAN 200 FEET ABOVE GROUND LEVEL. https://oeaaa.faa.gov/oeaaa/external/portal.jsp

C) APPROACH SURFACES BASED ON ULTIMATE CONDITION.

D) OBSTRUCTION INFORMATION WAS DETERMINED USING PREVIOUS OBSTRUCTION SURVEY INFORMATION AND AN INQUIRY OF THE FAA OE/AAA DATABASE.



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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

C.D.O.T. No. 14-00C-01
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Dwn.	Chkd.	Apprvd
5							
4							
3							
2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620504	LKB	JMR	JZP

14 CFR PART "77" AIR SPACE DRAWING

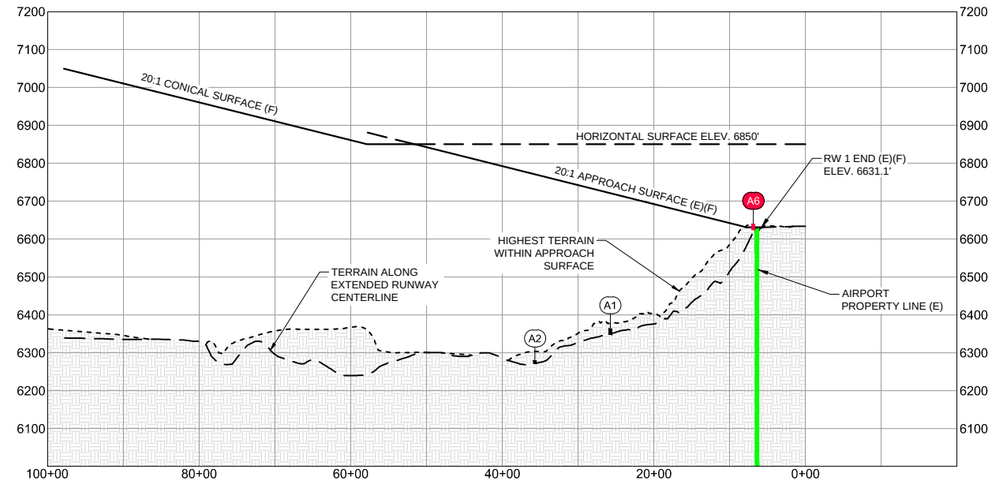
Sheet: 5 of: 14

OBSTRUCTION CHART

PART 77 SURFACE	ITEM No.	DESCRIPTION	GROUND ELEVATION (MSL)(FEET)	ESTIMATED TOP ELEVATION (MSL)(FEET)	PENETRATION (FEET)	REMARKS
PRIMARY	-	-	-	-	-	-
APPROACH	A1	* ROAD	6348	6363	NONE	-
	A2	* RIVER	6272	6287	NONE	-
	A3	* ROAD	6418	6433	NONE	-
	A4	* RIVER	6360	6360	NONE	-
	A5	* HIGHWAY	6465	6480	NONE	-
	A6	** ROAD	6624	6639	+8	SEE NOTE 1
7:1 TRANSITIONAL	T1	*** TEMP. DRILLING RIG	6695	6772	+32	SEE NOTE 1
	T2	*** WORK OVER RIG	6676	6692	+95	SEE NOTE 1
	T3	** BUILDING	6647	6659	+207	SEE NOTE 1
	T4	** BUILDING	6645	6662	+2	SEE NOTE 1
	T5	** BUILDING	6635	6643	+11	SEE NOTE 1
	T6	** BUILDING	6641	6658	+4	SEE NOTE 1
	T7	** BUILDING	6646	6659	+3	SEE NOTE 1
	T8	** BUILDING	6654	6672	+5	SEE NOTE 1
	T9	** BUILDING	6673	6689	+8	SEE NOTE 1
	T10	** BUILDING	6687	6696	+9	SEE NOTE 1
	T11	** BUILDING	6688	6697	+11	SEE NOTE 1
	T12	** BUILDING	6688	6701	+9	SEE NOTE 1
	T13	** BUILDING	6688	6701	+7	SEE NOTE 1
	T14	** BUILDING	6688	6704	+4	SEE NOTE 1
	T14	** ROAD	6636	6651	+9	SEE NOTE 1
HORIZONTAL	H1	* TERRAIN	7200	6850	+350	SEE NOTE 1
	H2	* TERRAIN	6891	6850	+42	SEE NOTE 1
	H3	*** WORK OVER RIG	6803	6850	+79	SEE NOTE 1
	H4	*** ANTENNA	6739	6850	+29	SEE NOTE 1
20:1 CONICAL	C1	* TERRAIN	7170	7034	+136	SEE NOTE 1
	C2	* TERRAIN	7462	7045	+417	SEE NOTE 1
	C3	* TERRAIN	7151	7048	+103	SEE NOTE 1
	C4	* TERRAIN	7557	6943	+614	SEE NOTE 1
	C5	*** TEMP. DRILLING RIG	6994	6869	+194	SEE NOTE 1

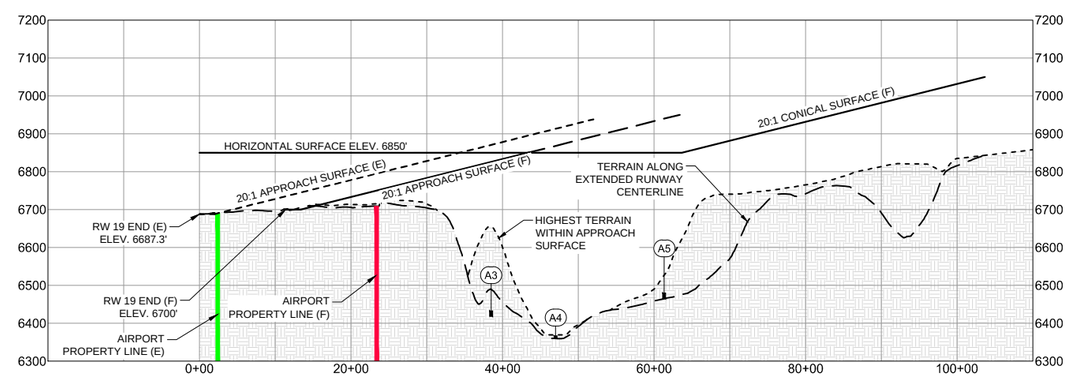
NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.
2. SEE INNER APPROACH DRAWINGS FOR OBSTRUCTIONS IN RPZ.
3. * TERRAIN ELEVATION ESTIMATED.
4. ** ELEVATION FROM OBSTRUCTION SURVEY BY: OLYMPUS, DATED 04/2014.
5. *** ELEVATION FROM THE FAA OE/AAA DATABASE.
6. AIRPORT ELEVATION: 6850'



RUNWAY 1 END PROFILE (F)

SCALE: PER GRID



RUNWAY 19 END PROFILE (F)

SCALE: PER GRID

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

C.D.O.T. No. 14-00C-01
AIRPORT LAYOUT PLAN

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0	146205	09/2015	ORIGINAL ISSUE	620504	LKB	JMR	JZP
1							
2							
3							
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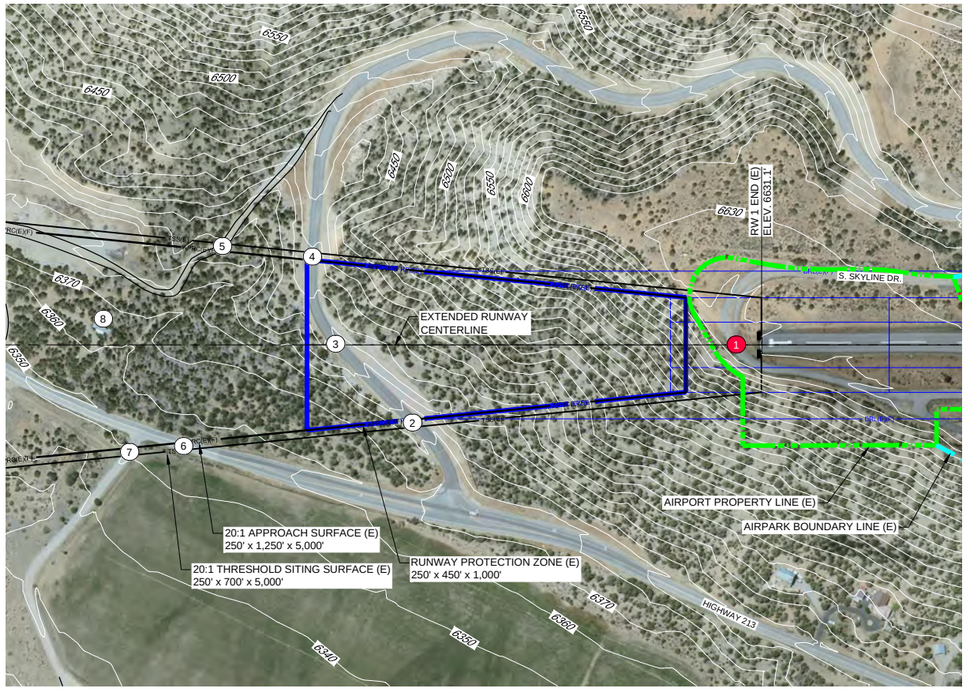
14 CFR PART "77" PROFILE DRAWING

Sheet: 6 of: 14



RUNWAY 1 END (E) PLAN

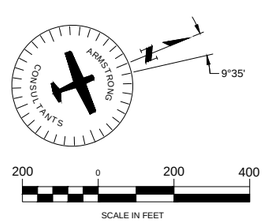
SCALE PER BAR SCALE

OBJECTS WITHIN RUNWAY 1 APRC AND TSS SURFACES (E)						
No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	ROAD	15'	6639'	+5'	+8'	DISPLACE THRESHOLD
2	ROAD	15'	6401'	NONE	NONE	N/A
3	ROAD	15'	6425'	NONE	NONE	N/A
4	ROAD	15'	6443'	NONE	NONE	N/A
5	ROAD	15'	6413'	NONE	NONE	N/A
6	ROAD	15'	6370'	NONE	NONE	N/A
7	ROAD	15'	6366'	NONE	NONE	N/A
8	BUILDING	12'	6376'	NONE	NONE	OBJECT HEIGHT EST.

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT GROUND ELEVATIONS ARE BASED ON A SURVEY BY: OLYMPUS, DATED: 04/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION;
N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE;
TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

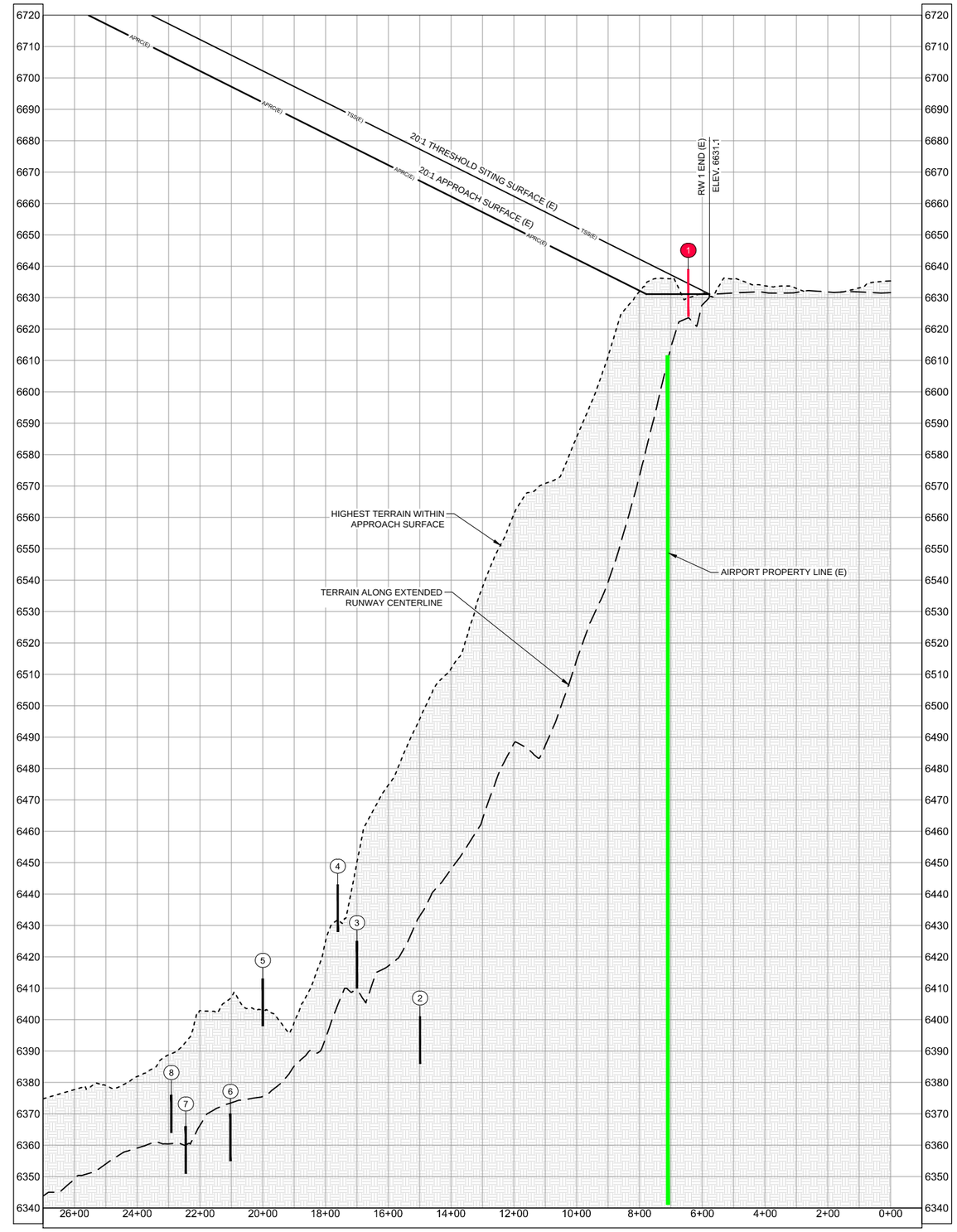
NOTES:

SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.



CONTOUR INTERVAL 10 FEET

LEGEND			
EXISTING	DESCRIPTION	EXISTING	DESCRIPTION
	AIRFIELD DEVELOPMENT (ASPHALT)	BRL(E)	BUILDING RESTRICTION LINE (BRL)
	STRUCTURE/FACILITIES (BUILDING)	APRC(E)	APPROACH SURFACE
	AIRPORT PROPERTY LINE (APL)	TSS(E)	THRESHOLD SITING SURFACE
	AIRPARK BOUNDARY LINE		THRESHOLD LIGHTS
RSA(E)	RUNWAY SAFETY AREA (RSA)	4125	CONTOURS
OFZ(E)	OBSTACLE FREE ZONE (OFZ)		ROAD
ROFA(E)	RUNWAY OBJECT FREE AREA (ROFA)		MARKINGS
RPZ(E)	RUNWAY PROTECTION ZONE (RPZ)	X	FENCE



RUNWAY 1 END (E) PROFILE

SCALE PER GRID

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5							
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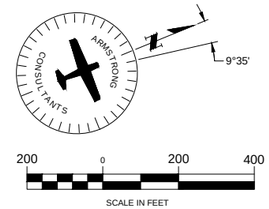
RUNWAY 1 INNER APPROACH (E)

RUNWAY 19 END (E) PLAN

SCALE PER BAR SCALE



CONTOUR INTERVAL 10 FEET

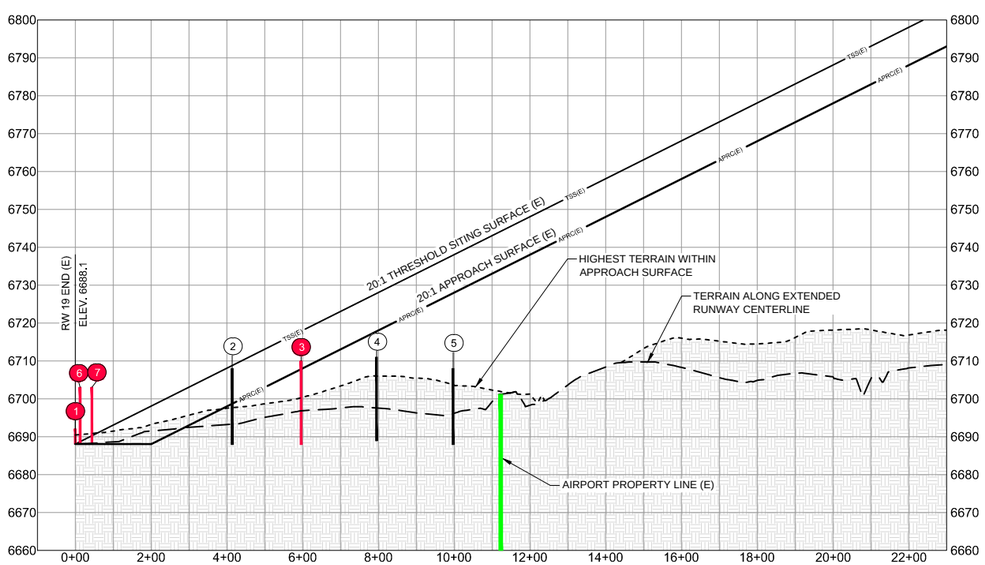
OBJECTS WITHIN RUNWAY 19 APRC AND TSS SURFACES (E)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	FENCE	4'	6693'	+4'	+4'	TOP ELEVATION EST. TO BE RELOCATED
2	BUILDING	20'	6708'	NONE	-	N/A
3	BUILDING	22'	6710'	NONE	+2'	O.L.
4	BUILDING	19'	6708'	NONE	NONE	N/A
5	BUILDING	20'	6708'	NONE	NONE	N/A
6	TREE	15'	6700'	+15'	+14'	TOP ELEVATION EST. TO BE REMOVED
7	TREE	15'	6700'	+15'	+14'	TOP ELEVATION EST. TO BE REMOVED

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT GROUND AND TOP ELEVATIONS ARE BASED ON A SURVEY BY: OLYMPUS, DATED: 04/2014. (UNLESS OTHERWISE NOTED IN REMARKS)
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.



RUNWAY 19 END (E) PROFILE

SCALE PER GRID

LEGEND

EXISTING	DESCRIPTION	EXISTING	DESCRIPTION
	AIRFIELD DEVELOPMENT (ASPHALT)	BRL(E)	BUILDING RESTRICTION LINE (BRL)
	STRUCTURE/FACILITIES (BUILDING)	APRC/(E)	APPROACH SURFACE
	AIRPORT PROPERTY LINE (APL)	TSS/(E)	THRESHOLD SITING SURFACE
	AIRPARK BOUNDARY LINE		THRESHOLD LIGHTS
RSA(E)	RUNWAY SAFETY AREA (RSA)	4125	CONTOURS
OFZ(E)	OBSTACLE FREE ZONE (OFZ)		ROAD
ROFA(E)	RUNWAY OBJECT FREE AREA (ROFA)		MARKINGS
RPZ(E)	RUNWAY PROTECTION ZONE (RPZ)	X	FENCE

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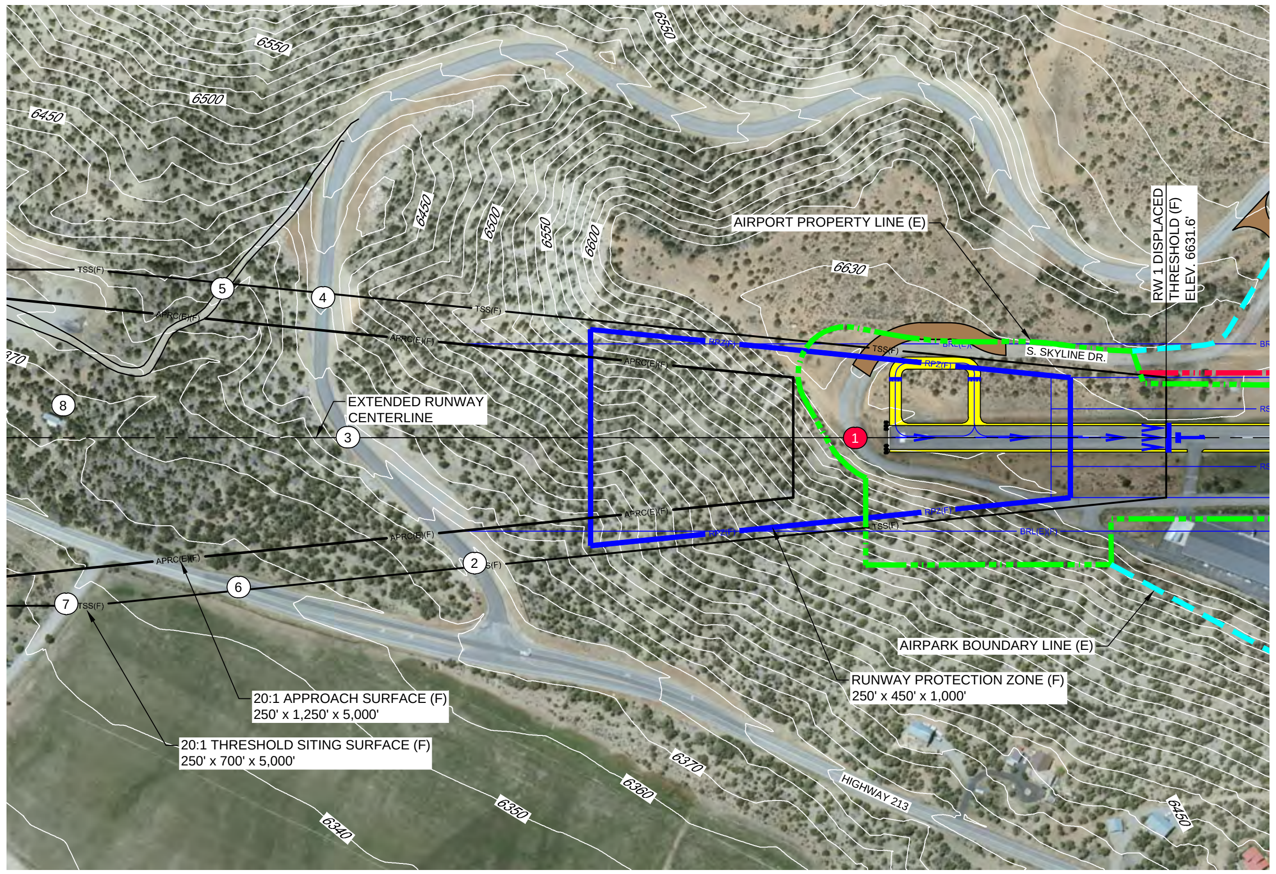
1							
0	146205	09/2015	ORIGINAL ISSUE	620505	LKB	JMR	JZP

RUNWAY 19
INNER
APPROACH
(E)



OBJECTS WITHIN RUNWAY 1 APRC AND TSS SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	ROAD	15'	6639'	NONE	+8'	N/A
2	ROAD	15'	6380'	NONE	NONE	N/A
3	ROAD	15'	6410'	NONE	NONE	N/A
4	ROAD	15'	6432'	NONE	NONE	N/A
5	ROAD	15'	6404'	NONE	NONE	N/A
6	ROAD	15'	6355'	NONE	NONE	N/A
7	ROAD	15'	6348'	NONE	NONE	N/A
8	BUILDING	12'	6364'	NONE	NONE	OBJECT HEIGHT EST.

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT GROUND ELEVATIONS ARE BASED ON A SURVEY BY: OLYMPUS, DATED: 04/2014.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
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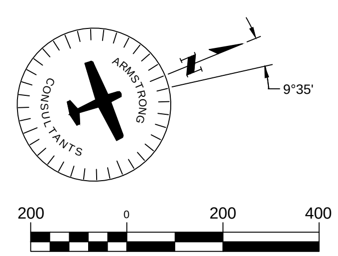
NOTES:

SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

RUNWAY 1 END (F) PLAN

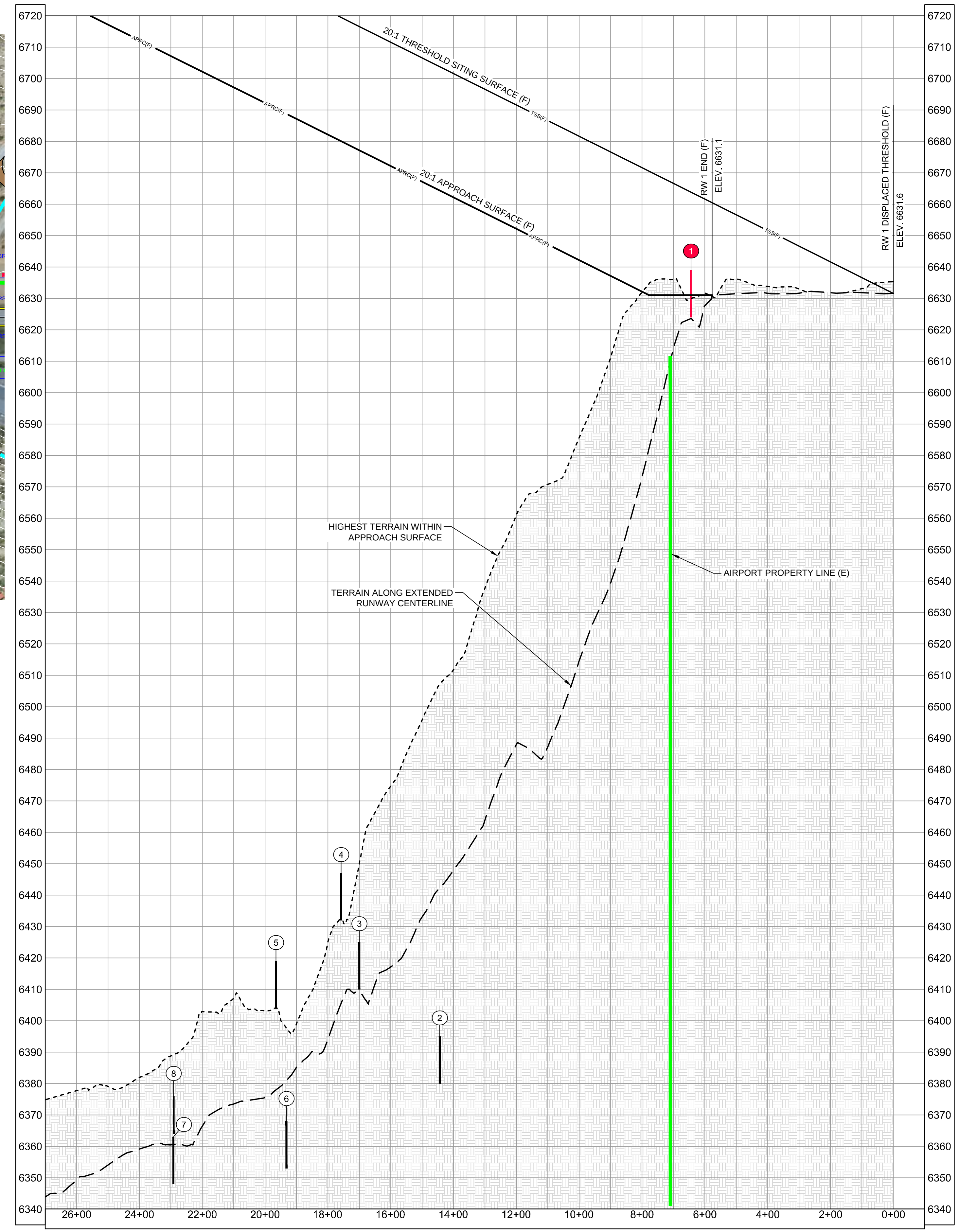
SCALE PER BAR SCALE



CONTOUR INTERVAL 10 FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
		STRUCTURE/FACILITIES (BUILDING)	APRC(E)	APRC(F)	APPROACH SURFACE
		AIRPORT PROPERTY LINE (APL)	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
	N/A	AIRPARK BOUNDARY LINE			THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			ROAD
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			MARKINGS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	X	XX	FENCE



RUNWAY 1 END (F) PROFILE

SCALE PER GRID

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RUNWAY 1 INNER APPROACH (F)

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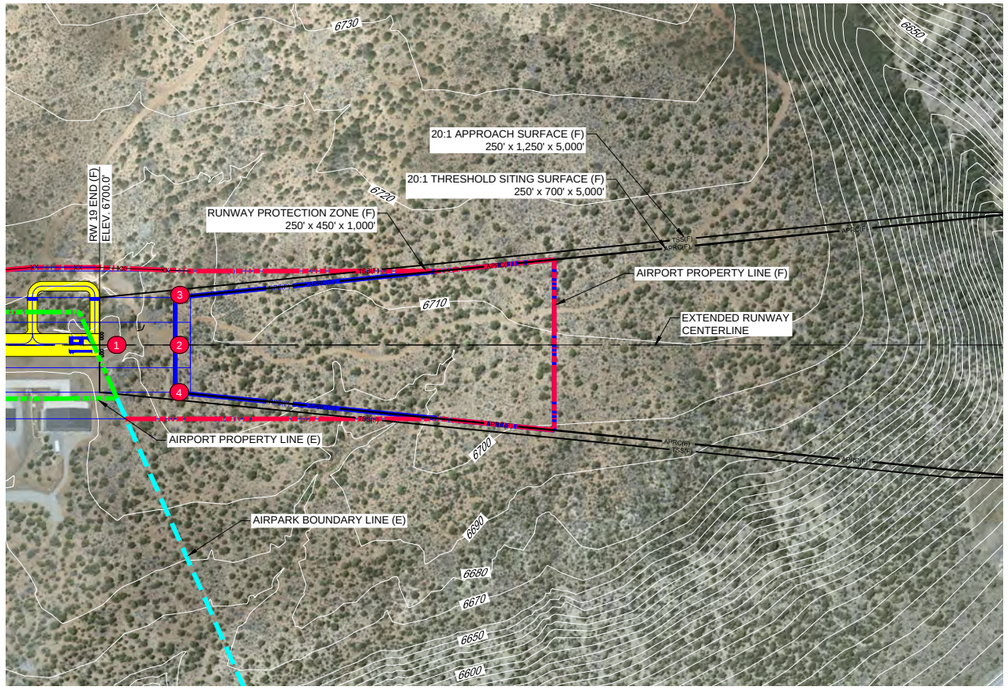
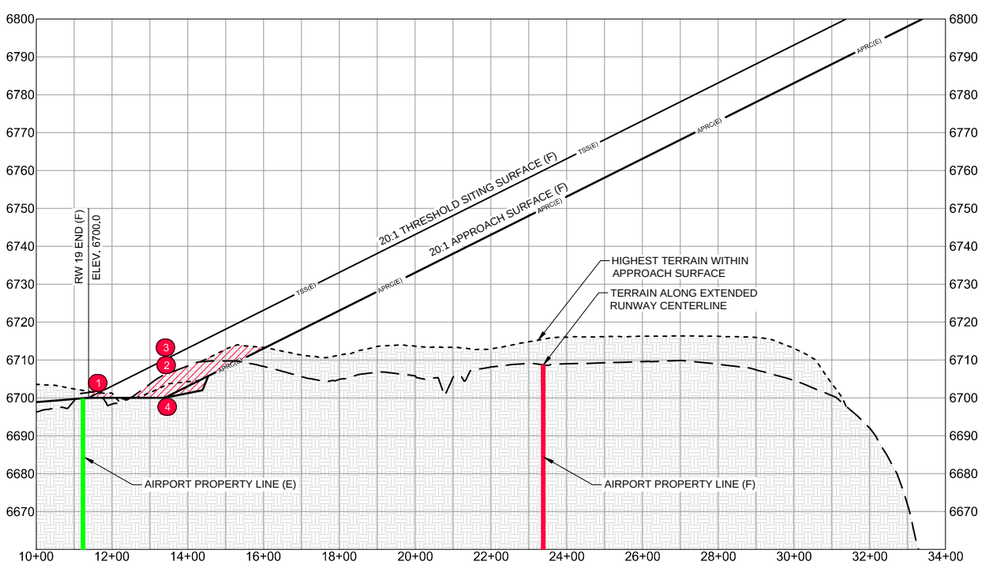


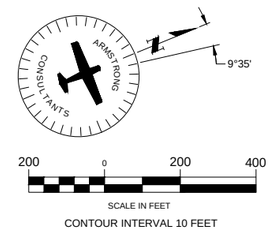
RUNWAY 19 END (F) PLAN

SCALE PER BAR SCALE



RUNWAY 19 END (F) PROFILE

SCALE PER GRID



CONTOUR INTERVAL 10 FEET

OBJECTS WITHIN RUNWAY 19 APRC AND TSS SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
1	TERRAIN	-	6699'	NONE	+2'	TO BE GRADED
2	TERRAIN	-	6710'	NONE	+6'	TO BE GRADED
3	TERRAIN	-	6701'	NONE	+6'	TO BE GRADED
4	TERRAIN	-	6701'	NONE	+4'	TO BE GRADED

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT GROUND ELEVATIONS ARE BASED ON A SURVEY BY: OLYMPUS, DATED: 04/2014.
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TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTES:

SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)	BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
		STRUCTURE/FACILITIES (BUILDING)	APRC(E)	APRC(F)	APPROACH SURFACE
		AIRPORT PROPERTY LINE (APL)	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
	N/A	AIRPARK BOUNDARY LINE			THRESHOLD LIGHTS
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)	4125	N/A	CONTOURS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			ROAD
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			MARKINGS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	X	XX	FENCE
					TERRAIN TO BE GRADED

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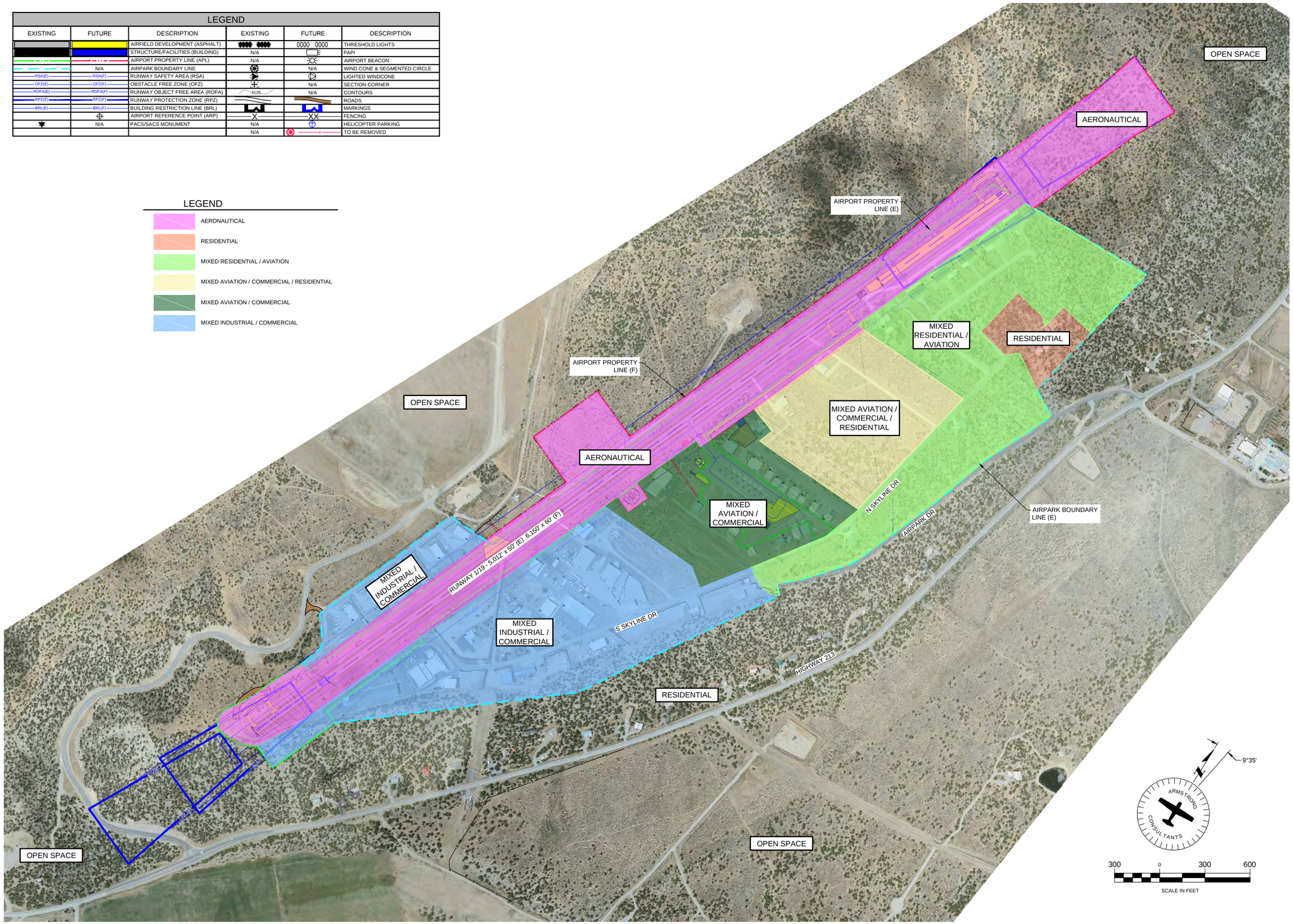
RUNWAY 19
INNER
APPROACH
(F)

LEGEND					
EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)	N/A		PAPI
		AIRPORT PROPERTY LINE (APL)	N/A		AIRPORT BEACON
N/A		AIRPARK BOUNDARY LINE		N/A	WIND CONE & SEGMENTED CIRCLE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			LIGHTED WINDCONE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)		N/A	SECTION CORNER
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4125	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROADS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
	N/A	PACS/SACS MONUMENT	N/A		HELICOPTER PARKING
			N/A		TO BE REMOVED

LEGEND

- AERONAUTICAL
- RESIDENTIAL
- MIXED RESIDENTIAL / AVIATION
- MIXED AVIATION / COMMERCIAL / RESIDENTIAL
- MIXED AVIATION / COMMERCIAL
- MIXED INDUSTRIAL / COMMERCIAL



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ON AIRPORT
LAND USE

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ORDINANCES IN EFFECT

EXISTING ZONING

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.) 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 or greater in height than 200 feet above ground level.

NOTES

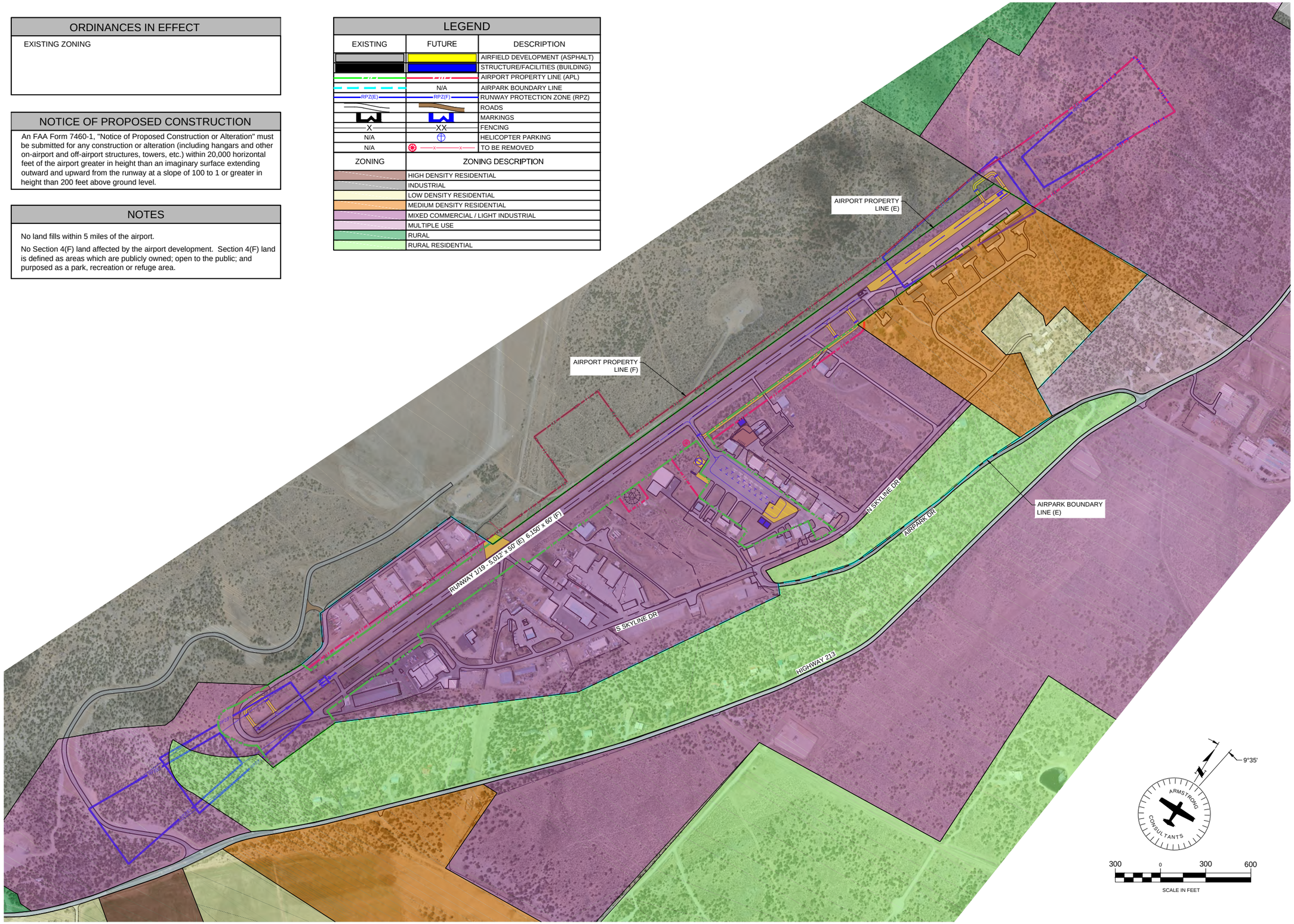
No land fills within 5 miles of the airport.

No Section 4(F) land affected by the airport development. Section 4(F) land is defined as areas which are publicly owned; open to the public; and purposed as a park, recreation or refuge area.

LEGEND

EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
	N/A	AIRPARK BOUNDARY LINE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
		ROADS
		MARKINGS
X	XX	FENCING
N/A		HELICOPTER PARKING
N/A		TO BE REMOVED

ZONING	ZONING DESCRIPTION
	HIGH DENSITY RESIDENTIAL
	INDUSTRIAL
	LOW DENSITY RESIDENTIAL
	MEDIUM DENSITY RESIDENTIAL
	MIXED COMMERCIAL / LIGHT INDUSTRIAL
	MULTIPLE USE
	RURAL
	RURAL RESIDENTIAL



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2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620507	LKB	JMR	JZP

OFF AIRPORT LAND USE

LEGEND					
EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		AIRFIELD DEVELOPMENT (ASPHALT)		000 000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)	N/A		PAPI
		AIRPORT PROPERTY LINE (APL)	N/A		AIRPORT BEACON
	N/A	AIRPARK BOUNDARY LINE		N/A	WIND CONE & SEGMENTED CIRCLE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			LIGHTED WINDCONE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)		N/A	SECTION CORNER
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4125	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROADS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
		AIRPORT REFERENCE POINT (ARP)			FENCING
	N/A	PACS/SACS MONUMENT	N/A		HELICOPTER PARKING
			N/A		TO BE REMOVED

EXISTING AIRPORT PROPERTY						
PARCEL	CURRENT OWNER	INTEREST	BOOK/PAGE	DATE	ACREAGE	FEDERAL PARTICIPATION
1	DURANGO-ANIMAS AIRPORT PROPERTY	FEE SIMPLE			±43	N/A
2	DURANGO-ANIMAS AIRPARK	N/A			±129	N/A

PROPERTY TO BE ACQUIRED			
PARCEL	INTEREST	ACREAGE	PURPOSE
3	FEE SIMPLE	±11	AERONAUTICAL
4	FEE SIMPLE	±11	AERONAUTICAL

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DURANGO-ANIMAS AIRPARK
DURANGO, COLORADO

C.D.O.T. No. 14-00C-01
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
5							
4							
3							
2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620508	LKB	JMR	JZP

EXHIBIT "A"
AIRPORT
PROPERTY
INVENTORY
MAP

Sheet: 13 of: 14

AERIAL PHOTOGRAPH BY: OLYMPUS
AERIAL SURVEYS TAKEN 04/2014

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5							
4							
3							
2							
1							
0	146205	09/2015	ORIGINAL ISSUE	620509	LKB	JMR	JZP

AERIAL PHOTOGRAPH

CHAPTER SIX

ENVIRONMENTAL OVERVIEW

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER SIX
ENVIRONMENTAL OVERVIEW

6.0 Introduction

This chapter examines the potential environmental impacts associated with the proposed airport improvements and provides an overview of those potential impacts. The following information is included for guidance purposes. As Durango-Animas Airpark does not receive Federal Aviation Administration grants, adherence to most environmental regulations are not mandatory. It is required to meet National Environmental Policy Act (NEPA) regulations whenever a proposed development:

- is proposed on federal lands;
- requires passage across federal lands;
- will be funded in part or in whole by federal money; or
- will affect the air or water quality that is regulated by federal law.

6.1 Air Quality

Air quality has become a major component of pollution control in the last 40 to 50 years. The passing of the Clean Air Act (CAA) in 1970 marked the beginning of government regulation to monitor and ensure pollution is controlled to the maximum extent possible.

The Clean Air Act of 1970 was enacted to reduce emissions of specific pollutants via uniform Federal standards. These standards include the National Ambient Air Quality Standards (NAAQS) which set maximum allowable ambient concentrations of ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead (Pb) and particulate matter 10 microns or smaller (PM_{10}). Section 176(c) of the Act, in part, states that no Federal agency shall engage in, support in any way or provide financial assistance for, license or permit or approve any activity that does not conform to the State Implementation Plan.

Air quality analysis for projects in areas not in compliance with the Environmental Protection Agency (EPA) approved State Implementation Plan (SIP) should be considered. Because the entire area is considered to be in attainment, no further air quality analysis is required.

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 should be obtained before construction begins.

The following Best Management Practices (BMP) are recommended to minimize construction emissions:

- 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.
- Construction Phase
- Cover trucks when transferring materials; and
- Minimize unnecessary vehicular and machinery activities.
- Completion Phase
- Revegetate any disturbed land not used; and
- Remove unused material and dirt piles;

Temporary air pollution may occur as a result of the proposed development. The design and construction of the proposed improvements should incorporate BMP to reduce air quality impacts, including minimizing land disturbance, wetting down, using water trucks, dust suppressant, covering trucks when hauling soil and the use of wind breaks. These practices would be selected based on the site's characteristics. No significant air quality impacts are anticipated as a result of the proposed development.

The Airport is located within an attainment area. An attainment area is a zone within which the level of pollutant is considered to meet NAAQS. Air pollutants are emitted by a variety of means and sources: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

No significant impacts to air quality are anticipated as a result of the recommended development projects.

6.2 Compatible Land Use

Land use compatibility considerations include safety, height hazards and noise exposure. 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 four zones surrounding the airport: the RPZ, the Approach Zone, Airport Influence Zone and the Traffic Pattern Zone. The RPZ is a trapezoidal area extending 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 Federal Aviation Regulation

(FAR) Part 77 Approach Surface area. Within the Approach Zone, public land uses, such as schools, libraries, hospitals and churches should be avoided. New residential developments within the Approach Zone should include avigation easements and disclosure agreements. The Traffic Pattern Zone is generally the area within one mile of the airport. Within the Traffic Pattern Zone, avigation easements should be considered for residential and public uses within this area and disclosure statements should be required. The Airport Influence Zone is the area where aircraft are transitioning between cruise altitude and the standard traffic pattern altitude of 800 to 1,000 feet above airport elevation.

The airport is owned and operated by the Animas Airpark Property Owners Association. The airport is located within La Plata County.

The land surrounding the airport is zoned as a Business/Industrial Overlay Zone. This permitted use allows industrial and commercial property to occur. The land use surrounding Durango-Animas Airpark is considered to be compatible with the proposed development, with the exception of the Runway 19 RPZ.

The Runway 19 approach/Runway 1 departure RPZ is penetrated by a series of hangars. The recommended development will remove the hangars from the RPZ.

The recommended development would not have a significant impact with respect to compatible land uses. The recommended development would actually improve the compatible land uses as it would remove the hangars from the RPZ. Therefore, no significant impacts to compatible land uses are anticipated as a result of the recommended development projects. Compatible Land Use and Height Restriction drawings are included as part of this Airport Layout Plan as a tool for the City of Durango and La Plata County to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.

6.3 Construction Impacts

Local, State and Federal ordinances and regulations address the impacts of construction activities, including dust and noise from heavy equipment traffic, disposal of construction debris and air and water pollution.

Construction operations for the proposed development would 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.

The contractor should obtain the required construction permits. The contractor should also prepare Storm Water Pollution Prevention and Fugitive Dust Control Plans for construction. These requirements would be specified in the contract documents for the construction of the proposed improvements.

No significant construction impacts are anticipated as a result of the recommended development.

6.4 Farmlands

The Farmland Protection Policy Act (FPPA) authorizes the U.S. Department of Agriculture (USDA) 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.

Figure 6-1 shows the USDA farmland classification ratings for the airport and adjacent development area. The entire area is classified as Not Prime Farmland (shaded in Red) or Prime if Irrigated (shaded in Yellow). None of this land is irrigated or utilized as farmland; therefore, no impacts to prime or unique farmlands are anticipated as a result of the recommended development.

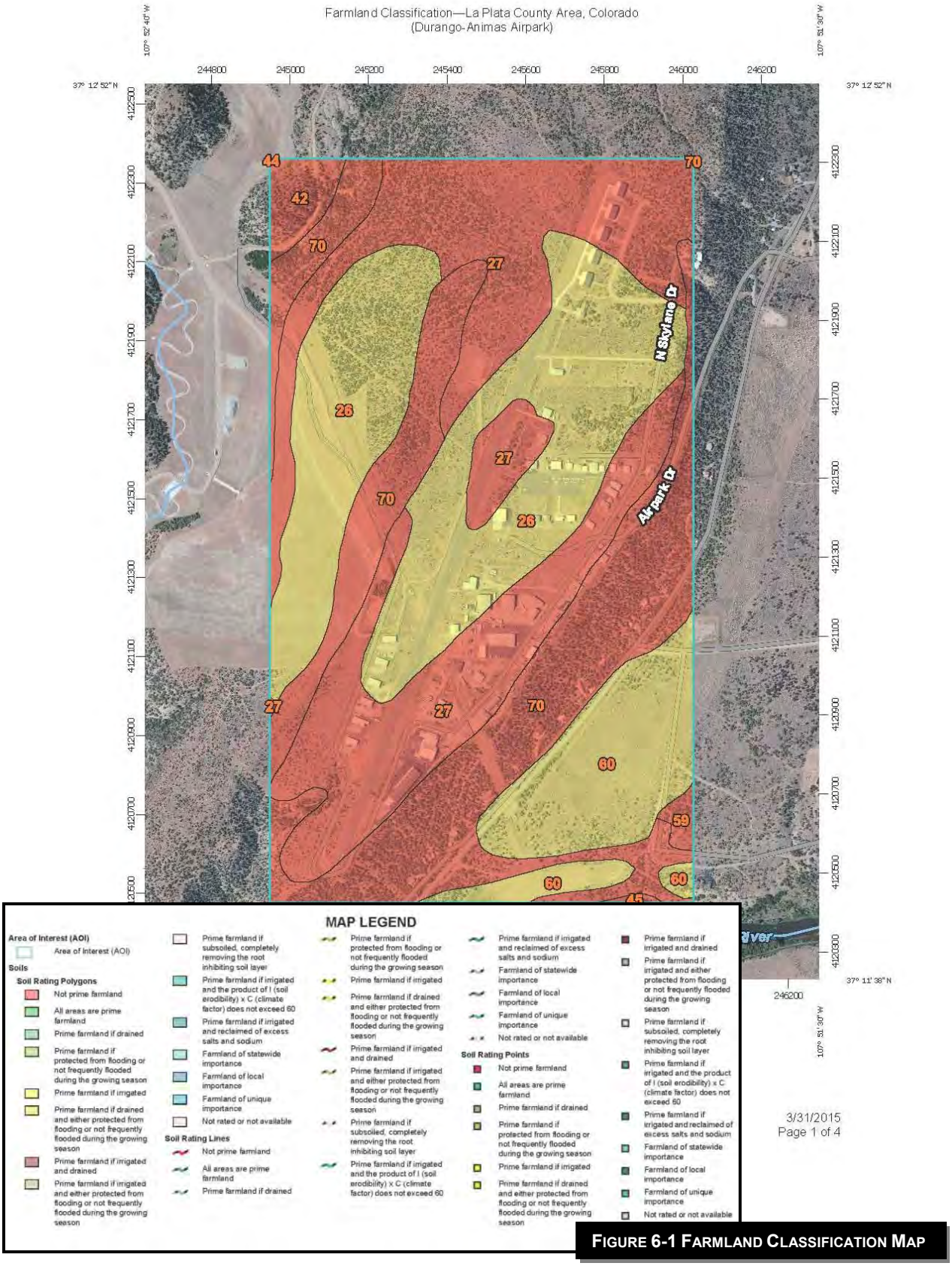

FIGURE 6-1 FARMLAND CLASSIFICATION MAP

6.5 Fish, Wildlife and Plants

This category concerns potential impacts to existing wildlife habitat and threatened and endangered species. Examining both the area of land to be developed 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 a significant impact. The surrounding area offers an abundance of similar habitat and the proposed improvements are not considered to be a significant habitat loss.

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.

According to the U.S. Fish and Wildlife Service, no critical habitats fall within the Airpark boundary or adjacent areas.

The following species were evaluated to determine if the boundary of the critical habitat was present either within or adjacent to the Airpark boundary.

<u>Endangered</u>

- Colorado pikeminnow, *Ptychocheilus lucius*
- Knowlton's cactus, *Pediocactus knowltonii*
- Razorback sucker, *Xyrauchen texanus*
- Southwestern Willow flycatcher, *Empidonax traillii extimus*

<u>Proposed Endangered</u>

- New Mexico meadow jumping mouse, *Zapus hudsonius luteus*

<u>Threatened</u>

- Mexican Spotted owl, *Strix occidentialis lucida*

<u>Proposed Threatened</u>

- Yellow-billed Cuckoo, *Coccyzus Americanus*

Based on a review of the habitat requirements of the listed species, no listed species or their associated habitat is known to be present within the recommended development area.

Therefore, no impacts to threatened or endangered species or their habitat is anticipated to occur as a result of the recommended development projects.

6.6 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 5050.4B, an airport development project would be a significant impact pursuant to NEPA if it results in notable adverse impacts on natural and beneficial floodplain values. Mitigation measures for base floodplain encroachments may include committing to special flood related design criteria, elevating facilities above base flood level, locating nonconforming structures and facilities out of the floodplain or minimizing fill placed in floodplains.

The development areas at Durango-Animas Airpark do not encroach upon a designated 100-year floodplain. Historical data shows there have been no flooding events at the airport. Based on the site evaluation, no floodplains are known to occur at the airport. **Figure 1-24** depicts the Federal Emergency Management Agency Flood Insurance Rate Map for Durango-Animas Airpark.

6.7 Hazardous Materials, Pollution Prevention and Solid Waste

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

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 improvements meet these criteria and would not significantly increase net waste output for the City of Durango or La Plata County.

Any existing or future 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 turbine aircraft, is considered by the FAA to be an incompatible land use because of the potential for conflicts between birds and low-flying aircraft. This determination is found in FAA AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. There are no existing 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. The nearest solid waste disposal facility is located near Bayfield, Colorado approximately 14 miles east of Durango-Animas Airpark.

6.8 Historical, Architectural, Archaeological and 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 mesa where Durango-Animas Airpark is located was formally known as Blue Mesa and was inhabited by Native Americans around 800 A.D. Blue Mesa was estimated to be home to approximately 600 inhabitants during this time period. There are reports of several prehistoric artifacts such as shards of pottery which have discovered on and adjacent to the Airpark's boundaries. The Native American Graves Protection and Repatriation Act does not apply to Durango-Animas Airpark as it is private land which does not receive federal funding. Future development should consider potential impacts to Historical, Architectural, Archaeological and Cultural Resources.

6.9 Light Emissions and Visual Impacts

Airfield lighting is the main source of light emissions emanating from an airport. The purpose of evaluating the change in light emissions is to determine the extent to which lighting improvements associated with proposed airport development would create an annoyance for inhabitants of properties in the immediate vicinity of the Airport. The determination of impact was based on the nature and intensity of lighting facilities at the Airport and its physical characteristics and anticipated uses of adjacent properties.

Light emissions from any of the development projects are expected to be localized and should not have any impacts beyond the areas of concern. Given the nature of the projects, lighting would be confined to illumination of runways, runway ends, parking areas, aircraft apron areas, and roadway lighting as required.

Significant light emission impacts are not expected as a result of the improvements. Landside improvements would remain consistent with existing light emissions and airside light emission would remain within the local airport operating environment.

6.10 Natural Resources, Energy Supply and Sustainable Design

All elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment and sensitivity to the concerns of the traveling public.

Energy requirements associated with airport improvements 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 which are in sufficient supply.

Energy requirements are not expected to significantly increase as a result of the proposed improvements. Demand for electricity and aircraft fuel is expected to increase with future development; however, the increase is not considered to be significant based on the forecasted activity levels documented in Chapter Two for the airport. Aircraft fuel should be stored in above ground tanks at the airport that conform to U.S. EPA regulations. Significant increases in ground vehicle fuel consumption are not anticipated.

The application of Leadership in Energy and Environmental Design (LEED) certification should be considered during the development of the multipurpose terminal building. LEED design utilizes strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Future development and improvement projects should take into account and apply sustainable design measures. Examples of sustainable design initiatives include, but are not limited to: adaptive shading, double skin walls, photovoltaic roof panels, induction lights on photocell, recycled flooring and carpets. Additional measures could also include reducing energy consumption through the installation of light-emitting diodes (LED) energy efficient airfield lighting.

6.11 Noise

Noise analysis considerations include 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 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 frequencies than they are 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.

The identification of airport generated noise impacts and implementation of noise abatement measures is a joint responsibility of airport operators and users. FAA Order 1050.1E states that "no noise analysis is needed for proposals involving Design Group I and II airplanes operating at airports whose forecast operations in the period covered do not exceed 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations…"

6.12 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. Gregg Flying Service maintains an SWPPP for Durango-Animas Airpark.

In July of 2002, the EPA amended the Oil Pollution Prevention Regulation at 40 CFR Part 112. Subparts A through C of this regulation is often referred to as the "SPCC rule" because they describe requirements for certain facilities (including airports) to prepare and implement Spill Prevention, Control and Countermeasure (SPCC) Plans. Gregg Flying Service maintains an SPCC plan for Durango-Animas Airpark. The SPCC plan would need to be updated whenever fuel improvements are made.

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 would be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent, prior to the initiation of construction activities.

Recommendations established in FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control,

would be incorporated into the project design and specifications. The design and construction of the proposed improvements should incorporate BMP to reduce erosion, minimize sedimentation, control non-storm water discharges and to protect the quality of surface water features potentially affected. These practices would 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.

Future fuel storage and dispensing facilities should 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 would be managed and disposed of in accordance with applicable Federal, State and Local regulations.

No significant impacts to water quality are anticipated as a result of the recommended projects.

6.17 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.

According to the U.S. Fish and Wildlife Service's National Wetlands Inventory, there are wetlands located within the southwest boundary of Durango-Animas Airpark. However, the area depicted as Freshwater Emergent has been developed into a commercial building/parking lot. There are no other known wetlands located within the Airpark boundary. The recommended development would avoid the potential wetland area and therefore no significant impacts to wetlands are anticipated. It is also recommended to verify, delineate or map the actual wetlands before developing in this area. The wetlands map for Durango-Animas Airpark is depicted in **Figure 4-2**.

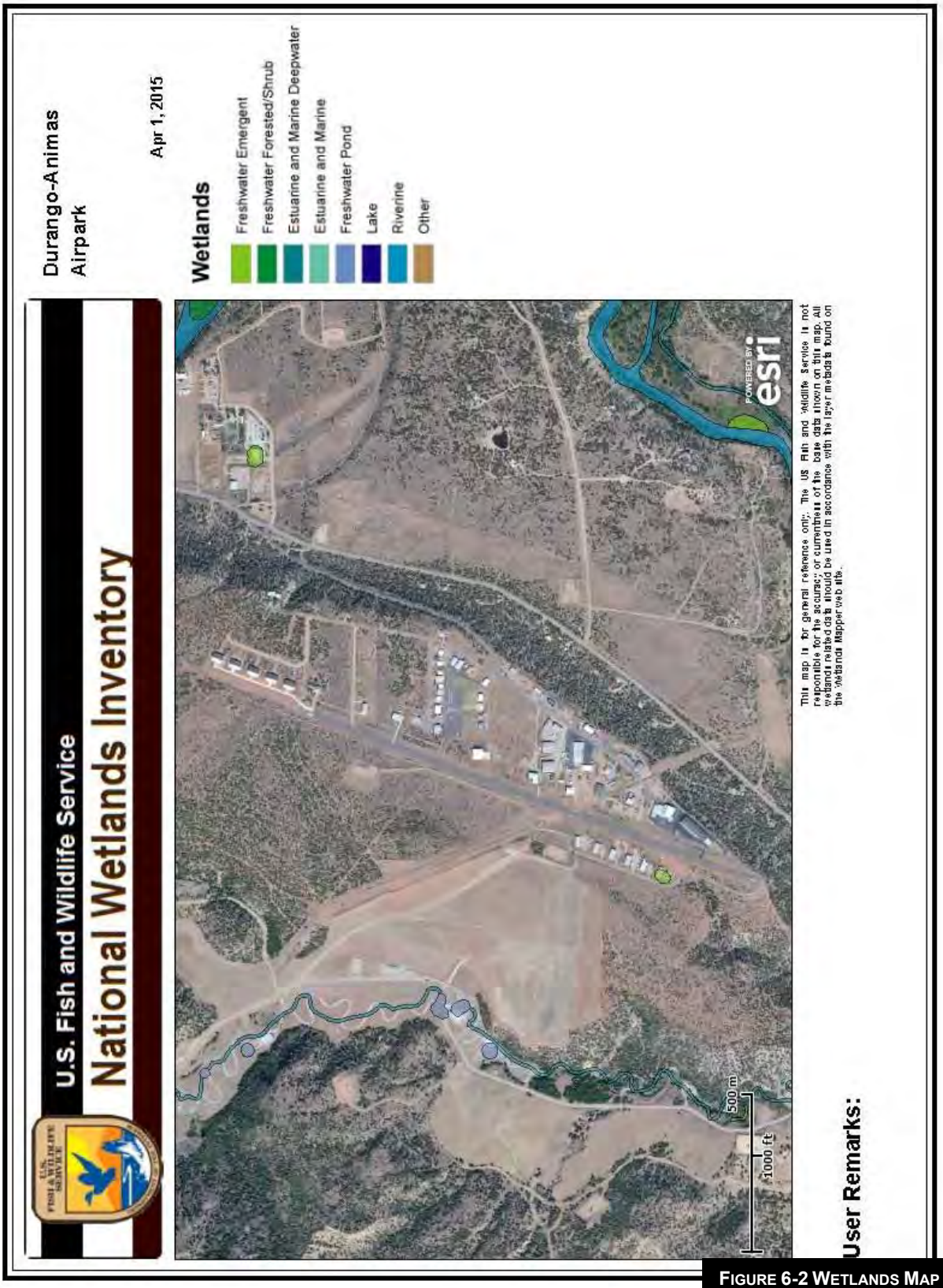

FIGURE 6-2 WETLANDS MAP

6.18 Wild and 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.

There are no Wild and Scenic Rivers located within a 50-mile radius of Durango-Animas Airpark. Therefore, no Wild and Scenic Rivers would be affected by the proposed improvements.

6.19 Summary of Potential Environmental Impacts

Table 6-1 provides a summary of the analysis ratings for each of the environmental impact categories with regard to the recommended development.

Table 6-1 Summary of Potential Environmental Impacts

Environmental Category	Recommended Development	Description
Air Quality	⦿	Short-term dust and exhaust during construction
Compatible Land Use	○	
Construction Impacts	⦿	Short-term dust, exhaust, erosion
Farmlands	○	
Fish, Wildlife and Plants	○	
Floodplains	○	
Hazardous Materials Pollution Prevention and Solid Waste	○	Short-term solid waste during construction
Historical, Architectural, Archaeological and Cultural Resources	⦿	Potential for archeological sites
Light Emissions and Visual Impacts	○	
Natural Resources and Energy Supply	○	
Noise	⦿	Increased aircraft operations
Water Quality	○	
Wetlands	○	Avoid existing wetlands
Wild and Scenic Rivers	○	

Legend:
○ No Impact
⦿ Minor Impact
● Significant Impact

CHAPTER SEVEN

FINANCIAL DEVELOPMENT PLAN

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

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CHAPTER SEVEN
FINANCIAL PLAN

7.0 Introduction

A program of recommended airport development has been formulated to guide the Animas Airpark Property Owners Association in the systematic development of Durango-Animas Airpark and to aid the Colorado Department of Transportation (CDOT) Aeronautics Division in allocating funding over the planning period. The recommended airport development plan is based on the facility requirements and development alternatives identified earlier in this report. Not all development shown may be eligible or available for CDOT grant funding.

7.1 Airport Development Plan

Future airport development at Durango-Animas Airpark, as included in this study, covers a 20-year planning period. Development items are grouped into three phases:

- Phase I is short-term (1-5 years)
- Phase II is medium-term (6-10 years)
- Phase III is long-term (11-20 years)

The phasing of projects (shown on the airport layout plan) assists the airport sponsor in budgetary planning for construction projects. A drawing showing the phasing of each project is included at the end of this Chapter. The sequence in which the projects are completed is important as the ultimate configuration of the airport will require numerous projects. Estimated development costs are included in **Table 7-1** for each of the recommended improvements.

Phase I (1-5 Years) Short-Term Development Items

- A1: Secondary Access Road Purchase
- A2: Pavement Maintenance and Add Displaced Threshold
- A3: Runway Safety Area Grading and Replace Runway Edge Lights
- A4: Land Acquisition for Wildlife Fence/AWOS Protection
- A5: Install Terminal Area/Wildlife Fencing and Access Gates
- A6: Install Rotating Beacon
- A7: Widen Runway 1/19 to 60 feet
- A8: Install PAPIs

Phase II (6-10 Years) Medium-Term Development Items

- B1: Construct Partial Parallel Taxiway/Bypass Taxiway/Turnaround
- B2: Install Self-Serve Fuel and Construct Fueling Area Pavement
- B3: Relocate Wind Cone and Segmented Circle
- B4: Install AWOS-III
- B5: Pilot Lounge / SRE Building Construction
- B6: Construct Vehicle Parking Lot

- B7: Acquire Snow Removal Equipment
- B8: Pavement Maintenance
- B9: Construct Sanitary Sewer Line

Phase III (11-20 Years) Long-Term Development Items

- C1: Extend Runway 1/19
- C2: Construct Additional Connector Taxiway
- C3: Aircraft Parking Apron Expansion
- C4: Helicopter Parking Pad
- C5: Airport Layout Plan Update
- C6: Pavement Maintenance

Table 7-1 Recommended Development Costs

Development		Total
Phase I (1-5 Years)		
A1	Secondary Access Road Purchase (See Note)	$1,400,000
A2	Pavement Maintenance and Add Displaced Thresholds	$200,000
A3	Runway Safety Area Grading and Replace Runway Edge Lights	$550,000
A4	Land Acquisition for Wildlife Fence/AWOS Protection	$150,000
A5	Install Terminal Area/Wildlife Fencing and Access Gates	$300,000
A6	Install Rotating Beacon	$75,000
A7	Widen Runway 1/19 to 60 feet	$600,000
A8	Install PAPIs	$80,000
	Total	**$3,355,000**
Phase II (6-10 Years)		
B1	Construct Partial Parallel Taxiway/Bypass Taxiway/Turnaround	$750,000
B2	Install Self-Serve Fuel and Construct Fueling Area Pavement	$550,000
B3	Relocate Wind Cone and Segmented Circle	$40,000
B4	Install AWOS-III	$325,000
B5	Pilot Lounge / SRE Building Construction	$500,000
B6	Construct Vehicle Parking Lot	$100,000
B7	Acquire Snow Removal Equipment	$115,000
B8	Construct Sanitary Sewer Line	$725,000
B9	Pavement Maintenance	$150,000
	Total	**$3,255,000**
Phase III (11-20 Years)		
C1	Extend Runway 1/19	$1,050,000
C2	Construct Additional Connector Taxiway	$75,000
C3	Aircraft Parking Apron Expansion	$300,000
C4	Helicopter Parking Pad	$75,000
C5	Airport Layout Plan Update	$150,000
C6	Pavement Maintenance	$150,000
	Total	**$1,800,000**
	Total Project Development	**$8,410,000**

7.2 Capital Development

Primary funding sources come from the State of Colorado and Local contribution. This section will identify and quantify the expected sources of capital funds. As previously indicated, State funds represent the majority of expected capital; however, a number of sources are identified and described below.

7.2.1 State of Colorado

The Colorado Department of Transportation Aeronautics Division participates in funding airport capital improvement projects in the State of Colorado. CDOT historically has funded up to 90% of eligible costs on projects without Federal participation through the Colorado Discretionary Aviation Grant (CDAG) program.

CDOT obtains their funds through user generated methods such as aviation fuel sales taxes. General funds are not used to support Colorado airports. A tax on all aviation fuel sold in the State of Colorado is then placed into the Colorado Aviation Fund. The fund is used to support the States aviation system through fuel tax reimbursements to airports, the CDAG program and statewide aviation system projects and programs. CDOT disperses 65% of the sales tax revenue collected back to eligible airports at which the fuel was sold via fuel tax reimbursements. Up to 5% of the fuel sales tax collected is used to fund and administer the Aeronautics Division. The remaining 30% of sales tax revenue funding is used to assist eligible public-use airports through the CDAG program.

CDOT also offers airports low interest rate loans through the State Infrastructure Bank (SIB). These loans can be utilized for various airport improvement and land acquisition projects.

7.2.2 Animas Airpark Property Owners Association

The airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs which are typically 10 to 20 percent of the total project 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 which are applied to almost all bank loan transactions.

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 State 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 or 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 State 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.

The Airport currently funds some or all of the cost of capital projects by generating revenue from the Animas Airpark Property Owners Association and other sources. These airport funds can come from annual surplus, reserves, or borrowing. While capital projects are usually funded from a variety of sources, in the end, Airport contributed funds have a role in almost all projects, particularly as seed money to initiate projects and to provide the match of State funds.
Other methods outside the traditional methods mentioned in the above paragraph are potential suppliers of money to construct capital improvements. These include users, tenants, investors, and other sources.

APPENDIX A

PUBLIC INVOLVEMENT

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

ARMSTRONG

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

TECHNICAL ADVISORY COMMITTEE KICK-OFF MEETING

May 16, 2014
3:00 P.M. – 4:30 P.M.
StoneAge Incorporated Conference Room

MEETING MINUTES

Purpose: Present the Airport Master Planning process to the Durango-Animas Airpark Technical Advisory Committee and garner feedback pertaining to the schedule, process, public involvement and expected deliverables.

Attendees:
Justin Pietz, Armstrong Consultants
Bob Wolff, Animas Airpark Property Owners Assoc.
Greg Hoch, City of Durango
Damien Peduto, La Plata County
Chuck Lawler, Private Citizen
Dave Dillon, Dillon Ranches
John Rostas, Armstrong Consultants
Gregg Boysen, City of Durango
Jim David, La Plata County
Jerry Zink, StoneAge, Inc.
JD Feuquay, Private Citizen

A Technical Advisory Committee (TAC) kickoff meeting was held on May 16, 2014 to present the Airport Master Planning (AMP) process to the TAC. Attendance at the meeting comprised of eleven individuals, including representatives from Animas Airpark Property Owners Association, City of Durango, La Plata County, nearby property owners, private citizens and Armstrong Consultants, Inc (ACI).

ACI began the presentation with an overview of the meeting agenda including topics to be discussed. Following the meeting agenda, ACI discussed the role of an AMP and the purpose the document serves for the airport's future development. The AMP was shown to be a document which provides a twenty year plan of development and Airport Layout Plan (ALP) drawings which would serve as a graphical depiction of the recommended present and future layout of the airport. The Animas Airpark Property Owners Association stated their reason for the selection of ACI for the AMP project and also asked how the public involvement process would be undertaken. ACI responded that the public involvement would be discussed in greater detail later on in the presentation.

The objectives of the AMP were also discussed in detail to highlight the overall goals the document would provide Durango-Animas Airpark and the overall community. Among these objectives are: determination of future aviation demand, evaluation of complying with Federal Aviation Administration (FAA) design standards, evaluation of a secondary access road, prioritizing future airside and landside development and ensuring the airport complements local/regional development.

The role of the TAC was presented to establish the level of involvement required to ensure the AMP meets the expectations of the airport's stakeholders and achieves the aforementioned objectives. The scope of involvement for the TAC was described as: assisting the consultant team with plan development, communicating TAC issues or concerns, acting as a liaison to the local community and providing feedback on the report and overall planning process.

ACI then presented the AMP process including the components of the document and the purpose of each chapter of the report. Additional detail regarding Working Papers was given to the TAC. The Working Papers will serve as a hard copy deliverable for the TAC to review the document in increments and provide feedback. Working Paper #1 will contain the Inventory and Forecast Chapters. The feedback would then be incorporated into a Draft Report which would serve as a cumulative document for review

prior to the finalization of the AMP. ACI also stated that Working Paper #1 was about two-thirds complete and would be sent to the TAC for review. Additionally, Olympus Aerial Survey has collected photogrammetry of the airport. The use of these detailed aerial images would be used to confirm any non-standard conditions at the airport and potential 14 CFR Part 77 airspace penetrations.

The technical aspects of the AMP were discussed by ACI. Design standards, types of aircraft, approach categories and design dimensions were explained. FAA guidance generally requires 250 takeoffs and 250 landings per year of the aircraft within a particular aircraft group in order to assign the Runway Design Code (RDC). The current RDC for Runway 1/19 is B-I (Small)-VIS and the types of aircraft that includes were discussed, which include single-engine piston, multi-engine piston and turbo-prop aircraft. The three components of RDC B-I (Small)-VIS were explained as: (1) Aircraft Approach Category (AAC), (2) Aircraft Design Group (ADG) and (3) visibility minimums. The AAC is denoted as a letter and describes aircraft approach speed. AAC B indicates an aircraft with approach speeds greater than 91 knots but less than 121 knots. The ADG is expressed in a numerical value and describes the aircraft wingspan and tail height in feet. Group I indicates aircraft with a wingspan less than 49 feet and a tail height less than 20 feet. The addition of "Small" to the ADG indicates the runway's pavement strength accommodates aircraft with a Maximum Gross Takeoff Weight less than 12,500 pounds. Visibility minimums indicate the lowest visibility requirements in feet for runways with an Instrument Approach Procedure (IAP). There are no IAPs at Durango-Animas Airpark and the visual approaches are expressed in the RDC as "VIS". The Airport Reference Code (ARC) is the highest RDC available, which is B-I (Small)-VIS. The airport configuration, existing facilities and instrument approach minimums were also discussed.

Additional focus on Durango-Animas Airpark not meeting FAA design standards was discussed. The airport currently does not meet FAA design standards for runway width, Runway Safety Areas, Object Free Areas, Object Free Zones and Protection Zones as well as potential 14 CFR Part 77 airspace penetrations. ACI stated that due to the airport's private ownership status and as a non-recipient of FAA funds, compliance with design standards is not required but recommended for safety considerations. ACI also stated that the AMP will place an emphasis on finding practical and feasible solutions to address existing non-standard conditions and all future development would incorporate FAA design standards. A question was asked if the location of a building within the Runway Protection Zone (RPZ) would have an impact on insurance rates. ACI stated that during the AMP recommendations for the RPZs would be provided.

ACI presented to the TAC the published based aircraft and total annual operations levels. The FAA Form 5010-1, *Airport Master Record*, indicates 45 based aircraft and 10,950 total annual operations. FAA Form 5010-1 data would be used as the base year figures for the Forecast of Aviation Demand. The TAC confirmed the published figures are correct.

Factors to be taken into consideration for the AMP were also discussed. ACI stated that focus would be given to: (1) local, regional and national trends affecting aviation demand and the impact on Durango-Animas Airpark, (2) the ability of the existing aircraft parking apron's ability to accommodate current and forecasted demand, (3) future locations and sizes of hangars, (4) airside and landside necessities such as weather observation systems, (5) compatibility of land use surrounding the airport, (6) impacts on flight training, (7) accommodation of helicopter traffic and (8) development of aeronautical and non-aeronautical revenue generation sources. A question was asked if the AMP would focus specifically on airside facilities or all facilities surrounding the airport. ACI stated the AMP would evaluate the requirements both on and surrounding the airport to ensure adequate measures to sustain future development.

The importance of public involvement with the AMP was discussed. The TAC is an important way to incorporate public involvement. ACI discussed the administration of user surveys and tenant discussions to aid in obtaining public input. Potential venues for public involvement were discussed as well as appropriate public notice methods including local paper and local internet webpages.

ACI then discussed the next steps which will be executed for the AMP process. ACI stated that Working Paper #1 will be sent out for TAC and State review. Working Paper #2 will begin thereafter and ACI will collect TAC and State comment to implement into the Draft Report. The presentation was concluded and opened up for question and comment.

A question was asked what percentage of aviation traffic at Durango-Animas Airpark is recreational versus business and commercial. ACI stated that there is no conclusive data to provide an exact figure but there are devices such as motion-sensor photographic monitoring systems which can document aircraft registration numbers to assist in determining traffic purpose and airport operations.

An additional question was asked regarding the schedule of the AMP and meetings, specifically, if a public involvement meeting would be conducted in October. ACI stated it is likely the public involvement meeting would be held in October but is subject to change depending on the pace of comments received and schedule availability.

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

DEVELOPMENT ALTERNATIVES TECHNICAL ADVISORY COMMITTEE MEETING

March 19, 2015
10:00 A.M. – 11:30 A.M.
StoneAge Incorporated Conference Room

MEETING SUMMARY

Purpose:

Present and discuss the Development Alternatives proposed as a part of the ongoing Airport Master Plan.

Attendees:

Bob Wolff, Animas Airpark Property Owners Assoc.
Greg Hoch, City of Durango
Jerry Zink, StoneAge, Inc.
Scott Storie, Colorado Dept. of Transportation*
John Rostas, Armstrong Consultants, Inc.
Del Gregg, Gregg Flying Service
Damien Peduto, La Plata County
JD Feuquay, Private Citizen
Justin Pietz, Armstrong Consultants, Inc.

**Attended via Phone*

Summary:

An Airport Master Plan presentation for Durango-Animas Airpark regarding the Development Alternatives was made in the conference room at StoneAge Incorporated. Attendance at the meeting consisted of the Technical Advisory Committee (TAC), Colorado Department of Transportation (CDOT) and Armstrong Consultants, Inc. (ACI).

ACI started the meeting by briefly describing the overall goal of the meeting, which was to determine the preferences for the alternatives presented in the Airport Master Plan. The current status of the Airport Master Plan project was also presented.

Prior to discussing the Development Alternatives, ACI described the existing Federal Aviation Administration design standards at Durango-Animas Airpark. These design standards are set forth to accommodate activity by the most demanding aircraft which uses the airport on a regular basis. In several areas, the airport does not meet the design standards. However, CDOT does not require design standards to be met. ACI recommended that wherever feasible FAA design standards should be met in order to enhance the airport safety.

ACI evaluated the following items to improve the airport:

- <u>Runway 1-19 Length</u>
  The existing runway length was determined to be adequate for the existing and forecasted fleet mix. Therefore, this item was not further evaluated.
- <u>Runway 1-19 Width</u>
  The existing 50 foot runway width was determined to be inadequate as it is deficient of the FAA design standard by 10 feet. It was recommended to widen Runway 1-19 to a 60 foot width. No alternatives were developed for this recommendation.
- <u>Taxiway System</u>
  It was determined the use of taxiways would enhance circulation and increase safety at the airport. Alternatives were developed to accommodate a full-length parallel, partial parallel and bypass taxiways at Durango-Animas Airpark.

- Non-Standard Conditions
  It was determined implementing corrective measures would increase the overall safety of the airport. Alternatives were developed to correct non-standard conditions at Durango-Animas Airpark.
- Instrument Approach Procedures
  Due to significant physical constraints impacting imaginary surfaces surrounding the airport and availability of instrument approach procedures at nearby Durango-La Plata County Airport, the existing visual approach was considered to be adequate. Therefore, this item was not further evaluated. The TAC agreed with this assessment.
- Aircraft Parking Apron and Landside Development
  Several apron and landside development items such as tiedown alignment, helicopter parking, self-serve fuel, snow removal equipment storage and a pilot lounge were recommended. A reconfiguration coupled with minor expansion of the existing aircraft parking apron was recommended to accommodate recommended wingtip clearance. The TAC agreed upon the recommended layout of the future apron and landside development.
- Secondary Access Road
  To improve vehicle circulation and emergency access to the Airport, it was determined necessary to develop secondary access. Alternatives were developed to accommodate a secondary access road.
- Miscellaneous Facilities
  Other facilities which were recommended to improve the airport included the installation of an Automated Weather Observation Station, segmented circle, rotating beacon, wildlife fencing and a sanitary sewer line. A single drawing of the airport facility depicted the recommended location of these future miscellaneous facilities. The TAC agreed upon the recommended layout of the future facilities.

Certain recommended items had various alternatives to accommodate the development. Evaluation was undertaken to determine the configuration, estimated cost and the pros/cons of each alternative.

Taxiway System

- Alternative 1
  This alternative included the construction of a full-length parallel taxiway. It was estimated to cost approximately $7.5 million. ACI determined this alternative would not be feasible due to substantial financial requirements, impacts to adjacent structures and topographical constraints. Alternative 1 was eliminated from further consideration.
- Alternative 2
  This alternative included the construction of a partial parallel taxiway connecting the aircraft parking apron to the Runway 1 threshold. It was estimated to cost approximately $800,000. The major advantages to this alternative included increasing aircraft circulation and enhancing safety while minimizing impacts to adjacent structures. The major disadvantage to this alternative is the associated costs.
- Alternative 3
  This alternative included the construction of two bypass taxiways. The bypass taxiways would be located on each runway end. It was estimated to cost approximately $600,000. The major advantage to this alternative is the lower comparative cost. The major disadvantage to this alternative includes the lower circulation compared to a full-length parallel taxiway would provide.
- Preferred Alternative
  The TAC preferred to implement Alternative 2 with bypass taxiways constructed on both Runway ends. Additionally, a mid-field turnaround was also recommended to be shown on the Airport Layout Plan in order to accommodate landing traffic.

Non-Standard Conditions

- Alternative 1
  This alternative would utilize displaced thresholds on each runway end to provide adequate Runway Safety Area (RSA) and Object Free Areas (ROFA) both alongside and beyond the runway ends. The Runway 1 end would be displaced by 577 feet and the Runway 19 end would be displaced by 240 feet. It was estimated to cost approximately $210,000. The major

advantage to this alternative includes the low cost of implementation. The major disadvantages to this alternative is that it does not remove existing structures from the Runway Protection Zone (RPZ) and the reduction in usable runway length.

- Alternative 2
  This alternative would utilize a displaced threshold on the Runway 1 end by 577 feet and extend the Runway 19 by 1,138 feet. This would provide adequate RSA and ROFAs both alongside and beyond the runway ends. Additionally, this alternative would remove the structures located in the existing Runway 19 approach RPZ. It was estimated to cost approximately $925,000. The major advantages to this alternative include the greater comparative correction of non-standard conditions and additional runway length. The major disadvantages to this alternative include the greater comparative cost and higher potential for environmental impacts.
- Preferred Alternative
  The TAC preferred to implement Alternative 2 on the Airport Layout Plan. CDOT further stated that as they are not a regulatory agency and Durango-Animas Airpark is not bound to FAA design standards. However, CDOT emphasized putting a strong effort into achieving FAA design standards to the greatest extent practicable. Until such a time that Runway 19 is extended to the north, the runway ends should be graded to meet standards.

Secondary Access Road

- Alternative 1
  This alternative would utilize an existing gravel pit access road adjacent to Durango-Animas Airpark. The easement is estimated to cost approximately $1.4 million. The major advantage to this alternative includes lower environmental impacts and lower comparative costs. There were no major disadvantages to this alternative.
- Alternative 2
  This alternative would construct a new secondary access road north of Airpark Drive. It is estimated to cost approximately $4.5 million. The major advantage to this alternative is it would provide a new road to the Airport. The major disadvantages to this alternative include the higher comparative cost and higher potential for environmental impacts.
- Preferred Alternative
  The TAC preferred to implement Alternative 1 on the Airport Layout Plan. Additionally, CDOT stated they would not support the funding of this project. Therefore, the project would have to be completed with Animas Airpark or local funds only.

Questions were asked regarding the status of CDOT funding levels. CDOT responded they anticipate their funding levels normalizing in Fiscal Year 2018. CDOT additionally stated that Durango-Animas Airpark would likely be low for funding prioritization until this time. However, CDOT did indicate that sealing the existing airfield pavements would be a priority.

The next step for the Airport Master Plan will be to release Working Paper #4. The document will include the Environmental Overview Chapter and Financial Development Plan Chapter. The Draft Airport Layout Plan and Draft Airport Master Plan will also be disturbed to the TAC and CDOT for review and comment soon. Once all comments have been addressed, the Airport Master Plan will be completed in the Final Report.

APPENDIX B

ACRONYMS

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

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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
RDC	Runway Design Code
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
TDG	Taxiway Design Group
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 Omni range on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omni range

APPENDIX C

GLOSSARY OF TERMS

DURANGO-ANIMAS AIRPARK
AIRPORT MASTER PLAN

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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 provides 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 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 (BRL)	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 othersurfaces.
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 involves 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 Design Code (RDC)	A code signifying the design standards to which the runway is to be built.
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.
Taxiway Design Group (TDG)	A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).
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 touchdown 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.