

CHAPTER 1 - INVENTORY OF EXISTING CONDITIONS

AIRPORT INVENTORY

This Inventory Chapter documents the 2018 conditions at Tucson Ryan Airfield (RYN or the Airport) and provides a foundation for the overall planning analysis in the subsequent chapters of the Ryan Airfield Master Plan Update. This chapter includes an overview of environmental conditions and land uses at and surrounding the Airport as a basis for evaluating planned improvements.

INTRODUCTION

This section summarizes the purpose and organization of this chapter and defines the key elements of the inventory.

CHAPTER PURPOSE AND ORGANIZATION

The Inventory Chapter looks at the physical layout of the Airport and documents 2018 conditions in terms of airfield design standards and aviation activity. The airport activity and design standards will be used in later plan chapters to address the need for improvements, to identify improvements that may be recommended, and as a basis for design alternatives. The Master Plan does not address management policies and procedures, staffing, or operational rules and regulations, because these topics are addressed in other airport documents.

This chapter begins with an overview of the Airport that covers location, history, role in the local community and aviation networks, and the components of airport operation. The Airport is a complex operation with three major facility areas: airside, landside, and the terminal area. This chapter documents the use, design, and condition of each of these three areas:

- ▶ Airside facilities are restricted from general public access – sometimes called “inside the fence.” This includes runways and taxiways, facilities for General Aviation (GA) parking and maintenance, support and other private business facilities with direct access to the runway, airport safety areas, and maintenance facilities.
- ▶ Landside facilities support airport activities without direct access to the airfield. They include internal roadways, parking areas, and non-aeronautical development areas.
- ▶ The terminal area provides a transition from the publicly accessible landside to the more restrictive user access to airside aircraft operations.

The chapter looks beyond the boundaries of the Airport to consider surrounding land uses that are subject to aircraft overflight and the catchment area from which the Airport draws its passengers and users. The Airport serves these businesses and the residents of these areas:

- ▶ City of Tucson
- ▶ Green Valley
- ▶ Town of Sahuarita
- ▶ Tohono O’odham Native American Reservation
- ▶ Pascua Yaqui Native American Reservation
- ▶ Pima County

The community around the Airport drives the demand for GA and other related services. Other airports serving the region are documented for their impacts to demand at the Airport.

The consultant team inventories environmental factors because they influence aircraft flight. Weather factors, such as temperature and wind direction, are significant to planning because they impact aircraft performance and drive facility design considerations. By documenting environmental conditions such as air quality and aircraft noise, the consultant team provides a basis for evaluating future development in terms of potential environmental impacts.

BACKGROUND

HISTORICAL OVERVIEW

RYN was initially developed for the Army Air Corps as a pilot training base during World War II in 1942. Two years after its development and at the end of the war in 1944, the pilot school was closed, and the Federal Government transferred ownership to the State of Arizona in 1948. In 1951, the State executed a lease agreement with the Tucson Airport Authority (TAA) to manage the airfield but retained ownership of the land. The State transferred both ownership of the land and the airfield lease with TAA to the City of Tucson in 1960.

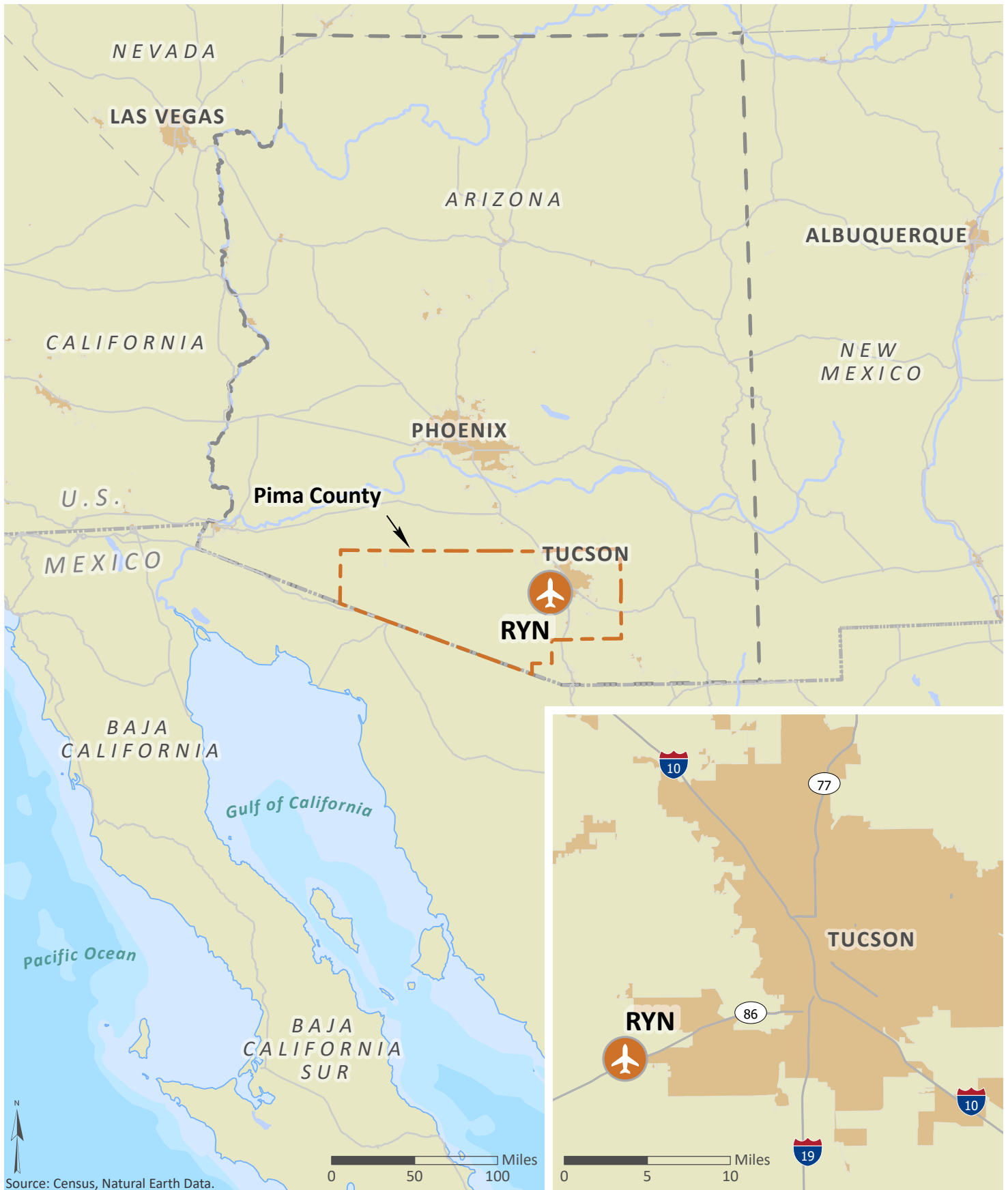
AIRPORT OWNERSHIP AND MANAGEMENT

RYN is owned by the Tucson Airport Authority (TAA). The TAA has a long-term lease with the City to operate and maintain both Tucson International Airport (TUS) and RYN. The TAA was created by state charter in 1948 to promote air transportation and commerce. The TAA does not receive any local tax dollars; instead, they rely on revenues to fund operations. Capital improvements are funded through state and federal grants.

AIRPORT LOCATION

RYN is located 14 miles southwest of Tucson at the intersection of State Route 86 and West Valencia Road. RYN comprises a total of 1,804 acres at 2,417 feet above mean sea level (MSL). RYN serves as a GA reliever to TUS and is one of five GA airports in Pima County.

Pima County occupies 9,189 square miles of south-central Arizona. Tucson, the second largest city in Arizona, is the county seat. Pima County is also the site of the Tohono O’odham Native American Reservation. **Figure 1-1** provides a location map within the State of Arizona and Pima County.



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AIRPORT ROLE

Ryan Airfield (RYN) is part of the Federal Aviation Administration's (FAA) *National Plan of Integrated Airport Systems (NPIAS)*. NPIAS is an active inventory of U.S. aviation infrastructure assets. It identifies airports that are significant to the national air transportation system. Airports identified as NPIAS qualified can receive federal funding assistance, typically under the FAA's Airport Improvement Program (AIP). The FAA uses the NPIAS to estimate the amount of AIP funding needed for infrastructure development projects. The FAA classifies RYN as a Regional Airport that connects to state and national economies and serves GA aircraft.

The Arizona State Airports System Plan classifies RYN as a reliever airport. RYN is intended to relieve general aviation traffic congestion at TUS. **Table 1-1** summarizes the Airport's current design standards and role in the State's aviation plan.

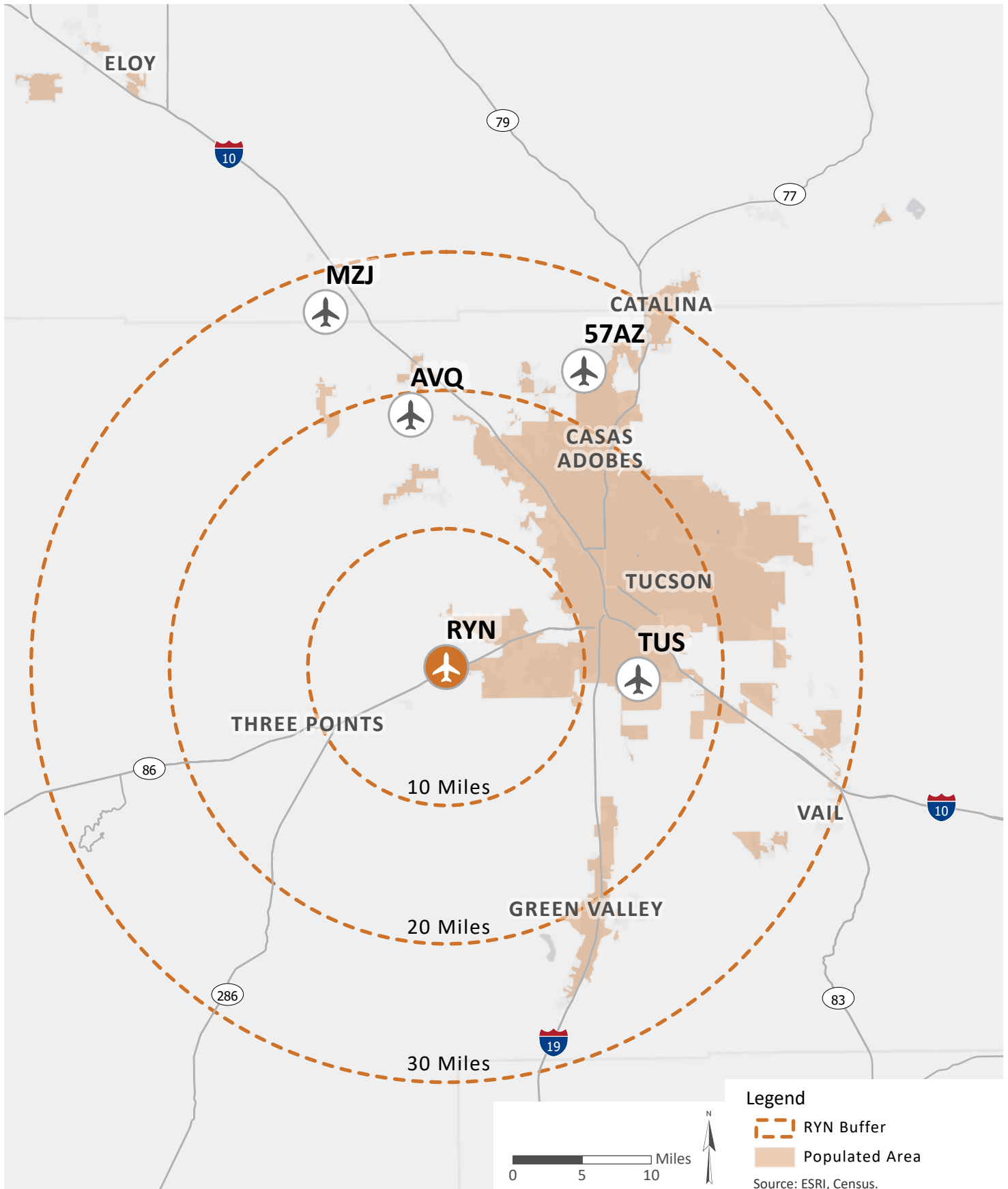
RYN is included in the Pima Association of Governments' 2045 Regional Mobility and Accessibility Plan (2045 RMAP). The 2045 RMAP was formally adopted by the Pima Association of Governments' Regional Council on May 26, 2016. The 2045 RMAP identifies projects, goals, and performance measures for the transportation system of the Tucson metropolitan area over the next 30 years and includes an overview of airport funding and expected growth.

Table 1-1: Airport Attributes

Airport Attributes	Description
Airport Owner	Tucson Airport Authority
FAA NPIAS Airport Classification	General Aviation
	Site Number: 00818. *A NPIAS # 04-0044
FAA Part 139 Certification	None
FAA Part 139 ARFF Index	Category A
FAA Airport Reference Code	B-II
Critical / Demanding Aircraft	Cessna Citation 560 Excel
State Airport Category	Reliever
Airport Traffic Control Tower	Contract Tower
Airport Property	1,804 Acres (Total Fee)
Navigational Aids	ILS, RNAV (GPS), VOR, NDB
Automated Weather Station	Automated Weather Observation Service
Communications	Air Traffic Control Tower Tucson Approach/Departure Control Albuquerque Air Route Traffic Control Center
Note: See Appendix for list of acronyms.	
Sources: FAA Publications and RYN Records obtained December 2018.	

AREA AIRPORTS

An airport's *catchment area* is the geographic boundary from which it draws its users, and airport activity is primarily influenced by the movement of people and products to and from the catchment area. Catchment areas are defined by the types of services offered at an airport, the proximity of competitor airports, and the tendency of the local population to use the airport. RYN's catchment area is based on the proximity of surrounding airports in Pima County and is shown in **Figure 1-2**. The influence nearby airports have on Ryan Airfield operations and service levels are discussed in **Chapter 2 – Aviation Activity Forecasts**.



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AIRPORT FACILITIES INVENTORY

AIRSIDE FACILITIES

Airside is a collective term for those areas of the Airport that are not accessible to the general public for security reasons. Airside areas are intended for use by aircraft operators and service providers and include runways, taxiways, aprons, and hangar areas. The Airport and the FAA continue to invest in RYN's facilities to maintain utility and function of the pavement surfaces and supporting infrastructure. **Table 1-2** summarizes the AIP grant funding, entitlement funding, or discretionary funding sources.

Table 1-2: Ryan Airfield FAA Airport Improvement Grants Since 2010

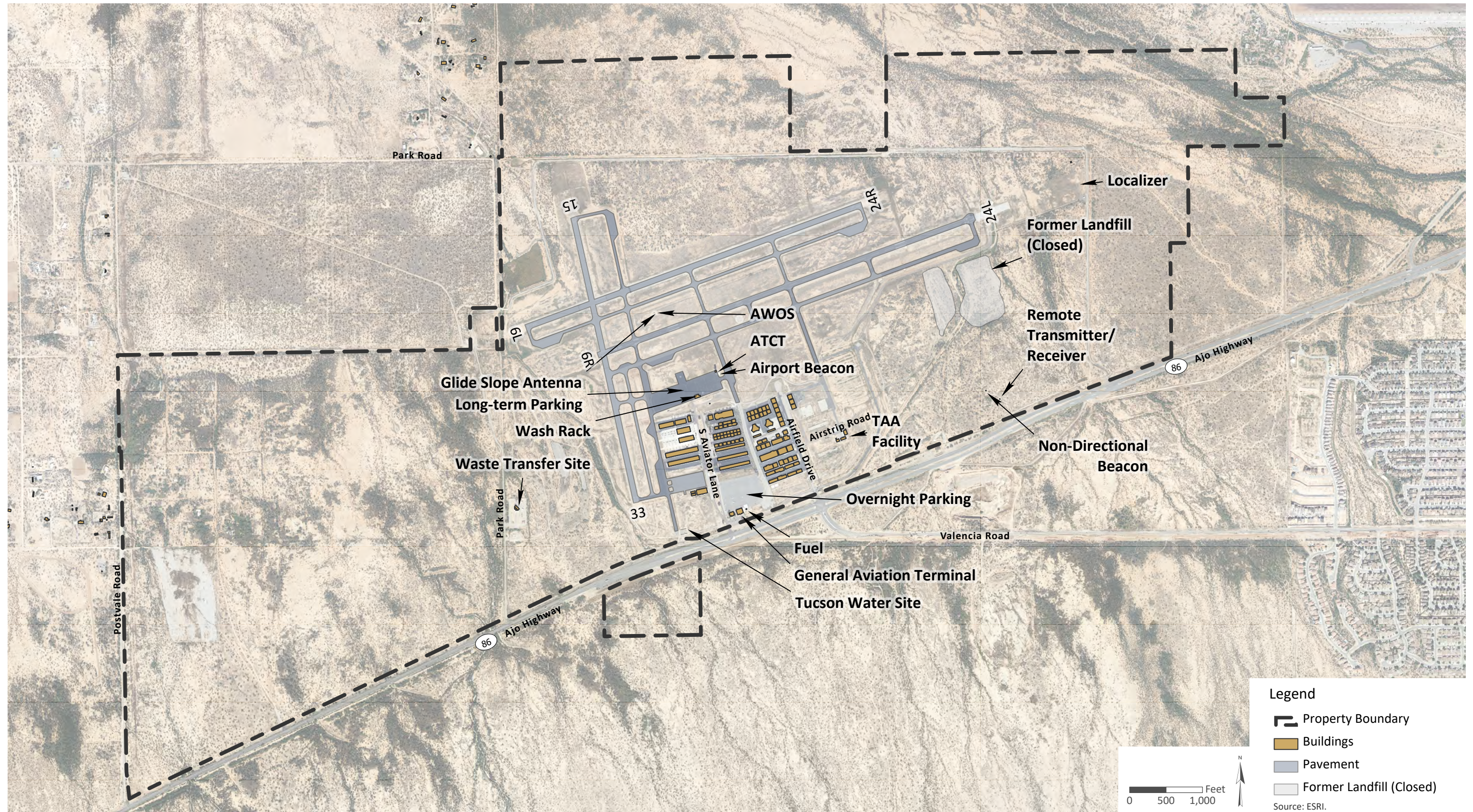
Year	Grant Number	AIP Federal Funds	Entitlement	Discretionary	Brief Description of Work
2010	21	\$2,535,572	\$970,343	\$1,565,229	Install Runway Lighting - 06L/24R Install Runway Vertical/Visual Guidance Install Taxiway Lighting Rehabilitate Runway 06L/24R and Taxiways
2010	22	\$75,000	\$75,000	\$0	Acquire Emergency Generator
2011	23	\$252,078	\$252,078	\$0	Install Emergency Generator
2012	24	\$2,436,731	\$184,590	\$2,252,141	Install Perimeter Fencing
2013	26	\$180,326	\$180,326	\$0	Construct Service Road, Perimeter Fencing
2013	25	\$179,388	\$179,388	\$0	Acquire Equipment
2014	27	\$1,571,691	\$1,571,691	\$0	Construct Service Road, Perimeter Fencing
2016	28	\$1,530,485	\$1,530,485	\$0	Rehabilitate Apron
Totals by type:		\$6,225,699	\$3,973,558	\$3,817,370	

Figure 1-3 shows the existing airport facilities. These facilities directly support aviation activity:

- ▶ Pavement: runways, taxiways, and aprons
- ▶ Structures: aircraft storage and maintenance hangars, fixed-base operators (FBOs), fuel storage, and an emergency vehicle
- ▶ Navigational aids (NAVAIDs): airfield and approach lighting, weather monitoring systems, and radio beacons
- ▶ Airfield signage and markings: indicators for precision and non-precision instrument runways
- ▶ Terminal Building: pilot and passenger support and services and administrative areas
- ▶ Safety areas: property set aside to comply with FAA-mandated setbacks and clear zones

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RUNWAY SYSTEM

RYN has a three-runway system. Two are parallel runways (primary 6R/24L and secondary 6L/24R) and the third is a crosswind runway (15/33). Each of the runways is equipped with Medium Intensity Runway Lights (MIRLs) that can be activated from the Air Traffic Control Tower (ATCT) or by the pilots when the ATCT is closed. The parallel runways have a pavement load bearing strength of 12,500 pounds for single-wheel loading (S) and 30,000 pounds for dual-wheel loading (DWL).

Runway 6R/24L is 5,500 feet long by 75 feet wide. Runway 6R is marked for the precision approach associated with the Instrument Landing System (ILS). Runway 6R is equipped with Runway End Identifier Lights (REILs).

Runway 6L/24R is 4,900 feet long by 75 feet wide. The runway has basic markings for visual operations. Runway End 6L has REILs.

Runway 15/33 is 4,010 feet long by 75 feet wide and has basic markings for visual operations. The pavement has a load bearing strength of 12,500 pounds for single (S) wheel gear aircraft. The Runway End 6R threshold lies across Runway 15/33 and represents a concern for compliance with FAA design standards. To reach the threshold end of Runway 6R, aircraft must taxi onto Runway 15 and then turn onto Runway 6R. When the ATCT is not operating, there is the potential for aircraft to be operating from both runways simultaneously. Resolution for the Runway 6R threshold location on Runway 15/33 will be addressed in the facilities requirements and alternatives chapters of this Master Plan.

INSTRUMENT APPROACHES

Instrument Approach Procedures (IAPs) consist of a series of prescribed maneuvers and serve as a transition from the en route environment to initial approach to a landing or to a point from which the landing can be made visually. IAPs are classified as precision instrument (with both horizontal and vertical guidance), non-precision instrument (with only horizontal guidance), and visual (without positional guidance).

RYN has two IAPs to Runway End 6R. The Runway 6R ILS, which is a precision approach, also includes variations for a Localizer Antenna (LOC) only and circling to land. The LOC only approach does not provide vertical guidance and is a non-precision approach. Circling to land is conducted with visual reference to the airport and allows pilots to land on a runway other than the primary runway. The Runway 6R nondirectional beacon (NDB)/distance measuring equipment (DME) also has a Global Positioning System (GPS)-based alternative with the same approach profile and minimums. Approach minimums for visibility and ceiling height to conduct the approach vary depending upon the approach speed category of the aircraft using the approach procedure. Different visibility and cloud height minimums also apply for higher aircraft approach category (AAC) using the approach and to circle to land. AAC is based on approach speed and is the first letter in an aircraft's runway design code (RDC). The instrument approach type, AAC, and minimums are summarized in **Table 1-3**.

Table 1-3: Instrument Approach Summary

Runway End	Procedure	Procedure Type	Aircraft Categories	Minimum Descent Above Ground Level (AGL)	Visibility Minimums (Statute Mile)
6R	ILS 6R	Precision	A, B, C, D	300'	1
	LOC 6R	Non-Precision	A, B	500'	1
		Non-Precision	C	500'	1 1/4
		Non-Precision	D	500'	1 1/2
	CIRCLING	Non-Precision	A, B	500'	1
		Non-Precision	C	500'	1 1/2
		Non-Precision	D	600'	2
6R	NDB/DME & GPS	Non-Precision	A, B	900'	1 1/4
		Non-Precision	C	900'	2 3/4
		Non-Precision	D	900'	3
	CIRCLING	Non-Precision	A, B	900'	1 1/4
		Non-Precision	C	900'	2 3/4
		Non-Precision	D	900'	3

Source: Ryan Airfield Published Instrument Approach Procedures (Published March 2019)

TAXIWAY SYSTEM

The Airport has parallel taxiways for each of the three runways. Taxiway A parallels Runway 6L/24R, and Taxiway B parallels Runway 6R/24L. Taxiway D is the full-length parallel taxiway for Runway 15/33. Taxiway C is a partial-length parallel for Runway 15/33. Connector Taxiways B2 and B4 provide access to Runway 6R/24L from the hangar and apron areas. A network of taxilanes provides access between aprons, hangars, and tie-downs, and the taxiway and runway system.

PAVEMENT CONDITION

The FAA requires the airport sponsor receiving federal funds for pavement improvement projects to implement a pavement maintenance management program. To meet this requirement, a Pavement Condition Index (PCI) rating is used as part of the established pavement maintenance management program. The pavement condition rating is based on the guidelines contained in FAA Advisory Circular (AC) 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*.

The PCI survey captures data that provides engineers and managers with a numerical value indicating overall pavement conditions and reflecting both the structural integrity of the pavement and the future maintenance requirements for operations. A PCI survey is performed by measuring the amount and severity of certain distresses (defects) observed within a pavement sample unit.

Figure 1-4 illustrates the PCI for RYN's paved surfaces. Pavements below 70 usually require reconstruction rather than rehabilitation due to deteriorating subgrade and failure of surface grades. Runway 6L/24R has a PCI rating of 88, which is considered to be good. Runway 6R/24L is rated between 69 and 70 and is on the borderline of fair condition, which is expected to need pavement rejuvenation or maintenance to extend the runway pavement service life. Runway 15/33 is rated at 61 and is in poor condition, which means it needs resurfacing or reconstruction.

Figure 1-4 also shows the layout for the three-runway system, the layout for the taxiways that support operations, and the various hangar and apron areas at RYN.

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FEDERAL AVIATION ADMINISTRATION IDENTIFIED HOT SPOTS

A *hot spot* is a runway safety related problem area or intersection on an airport. Typically, it is a complex or confusing intersection of two taxiways or of a taxiway and a runway. A confusing condition may be compounded by a miscommunication between a controller and a pilot and may cause an aircraft-separation standard to be compromised. The area may have a history of surface incidents or the potential for surface incidents. This may be due to any mix of causes:

- ▶ Airport geometry
- ▶ Ground traffic flow
- ▶ Markings, signage, or lighting
- ▶ Human factors

RYN has one FAA-identified hot spot due to runway and taxiway geometry at the intersection of Taxiway B and Runway 15/33. For a pilot to access the Runway End 6R from Taxiway B, the pilot must first enter Runway 15/33 and use it as a taxiway to reach Runway 6R. The ATCT must clear a plane to enter Runway 15/33 and then clear them on to Runway 6R. The FAA AC 150/5300-13A Chapter 4, Section 5(f) states that airports should avoid “dual purpose” pavements. Runways used as taxiways and taxiways used as runways can lead to confusion. A runway should always be clearly identified as a runway and only a runway. Pilots may experience a loss of situational awareness or misunderstand clearances from the control tower and inadvertently enter Runway 6R or Runway 15/33 without clearance.

AC 150/5300-13A Section 5(g) directs airports to not design taxiways that lead directly from an apron to a runway without requiring a turn. Such configurations can lead to confusion in cases where a pilot expects to encounter a typical, parallel taxiway but instead accidentally enters a runway. Direct access from apron to runway occurs at these locations:

- ▶ Taxiway D1 entering Runway 33
- ▶ Taxiway D entering Runway 6R
- ▶ Taxiway B2 entering Runway 6R/24L
- ▶ Taxiway B4 entering Runway 6R/24L

APRONS

There are five aprons at RYN consisting of 70,499 square yards of pavement that provide tiedown spaces for 160 aircraft. Apron space and aircraft tie downs are summarized in **Table 1-4**.

Table 1-4: Apron System Summary

APRON SYSTEM				
Owner	Apron Area	Square Yards	Tie Down Spaces	Other Services
TAA	South Apron	24,000	50	Self-Serve Fuel
TAA	North Apron	28,900	51	Aircraft Wash Rack
TAA	Southwest Apron	10,500	20	NA
Flight School	Flight School	1,044	5	NA
Vista West	Vista West Apron	6,055	16	15 nose shades
Total		70,499	142	

Source: Ryan Airfield Staff (2019)

PAVEMENT MARKING, LIGHTING, AND SIGNAGE

Airfield Marking

Runway markings are white and indicate the IAP category for each runway threshold. Runway 6R has markings for a precision approach associated with the ILS. Runways 6L/24R, 24L, 15, and 33 are marked for visual approaches.

Airfield Lighting

Runway lighting systems enable aircraft to use the runways during periods of low visibility and assist in identifying the runway environment during instrument landings. Runway lights are white. All RYN Runways are equipped with MIRLS. The lights are controlled by the ATCT when the Tower is open. Airfield lighting is pilot controlled when the ATCT is closed.

Approach lighting systems allow the pilot to visually identify the runway environment and align the aircraft with the runway. Visual Glide Slope Indicators are ground-based visual aids that use lights to help pilots monitor their angle of descent during landing. Runway 24L is equipped with a 4-box Visual Approach Slope Indicator. Runways 6L and 6R are equipped with REILs.

Table 1-5 summarizes RYN runway and taxiway signage facilities supporting the existing airfield operations, supporting IAPs, and complying with the airfield signage plan.

Table 1-5: Markings, Lighting, and Signage

Markings, Lighting and Signage	Runway 6L/24R		Runway 6R/24L		Runway 15/33	
	6L	24R	6R	24L	15	33
Runway Markings	Visual	Visual	Precision	Visual	Visual	Visual
Aim Points	Yes	Yes	Yes	Yes	None	None
Centerline	Yes	Yes	Yes	Yes	Yes	Yes
Threshold Bars	None	None	Yes	None	None	None
Runway Number and Edge Lines	Yes	Yes	Yes	Yes	Yes	Yes
TDZE Distance Markers	None	None	Yes	None	None	None
Runway Lighting	MIRL	MIRL	MIRL	MIRL	MIRL	MIRL
MALSR	None	None	None	None	None	None
Visual Approach Path Guidance	None	None	None	VASI 4-L	None	None
REIL	Yes	None	Yes	None	None	None
Runway and Taxiway Signage	Yes	Yes	Yes	Yes	Yes	Yes
Distance Remaining Signs	None	None	None	None	None	None
Runway Entry Hold Signs	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Location Signs	Yes	Yes	Yes	Yes	Yes	Yes
Taxiway Directional Signs	Yes	Yes	Yes	Yes	Yes	Yes

Source: FAA Form 5010 Airport Master Record (2019)

NAVIGATIONAL AIDS (NAVAIDS)

Electronic NAVAIDS

NAVAIDs provide guidance and positional information to aircraft. NAVAIDs can be airborne or located on the ground, and they can be visual or electronic. NAVAIDs include lighting systems, radio beacons, signage, GPS satellites, and pavement markings. The types of electronic NAVAIDs available for aircraft flying to or from RYN include the Very-High-Frequency (VHF) Omni-directional Radio Range (VOR), the Non-directional Beacon (NDB), and Global Positioning System (GPS). NAVAIDs can transmit guidance and airport operational information to aircraft en route and allow pilots to operate in periods of reduced visibility.

The VOR provides guidance to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, DME is combined with a VOR facility to provide information on both distance and direction to the pilot. The Tucson VOR/DME, located at TUS, is 13.5 nautical miles east of Ryan Airfield.

The NDB transmits nondirectional radio signals; whereby, the pilot can determine the bearing to or from the NDB facility and then “home” or track to or from the station. RYN is equipped with NDB equipment on the airfield. The Robles NDB is located approximately 12 miles southwest of RYN and provides an initial approach fix to the airport.

The Instrument Landing System (ILS) has two components that work in tandem to provide precision instrument approach guidance to Runway End 6R. The Localizer (LOC) is installed beyond the end of Runway End 24L and provides final course guidance. The glideslope (GS) is installed to the left of Runway 6R, 970 feet from the threshold, and provides vertical guidance on the descent path.

RYN is equipped with an automated weather observation system (AWOS-3). Weather data is transmitted on VHF frequency 133.35 for use by pilots and controllers. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The AWOS reports cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), thunderstorm activity, and density altitude (airfield elevation corrected for temperature). The AWOS is located adjacent to the ILS glide slope antenna. Weather data is also sent to the National Oceanic and Atmospheric Administration for record keeping and analysis.

TERMINAL AREA

The terminal areas at RYN provide services and facilities for based tenants, transient and local aircraft, and aviation support facilities. This section describes the existing facilities for the Administrative building and Terminal facility, FBOs, aircraft storage and parking, and airfield maintenance.

Terminal Building

The terminal and administrative offices building is located on the southwest side of the airport, near the intersection of West Ajo Highway and West Valencia Road next to Richie's Café restaurant and the self-serve fuel facilities for aircraft. The terminal building is 2,500 square feet and has spaces designated for the administrative offices, a pilot lounge, a briefing room, a conference room, and restrooms.

GA Services

An FBO is a business that provides aircraft services, such as fuel sales, aircraft maintenance, flight training, and aircraft storage. RYN has several FBOs. Velocity Air, Inc. provides aviation fuel, aircraft parking, power cart service, and a passenger and pilot lounge. TAA also provides the primary terminal building facility adjacent to the self-serve fuel island. The TAA facilities are available for flight planning, pilot and passenger lounges, and short-term transient apron tie downs. Aircraft services are provided by B&M Aircraft, Sonoran Avionics, and Tyconin, Inc. Additional businesses located on the airport provide support services for tenants and airport users.

Aircraft Hangars

All hangars are located south of Runway 6R/24L and east of Runway 15/33. There are 251 individual aircraft storage units totaling 434,830 square feet. There are 30 multiple-unit T-hangar buildings and 157 separate conventional hangar units. There are also 64 spaces for aircraft under shade hangar facilities totaling 18,900 square feet of parking space. Demand for the hangars is high, so the TAA maintains a wait list because all hangars are currently occupied.

Taxiway and Taxilane

To reach the existing terminal facilities and self-service fuel station, pilots use Taxiway B2 and then continue south past hangars and tie down aprons to the southern end of the taxiway. Aircraft in hangars, located between Aviator Lane, and Taxiway D use Taxiway D to access the runway system. Aircraft in hangars between Aviator Lane and Taxiway B2, as well as those in hangars between Taxiway B2 and Airfield Drive, access the airfield via Taxiway B2. Hangars located to the east of Airfield Drive access the airfield via Taxiway B4.

Fuel

The TAA provides the primary aviation fuel storage facilities at RYN, which consists of two 12,000-gallon underground storage tanks purchased in 1989. The tanks are located next to the Airport Administrative offices. The underground tank system is regularly inspected for serviceability, leak detection, and monitoring of active measure corrosion controls. The storage tanks remain in good serviceable condition. The fuel in these tanks is dispensed at the self-service fuel island. Velocity Air, Inc. owns one 100 low-lead (LL) fuel truck with a 1,000-gallon capacity to deliver fuel. For fuel deliveries to turbine-powered aircraft, Velocity Air, Inc. owns two Jet A trucks with a total capacity of 5,500 gallons.

Joint Use Fire Facility

RYN is not an FAA commercially certificated airport and is not required to have ARFF equipment and personnel onsite. Still, the TAA does maintain an emergency vehicle at the airport that has the capability of applying aqueous foam and dry chemical flame retardants. The emergency equipment is stored in the maintenance facility. The TAA has a mutual aid agreement with the Drexel Heights Fire Department to respond to fires and emergencies on the Airport. The TAA provides materials and training to familiarize fire department staff with operations and on-site equipment at RYN.

Airport Maintenance and Storage Facilities

The TAA performs the airfield maintenance at RYN. The maintenance facilities are located on the east side and consist of a 2,400-square-foot maintenance shop, an 1,800-square-foot shade parking structure, a 1,200-square-foot storage room, a pesticide shed, a paved vehicle movement area, and fuel storage facilities. There are two 1,000-gallon tanks, one for unleaded auto gas and one for diesel fuel, for use by airport maintenance vehicles. The tanks are above-ground units near the maintenance facility. The maintenance area is accessible through a security gate entrance off Airfield Road and a service road from Taxiway B4.

ATCT

Three entities provide air traffic control within the vicinity of RYN: the ATCT, Tucson Approach and Departure Control, and Albuquerque Air Route Traffic Control Center (ARTCC). The RYN ATCT is the only tower in southern Arizona that is part of the FAA Contract Tower program and is operated by Serco Management Services. Serco is one of four private companies under contract with the FAA to provide tower service nation-wide at non-FAA towers. The ATCT is staffed from 6:00 a.m. to 8:00 p.m. each day; when open, the surrounding airspace is Class D. At all other times, the airspace is Class E. The Tower Local position controls the runways and surrounding Class D airspace. The

Ground control position directs aircraft movements on the ground to and from the runway environment. Flight data delivers flight plan clearances and updates the Automated Terminal Information System. During periods of low-traffic workloads, the tower positions may be combined and worked by a single controller.

The ATCT is located in the northeast corner of the north parking apron. The tower cab is 65 feet above ground level with the offices and break area below the main cab. RYN's rotating beacon is co-located on the top of the ATCT.

Figure 1-5 shows the terminal area at RYN, including the roadway access, taxilanes, T- hangars, conventional hangars, aprons, and maintenance and emergency facilities described above.



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AIRSPACE SURFACES

The FAA has jurisdiction authority over airspace and establishes the rules pilots must operate under within each airspace. When the Ryan Airfield ATCT is open, the surrounding airspace is Controlled Class D airspace. The Class D airspace extends approximately 4 nautical miles around the Airport from the surface to 4,199 feet MSL. The Class D airspace is only in effect when the ATCT is operational, from 6:00 a.m. to 8:00 p.m. daily. When the ATCT is closed the airspace reverts to Uncontrolled Class E airspace that reaches to the surface. The Class E airspace has extensions to the west and northwest to accommodate instrument approaches to Runway 6R. **Figure 1-6A** shows the visual flight rules (VFR) aeronautical chart for the surrounding FAA airspace structure, navigational routes, and public use airports.

To illustrate the structure and interaction of the different airspace classes **Figure 1-6B** shows the typical dimensions as well as the rules that pilots must follow in that airspace. The airspace for TUS and Davis Monthan Air Force Base is Class C. The Class C airspace is controlled airspace from the surface to 6,600 feet above ground level (AGL). The Class C airspace for the two airports meets to form an oval but retains separation as two different ATCT airspace jurisdictions. Class C airspace is made up of two cylinders, an inner and an outer, centered on the Airport. The inner cylinder extends from the surface of the airport up to 6,000 feet AGL. The outer cylinder airspace has a radius of 10 nautical miles, a base of 4,200 feet AGL, and a ceiling up to 6,600 feet AGL. A portion of the TUS outer cylinder of Class C airspace lies immediately on top of the RYN Class C airspace to the east of the Airport beginning at 4,400 feet MSL.

Special Use Airspace – Military Operations Areas (MOA)

The MOAs in the vicinity of RYN are all controlled by the ARTCC and include the Ruby 1 MOA, Fuzzy MOA, Sells 1 MOA, and the Sells Low MOA, all of which are located southwest of the airfield. Pilots are expected to check on the operational status of the airspace and have contact with air traffic control prior to entering. The operational times and restrictions are published.

Wilderness Areas

Several wilderness areas are in proximity to the Tucson area. Saguaro National Park (5 nautical miles [nm] north), Coyote Mountains Wilderness Area (16 nm southwest), Pusch Ridge Wilderness Area (16 nm northeast), and the Mt. Wrightson Wilderness Area (27 nm southeast) provide wildlife habitat that could impact safe operations and that could experience environmental impacts as a result of aircraft operations. Aircraft are requested to maintain a minimum altitude of 2,000 feet above the surface of designated National Park areas, which includes wilderness areas and designated breeding grounds.

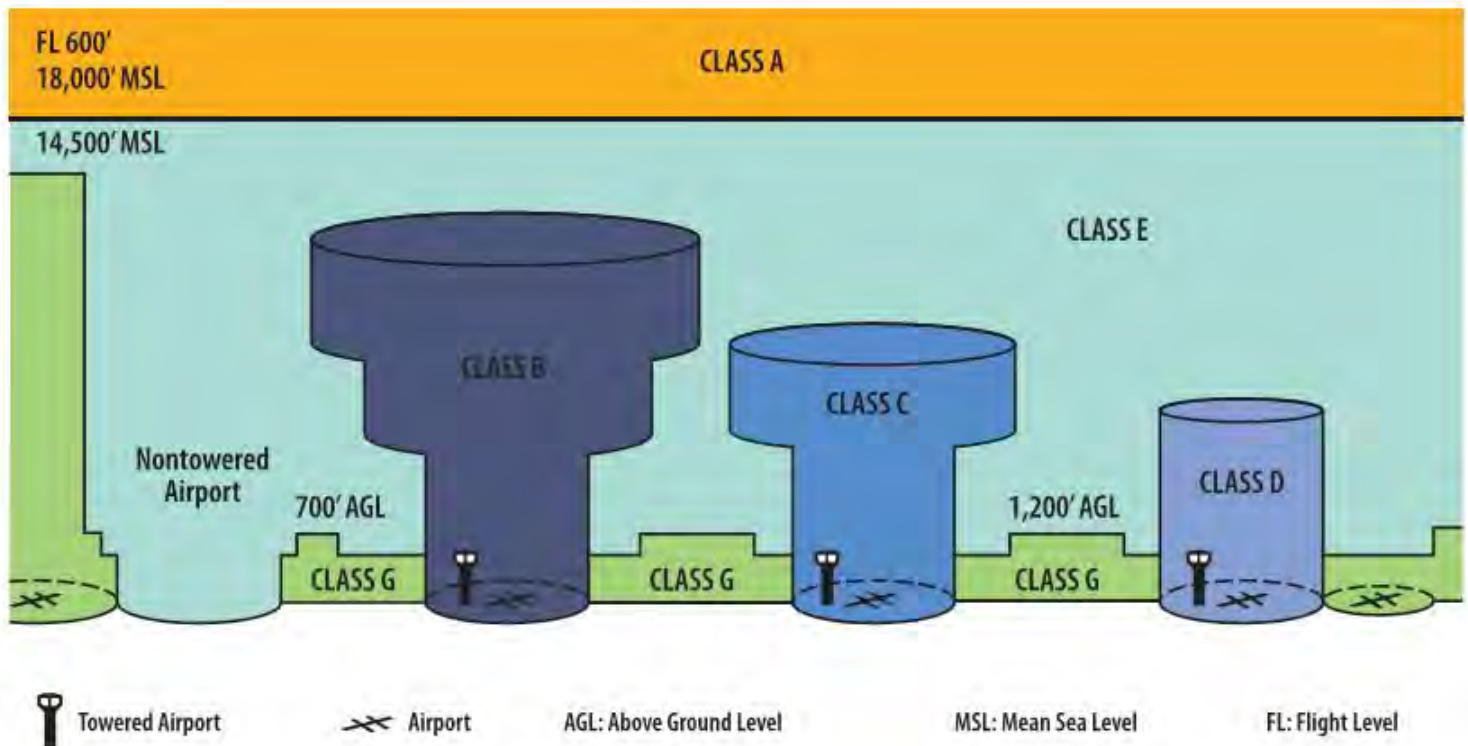
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Airspace Class	Communication with Air Traffic Control (ATC)	Entry Requirements	Seperation Services	Special VFR in Service Area
A	Required for All Operations	ATC Clearance	All	N/A (No Surface Area)
B	Required for All Operations	ATC Clearance	All	Yes
C	Required for All Operations	Two-way Communications Required Prior to Entry	VFR/IFR	Yes
D	Required for All Operations	Two-way Communications Required Prior to Entry	Runway Operations	Yes
E	Required for All Operations	Required for IFR Operations	Required for IFR Opeartions Only	Yes
G	Not Required	None	None	N/A (No Surface Area)

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AIRFIELD GRADING, DRAINAGE, AND STORMWATER MANAGEMENT

The Airport is located within the Black Wash floodplain limits mapped by Federal Emergency Management Agency (FEMA). According to the Tucson Airport Authority RYN Drainage Improvements Project Environmental Determination, dated October 2017, the existing drainage conveyance on the eastern portion of the Airport uses an earthen berm, natural channels, and box culverts located near the approach end of Runway 24L to deliver runoff to a drainage swale located on the north side of the airfield. During rain events, the culverts located under the Runway 24L runway safety area become clogged due to debris and cause flooding within the aircraft operations area and surrounding areas. Onsite private utility lines are references from mapped record information received from TAA. The known Airport drainage structures are shown in **Figure 1-7**.

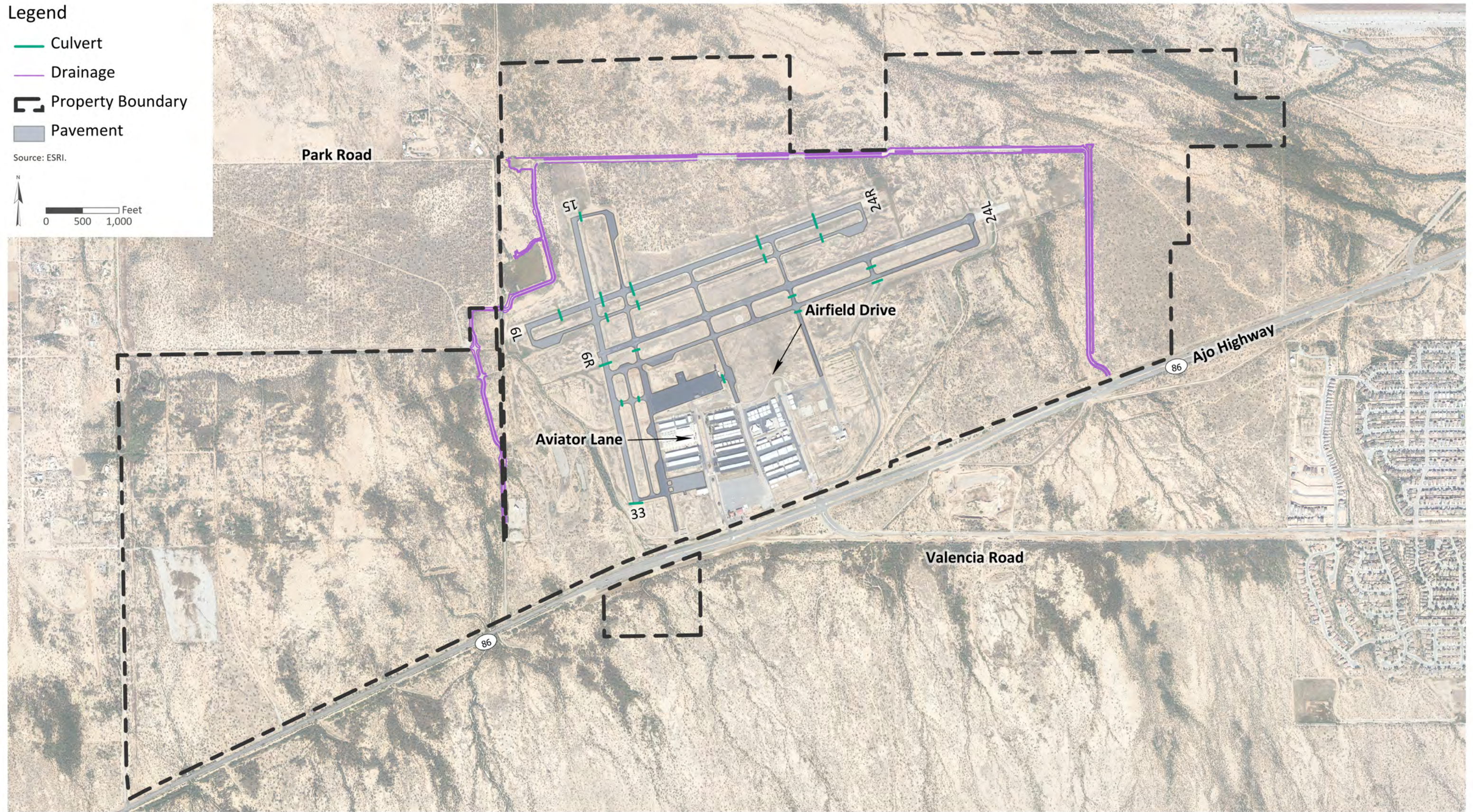
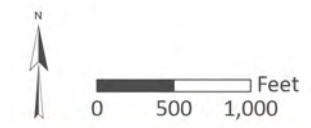
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Legend

- Culvert
- Drainage
- Property Boundary
- Pavement

Source: ESRI.



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LANDSIDE FACILITIES

AIRPORT TENANT BUILDINGS AND GROUND FACILITIES

Landside facilities are the ground-based facilities that support the aircraft, pilot, and passenger handling functions. These facilities typically include aircraft storage/maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, and roadway access.

AIRPORT PROPERTY INTERESTS

The RYN property includes 1,804 acres that encompass the airside and landside of RYN. An 80.8-acre parcel of land identified for acquisition in the previous Master Plan was purchased in 2018.

The previous master plan identified two additional parcels for property acquisition. The first is a 39.6-acre parcel north of Runway 6L/24R. The second parcel identified for purchase was 3.1 acres in the Runway 6L RPZ. The proposed land acquisitions are being carried forward to be included as part of the Exhibit “A” property map and land use.

VEHICLE PARKING AND CIRCULATION

Airport Entrance Roadways, Access Points, and Circulation

RYN is located along the northern side of West Tucson-Ajo Highway with full access to the highway at Airfield Drive/West Valencia Road. The portion of Ajo highway from the Airport to the east is being widened from a two-lane road to a four-lane divided highway. A right in and right out access point is to the west at South Aviator Lane. West Valencia Road runs parallel to West Tucson-Ajo Highway within the Airport property between South Aviator Lane and Airfield Drive. The frontage road provides access to West Tucson-Ajo Highway for all existing vehicular roads within the Airport property.

Airfield Vehicle Access Routes

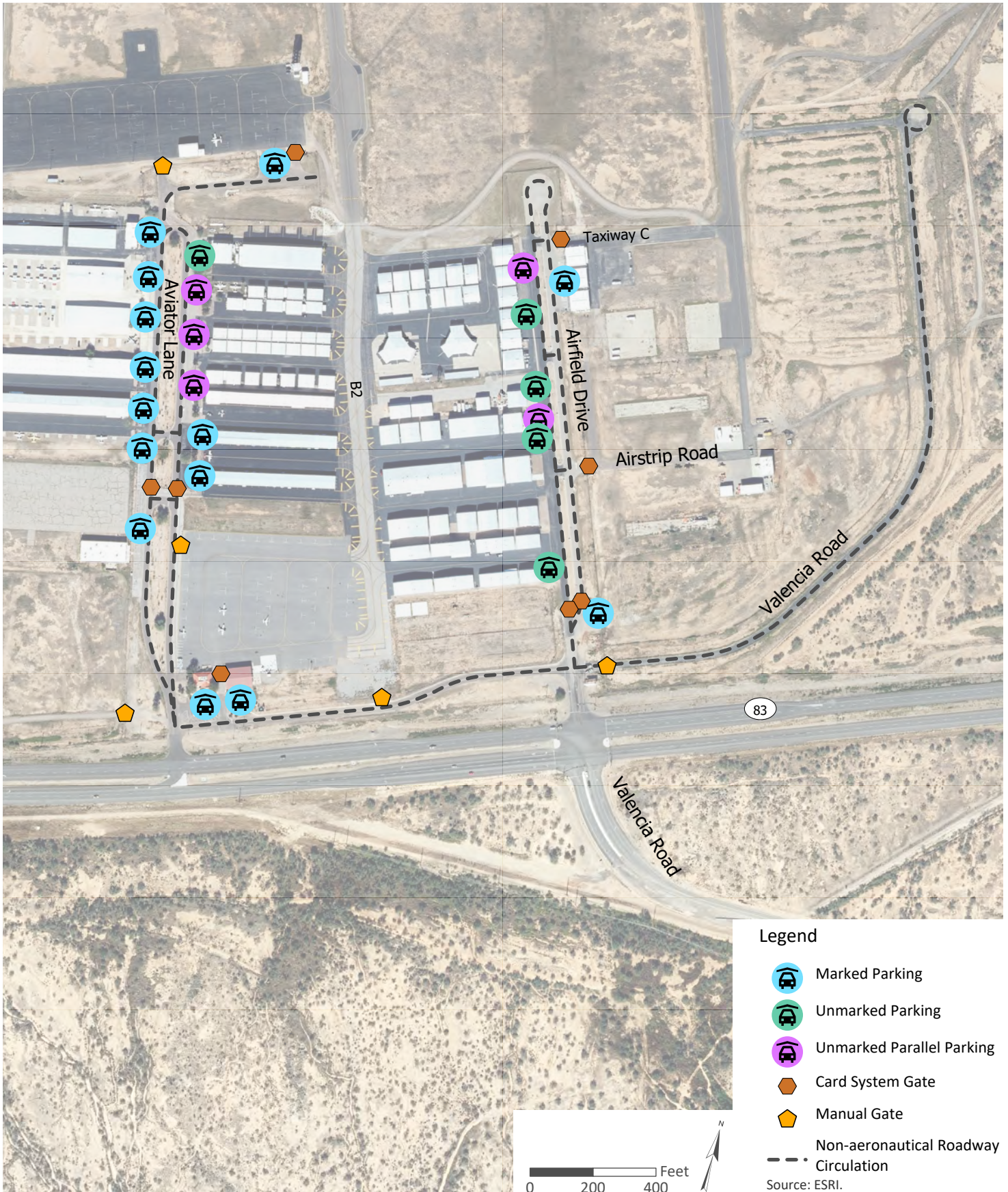
Airfield Road is a paved two-lane road that provides access to several on-airport specialty operators and hangar facilities. South Aviator Lane is a divided two-lane paved road that provides access from Ajo Highway to the ATCT, as well as several other specialty operators and hangar facilities. The paved roadway that runs parallel to Ajo Highway connects with South Aviator Lane and Airfield Drive.

Vehicle Parking Lots

Marked and unmarked parking for vehicles is provided along both sides of South Aviator Lane and Airfield Drive. A small parking lot located at the northeast corner of the terminus of South Aviator Lane is adjacent to the plane tie-downs at the control tower. Another parking lot is located at the northeast corner of West Valencia Road and South Aviator Lane in front of the existing restaurant and facility offices. **Figure 1-8** shows the available vehicle parking and public access roads on the Airport.

Perimeter Fencing and Gates

The airport perimeter is equipped with 6-foot chain-link fencing with three strands of barbed wire. Chain-link security fencing separates hangars and the terminal area from public areas. The terminal has automated access gates located throughout equipped with remote security control. Manually operated gates are padlocked to restrict access to authorized personnel. The updated Part 77 surfaces map will be included in the new Airport Layout Plan (ALP) after alternatives have been evaluated.



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NON-AERONAUTICAL

Buildings and Uses

Table 1-6 lists the existing Airport buildings with reference to the ALP numbers, on-site building number, building type, condition, and year the building was constructed. This includes sites for fuel, ATCT, and utilities on the Airport.

Table 1-6: Airport Buildings

RYAN AIRFIELD BUILDING INVENTORY				
2011 RYN ALP Building #	Building No. (New)	Building Type	Building Sq. Ft.	Year Built
1	E-101	Flight School	8,600	1992
2	E-102	T-Hangars	25,402	1983
3	E-103	Conventional Hangar	28,966	1989
4	E-104	Nose Shade Hangars	NA	1986
5	E-105	Hangar Office	12,300	1988
6	E-106	Hangar Office	12,570	1987
7	E-107	Hangar Office	12,450	1986
8	E-108	Hangar Office	8,960	1986
9	E-109	Office Building	2,900	1986
10	E-110	Restaurant	2,747	1985
11	E-111	RYAN Administration Building	4,424	2005
12	E-112	Self-Serve Fueling Facility	NA	1988
13	E-113	Shade Hangars	16,800	1981
14	E-114	Shade Hangars	16,800	1981
15	E-115	Conventional Hangar	14,580	1995
16	E-116	Hangar Office	2,000	1994
17	E-117	Hangar Office	1,760	1994
18	E-118	Hangar Office	1,760	1994
19	E-119	Hangar Office	1,760	1994
20	E-120	Hangar Office	1,760	1994
21	E-121	Hangar Office	2,000	1994
22	E-122	Hangar Office	2,000	1994
23	E-123	Hangar Office	1,548	1991
24	E-124	Hangar Office	1,548	1991
25	E-125	Hangar Office	1,548	1991
26	E-126	Hangar Office	1,548	1991
27	E-127	Hangar Office	1,548	1991
28	E-128	Hangar Office	1,548	1991
29	E-129	Hangar Office	1,548	1991
30	E-130	Hangar Office	1,548	1991
31	E-131	Hangar Office	1,548	1991
32	E-132	Hangar Office	1,548	1991
33	E-133	Hangar Office	1,548	1991
34	E-134	Hangar Office	1,548	1991
35	E-135	Hangar Office	1,548	1991
36	E-136	Hangar Office	1,548	1991
37	E-137	Hangar Office	1,548	1991
38	E-138	Hangar Office	1,548	1991
39	E-139	Hangar Office	1,880	1994

RYAN AIRFIELD BUILDING INVENTORY				
2011 RYN ALP Building #	Building No. (New)	Building Type	Building Sq. Ft.	Year Built
40	E-140	Conventional Hangar	1,850	1994
41	E-141	Conventional Hangar	1,850	1994
42	E-142	Conventional Hangar	1,850	1994
43	E-143	Conventional Hangar	1,850	1994
44	E-144	Conventional Hangar	1,850	1994
45	E-145	Conventional Hangar	1,850	1994
46	E-146	Conventional Hangar	1,850	1994
47	E-147	Conventional Hangar	1,850	1994
48	E-148	Hangar Office	3,850	1989
49	E-149	Wash Rack	2,759	1995
50	E-150	Hangar Office	17,760	1983
51	E-151	Hangar Office	4,960	2006
52	E-152	Hangar Office	4,960	2006
53	E-153	Hangar Office	4,960	2006
54	E-154	Conventional Hangar	3,000	2006
55	E-155	Hangar Office	4,960	2006
56	E-156	Hangar Office	4,960	2006
57	E-157	Hangar Office	4,960	2006
58	E-158	Conventional Hangar	3,000	2006
59	E-159	Conventional Hangar	7,560	2003
60	E-160	Conventional Hangar	3,600	2003
61	E-161	Conventional Hangar	3,600	2004
62	E-162	Conventional Hangar	3,600	2004
63	E-163	Conventional Hangar	3,600	2004
64	E-164	Conventional Hangar	3,600	2003
65	E-165	Conventional Hangar	19,706	2001
66	E-166	Conventional Hangar	9,700	2003
67	E-167	Conventional Hangar	6,330	2003
68	E-168	Conventional Hangar	3,600	2002
69	E-169	Conventional Hangar	3,600	2002
70	E-170	Conventional Hangar	3,600	2004
71	E-171	Conventional Hangar	9,300	2004
72	E-172	Box Hangar W/Office	4,450	2004
73	E-173	Box Hangar	2,600	2001
74	E-174	Box Hangar	2,600	2001
75	E-175	Box Hangar	1,680	1998
76	E-176	Box Hangar	3,000	1996
77	E-177	T-Hangars	6,798	1995
78	E-178	T-Hangars	6,798	1995
79	E-179	Conventional Hangar	2,400	1996
80	E-180	Conventional Hangar	3,000	1996
81	E-181	Conventional Hangar	3,000	1996
82	E-182	Conventional Hangar	2,520	1996
83	E-183	Conventional Hangar	3,000	1996
84	E-184	Conventional Hangar	2,500	1996
85	E-185	Conventional Hangar	2,520	1996
86	E-186	Conventional Hangar	3,000	1996
87	E-187	Conventional Hangar	2,520	1996
88	E-188	Conventional Hangar	3,000	1996
89	E-189	Conventional Hangar	3,000	1996
90	E-190	Conventional Hangar	2,400	1996
91	E-191	Conventional Hangar	4,800	1997
92	E-192	Conventional Hangar	3,555	1996

RYAN AIRFIELD BUILDING INVENTORY				
2011 RYN ALP Building #	Building No. (New)	Building Type	Building Sq. Ft.	Year Built
93	E-193	Conventional Hangar	3,560	1996
94	E-194	Conventional Hangar	3,650	1996
95	E-195	Conventional Hangar	3,560	1996
96	E-196	Conventional Hangar	3,540	1996
97	E-197	Hangar Office	3,600	1999
98	E-198	Hangar Office	3,600	1999
99	E-199	Hangar Office	3,600	1999
100	E-200	Maintenance Facilities	5,490	1988
102	E-201	Electrical Vault	NA	NA
103	E-202	AWOS	NA	NA
104	E-203	Localizer	NA	NA
105	E-204	Glideslope Antenna	NA	NA
108	E-205	Air Traffic Control Tower	NA	1992
101	F-100	Solid Waste Transfer Station	2,400	NA
106	G-100	Water Tank	NA	NA
107	G-101	Generator	NA	NA

Vacant Land

There are 626 acres of non-aeronautical land lie within the RYN boundary. Of that area, 311 acres are located to the north of the runway and 314 acres south. The vacant land south of the runway has 10,919 linear feet of highway frontage. Land uses on and around the airport are discussed in greater detail in the environmental review section of this chapter. **Figure 1-9** illustrates the Airport's vacant land areas and Ajo Highway frontage.

UTILITIES

Utilities provide the necessary foundation for development projects. Without widely available and reliable electrical, water, telecommunications/fiber optics, natural gas, wastewater, and drainage infrastructure, expansions and improvements can difficult. **Table 1-7** summarizes the service providers, system capabilities, and conditions. **Figure 1-10** identifies the utility systems in place and their capability to serve the current site layout and future development projects.

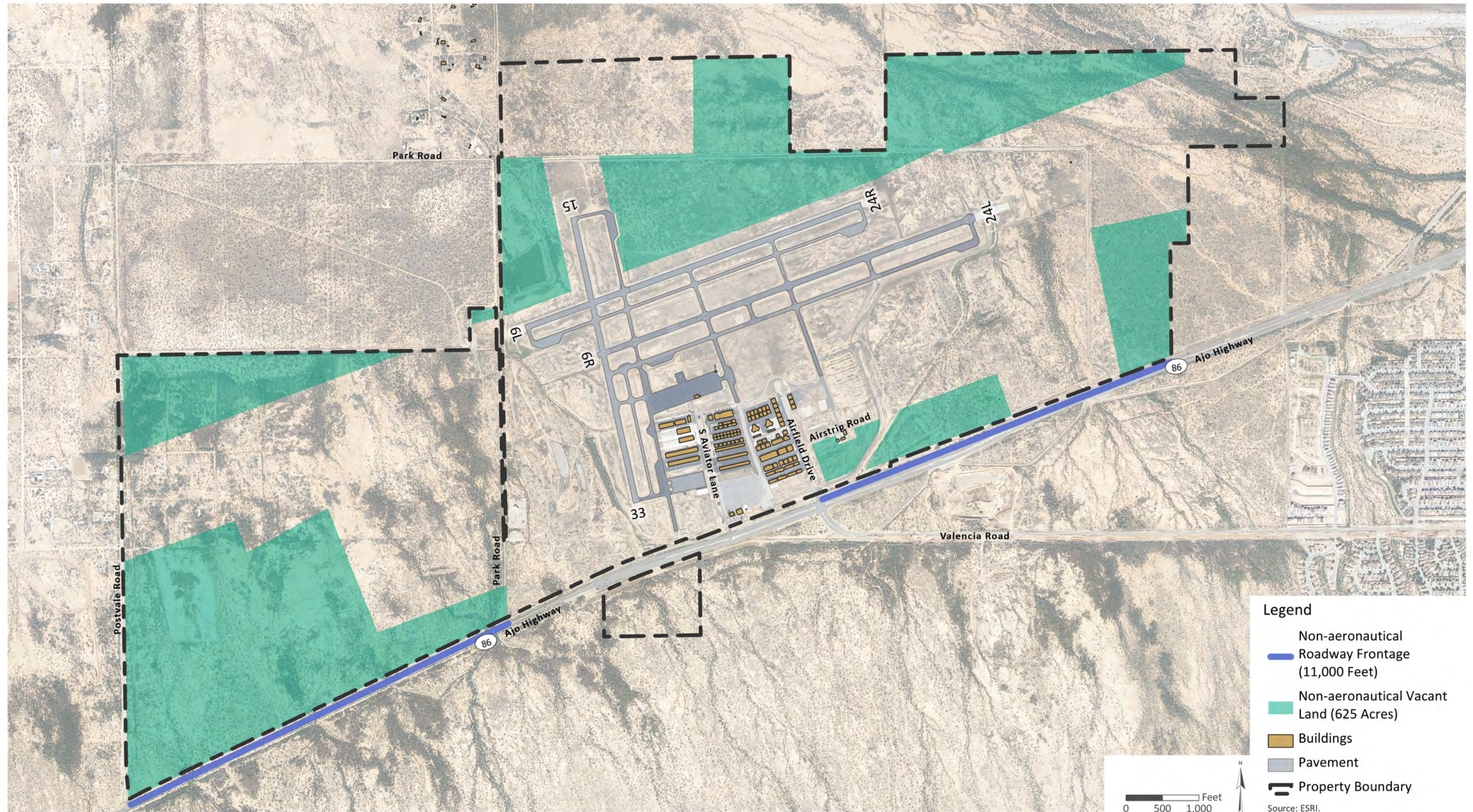
ELECTRICAL

Tucson Electric Power (TEP) provides electric service to the Airport. Power is transmitted via two main connections from the TEP distribution lines located at the Valencia Road/Ajo Highway intersection. The onsite power is conducted through underground lines around the main facilities and an overhead line between Airfield Drive and the easternmost taxiway access road. An existing line also runs on the northwest side of the property along Park Road. Onsite private utility lines have been taken from mapped record information received from TAA and TEP. Electric utility lines serving the Airport are shown in **Figure 1-11**.

Table 1-7: Existing Available Utilities Near the Airport

Utility	Provider	System / Capacities / Remarks	Condition / Deficiencies
Electric Power	Tucson Electric Power	Tri Co – west side Tucson Electric – east side	Combination of underground lines to Airport and overhead lines near Airfield Dr.
Water	Tucson Water	A 12" main water line runs along Ajo Highway and 8" water lines for domestic and fire protection	None reported
Sanitary Sewer	Pima County Wastewater Reclamation Department	No sewer system, but 8" lines connect to nine septic tanks and leach fields	None reported
Gas	Southwest Gas	6" high pressure main gas lines along Ajo Highway and 2" utilities along Airfield Dr.	None reported
Stormwater Systems	Ryan Airport	Series of earthen berms, channels, and box culverts connect to drainage swale on north side of airfield	See Inventory Environmental Review section on Airport drainage.
Solid Waste Removal	Tucson Recycling and Waste Services	Solid waste disposal pickup is once a week at Airport businesses and dumpsters	None reported
Communications (Telephone)	Cox Communications / CenturyLink	Phone lines/fiber optics	None reported
Communications (Data)	CenturyLink	DSL and fiber optics	None reported

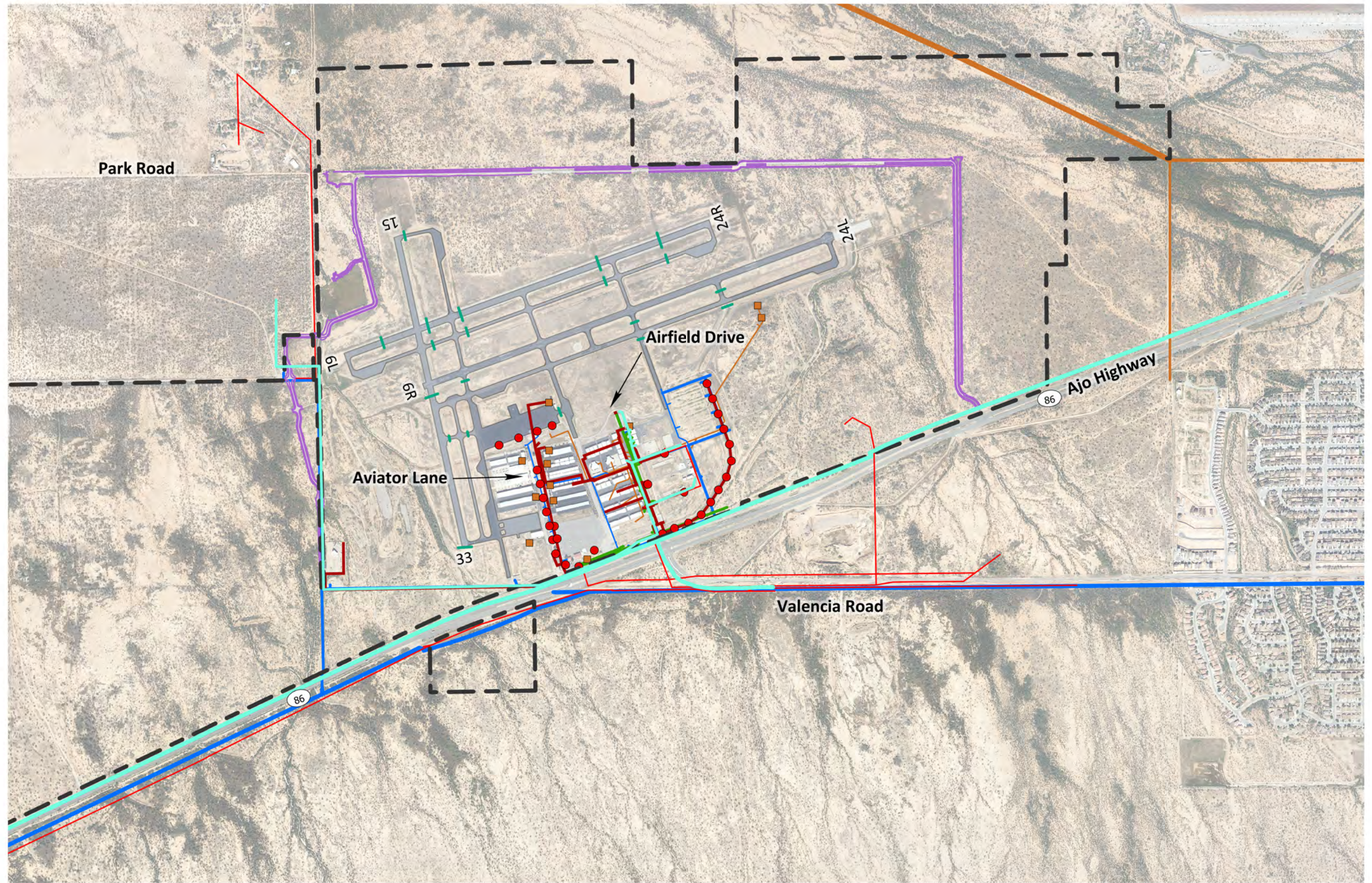
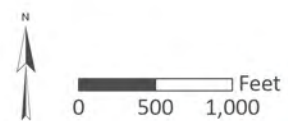
Source: PSOMAS Engineering Consulting



Legend

- Power Pole
- Overhead Electric
- Underground Electric
- Communications
- Culvert
- Drainage
- Natural Gas
 - 2 in
 - 6 in
- Water
 - 8 in
 - 12 in
 - 42 in
- Sewer
 - 8 in
 - 12 in
 - 18 in
 - 21 in
- Septic
- ▭ Property Boundary
- ▭ Pavement

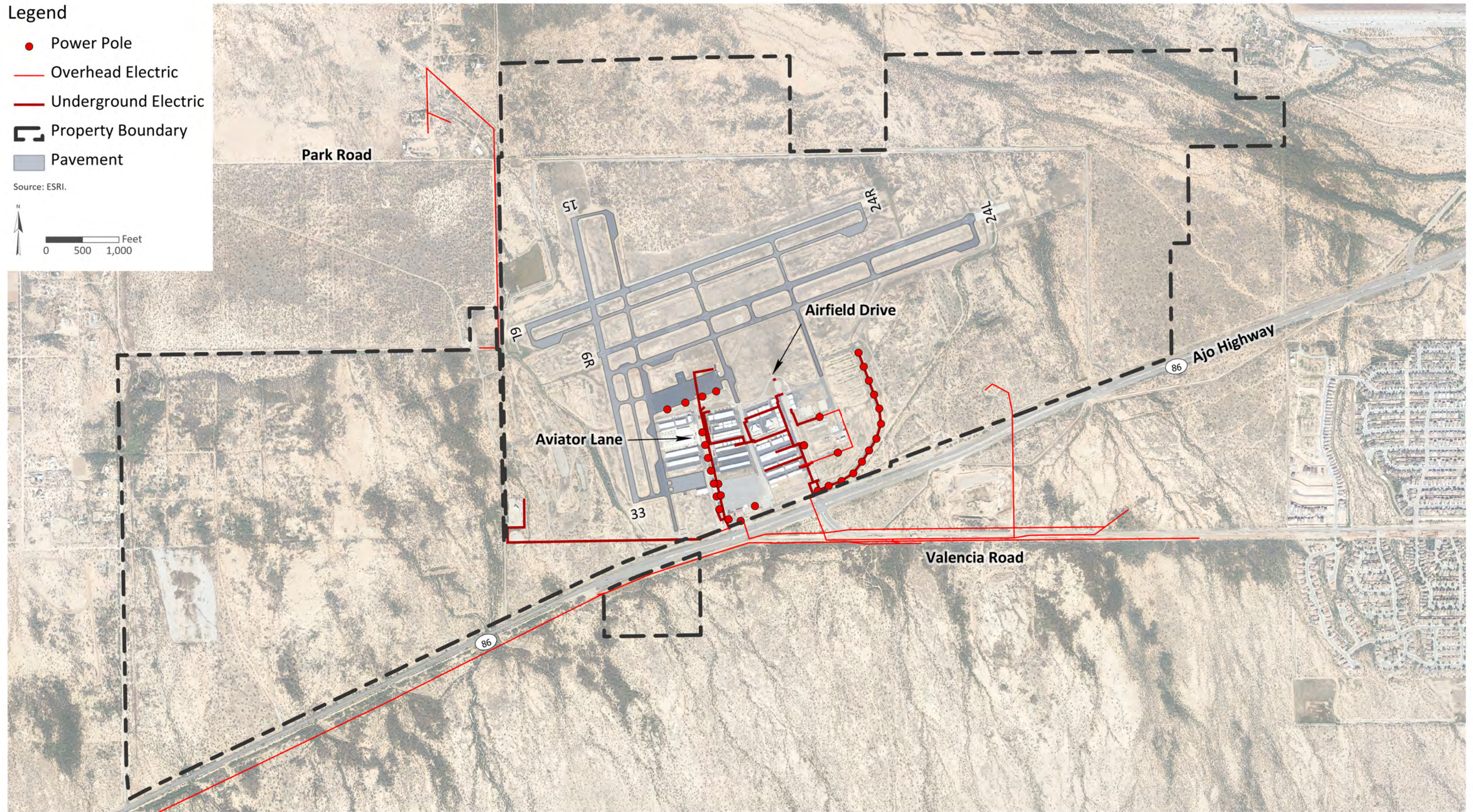
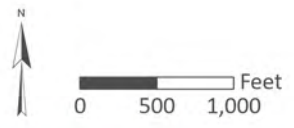
Source: ESRI.



Legend

- Power Pole
- Overhead Electric
- Underground Electric
- ▬ Property Boundary
- Pavement

Source: ESRI.



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WATER

Tucson Water is the designated municipal water service provider for the Airport. Three existing water production wells surround the area. One is located on the northwestern portion of the property with a 12-inch polyvinyl chloride (PVC) water line that traverses the site north to south. This water line connects to a 42-inch water main line running along Valencia Road. The other two of them are located inside the southwest property corner and serve the Airport through a 12-inch PVC main water line running east to west, then along the property boundary, then north to the easternmost taxiway access road. Five 8-inch PVC lines for water distribution around the developed area provide looped connections to the 12-inch main line. Also, five monitor wells are located on the eastern side and one abandoned well is closer to Airfield Drive. Onsite private utility lines are taken from mapped record information received from TAA, Tucson Water, and the Arizona Department of Water Resources. Water utility lines and wells located near the Airport are shown in **Figure 1-12**.

TELECOMMUNICATIONS/FIBER OPTICS

The Airport is served through local telecommunications and fiber optic providers Cox Communications and CenturyLink. Although no fiber has been placed by the City of Tucson, private companies such as Cox Communications and CenturyLink purchase conduits and deploy fiber optic connectivity for commercial needs. Additional coordination with the providers will be needed for more information regarding specific location and connectivity since neither provider responded to numerous requests for their system's utility maps. Onsite private utility lines have been taken from mapped record information received from TAA only. Telecommunications / fiber optic lines serving the Airport are shown in **Figure 1-13**.

NATURAL GAS

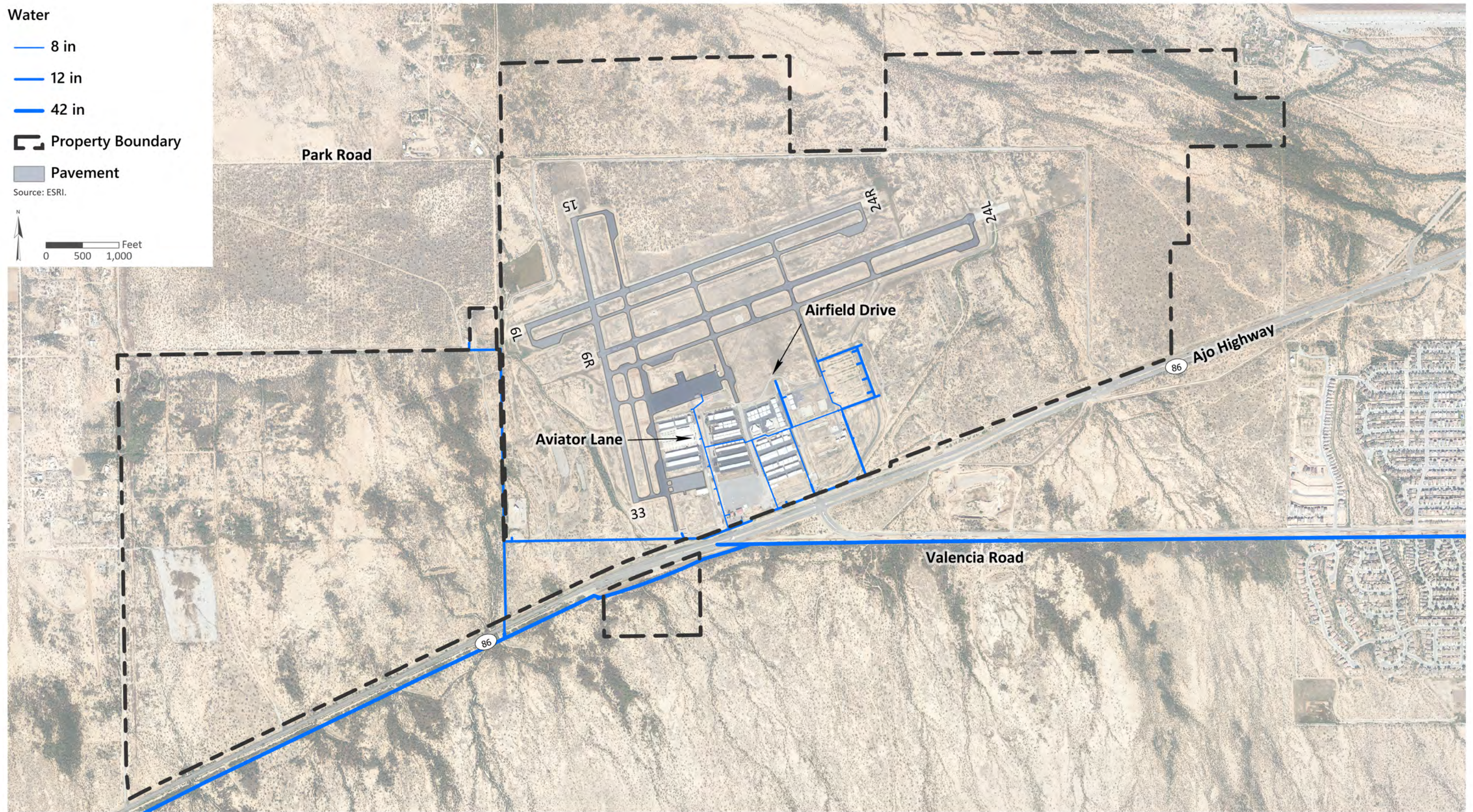
Southwest Gas provides natural gas for the Airport. A 6-inch high-pressure main line runs along Ajo Highway and distributes to a 2-inch lateral connection that runs along Airfield Drive to serve the Airport facilities. Onsite private utility lines have been taken from mapped record information received from TAA and Southwest Gas. Natural gas utility lines serving the Airport are shown in **Figure 1-14**.

WASTEWATER

The TAA wastewater system consists of multiple 8-inch PVC lines connected to nine septic tanks and leach fields located in various areas of the Airport. Pima County Wastewater Reclamation Department (PCRWRD) collects and treats wastewater for the incorporated areas of the city, including the Airport. An existing PCRWRD 21-inch PVC sewer line is located approximately 1 mile from the Airport. This line could be a potential connection for a gravity sewer system onsite. Note that an agreement is in place with an upstream private development community to jointly design and construct a public outfall sewer to replace the current septic system infrastructure. Onsite private utility lines have been taken from mapped record information received from TAA and PCRWRD. Wastewater utility lines serving the Airport and the surrounding existing sewer lines are shown in the **Figure 1-15**.

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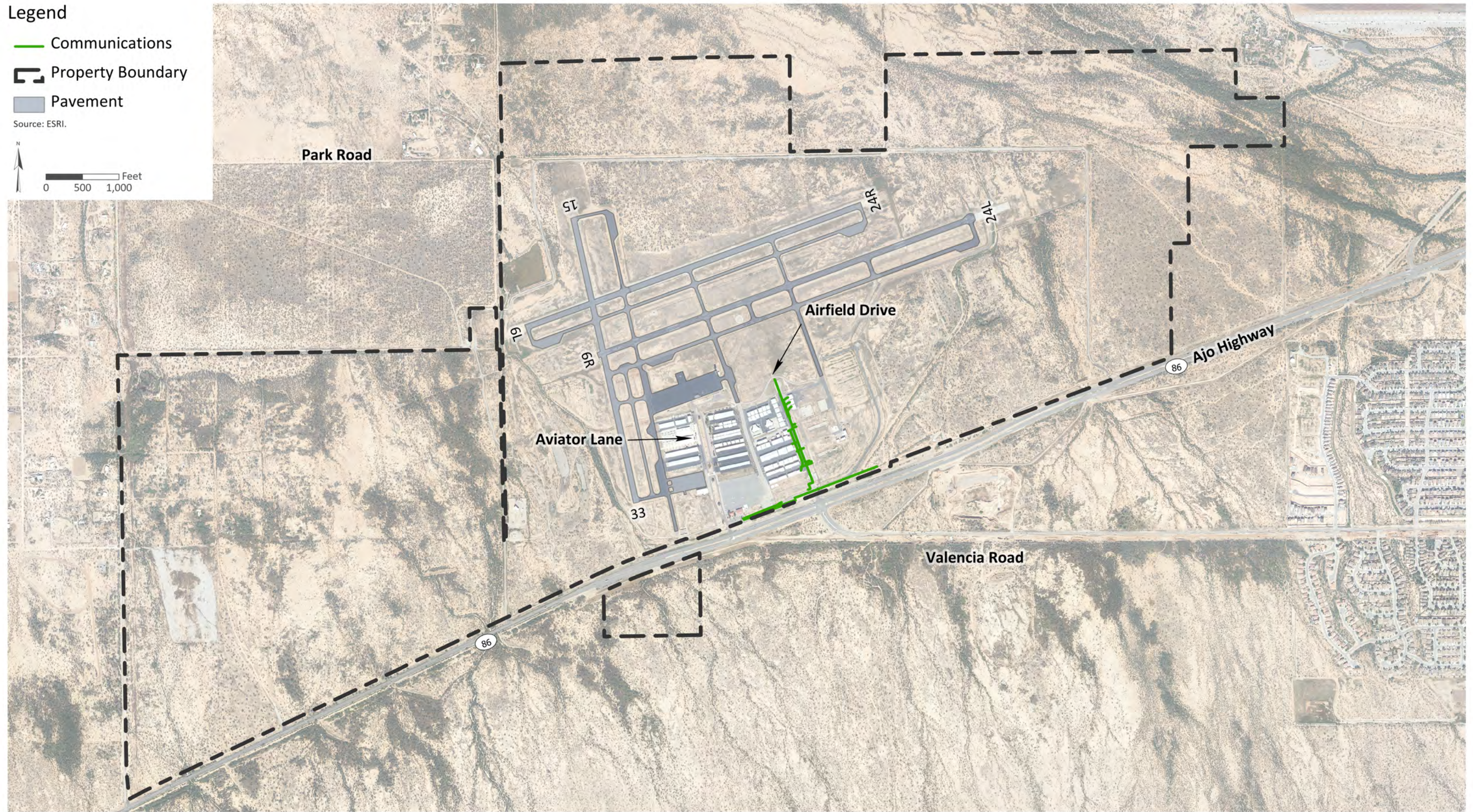
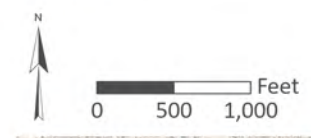




Legend

- Communications
- Property Boundary
- Pavement

Source: ESRI.



Legend

Natural Gas

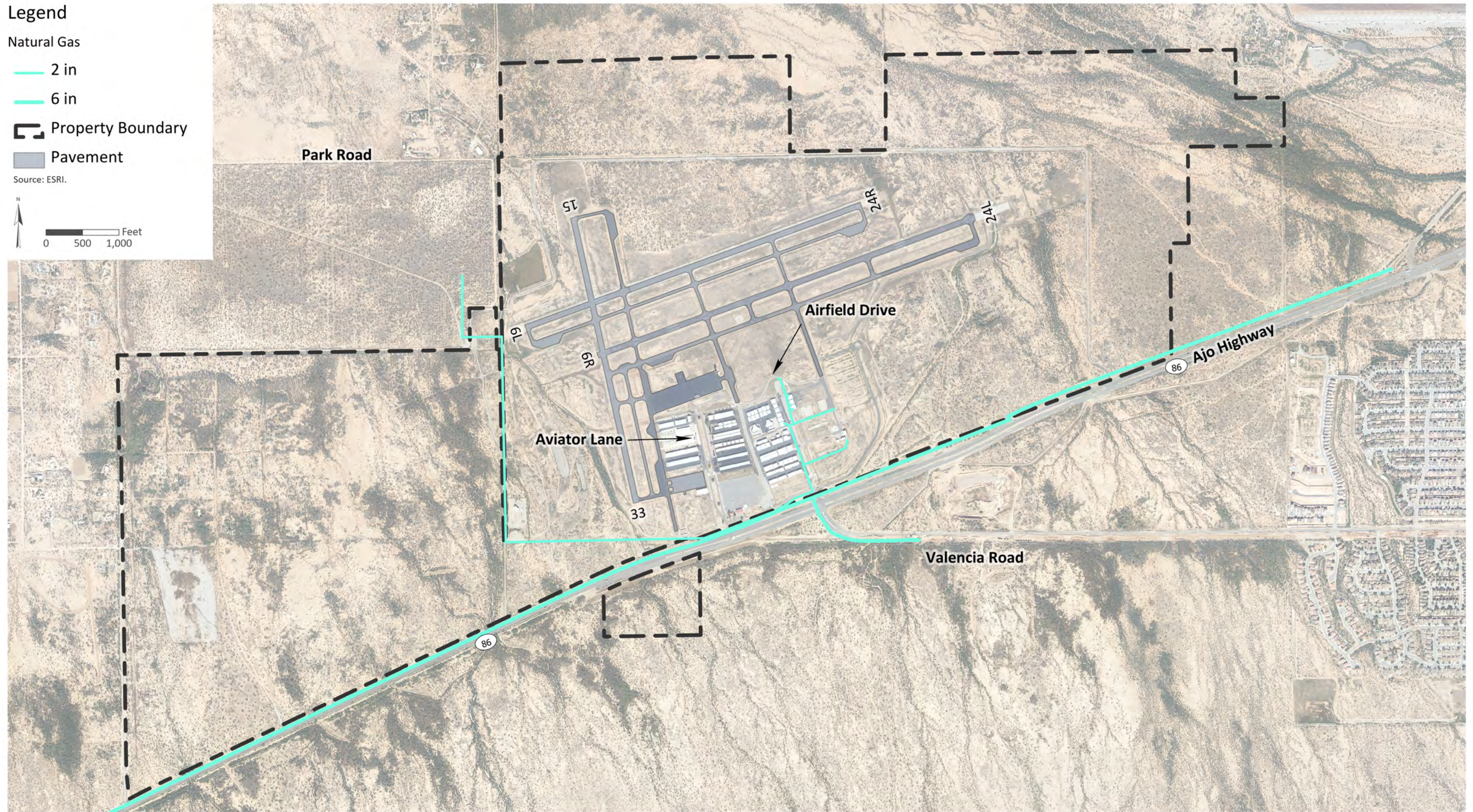
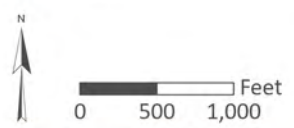
2 in

6 in

Property Boundary

Pavement

Source: ESRI.

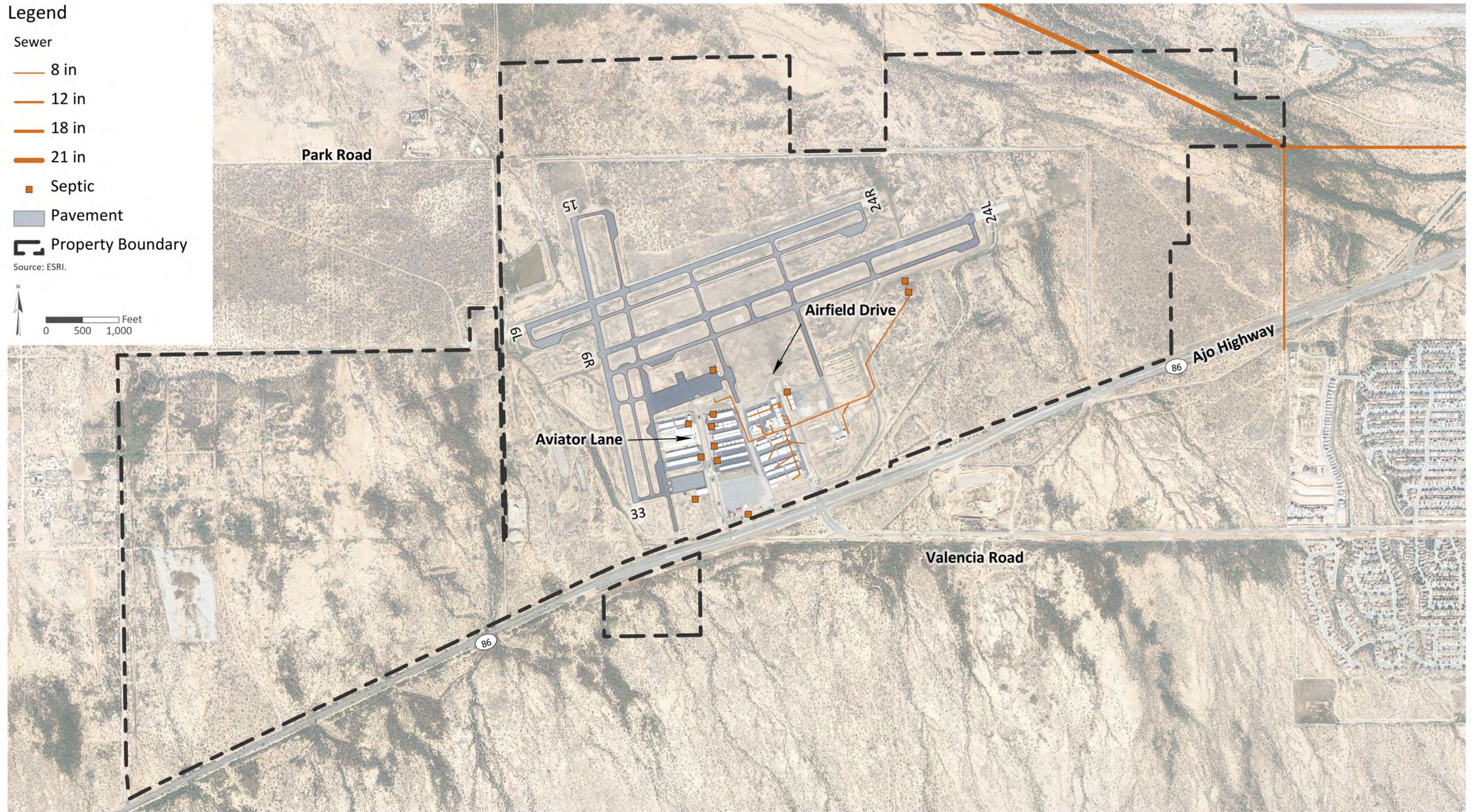


Legend

- Sewer
- 8 in
 - 12 in
 - 18 in
 - 21 in
 - Septic
 - Pavement
 - Property Boundary

Source: ESRI.

0 500 1,000 Feet



WIND ANALYSIS

Historical prevailing wind factors influence runway orientation and use. An airport's primary runway should align with prevailing winds as the FAA has determined that crosswinds are a hazard to the safe operation of aircraft, especially for small and light aircraft.

Wind coverage is defined as the average percentage of time that a runway or group of runways are exposed to crosswind components. **Table 1-8** shows FAA crosswind components categorized by approach category and design group. Crosswind components can exceed the ability of aircraft to maintain control. Light aircraft have a crosswind component of 10.5 knots. Larger aircraft have crosswind components of 13, 16, or 20 knots. The FAA defines the desirable minimum wind coverage of an airport's runway configuration as 95 percent usability based on wind velocity and direction observations from the last 10 consecutive years. The allowable crosswind component used to determine wind coverage for a runway is based on the ARC of the most demanding aircraft expected to use the runway.

Wind data is reported to the National Oceanic and Atmospheric Administration by the AWOS-3 located at RYN. The FAA's online Wind Rose Generator and Wind Analysis programs were used to determine the wind coverage for RYN's runway orientations, both individually and combined.

Runway 6/24 has higher wind coverage across all components when compared to Runway 15/33. Neither runway provides adequate wind coverage for 10.5-knot and 13-knot crosswind components for All-Weather, IFR, or Visual Flight Rules (VFR). The crosswind runway is justified in order to meet the 95 percent wind coverage. The wind coverage provided by the primary and crosswind runways, when combined, does provide adequate wind coverage in all components and conditions. The 20-knot crosswind component for ADG IV-VI aircraft exceed the design criteria at RYN and is not included as part of the design category requirements. **Table 1-9** summarizes the allowable crosswind component based on RDC for different aircraft categories. **Figure 1-16** depicts the wind rose charts for All Weather and IFR conditions at RYN.

Table 1-8: Wind Coverages

Runway	10.5-Knot Component	13-Knot Component	16-Knot Component	20-Knot Component
ALL-WEATHER WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 6/24	93.65%	97.01%	99.26%	99.82%
Runway 15/33	89.29%	94.00%	98.12%	99.53%
Runway 6/24 & Runway 15/33 Combined	98.18%	99.58%	99.91%	99.98%
INSTRUMENT WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 6/24	91.17%	95.23%	97.52%	98.60%
Runway 15/33	89.49%	93.71%	97.64%	99.43%
Runway 6/24 & Runway 15/33 Combined	97.68%	99.06%	99.77%	100.00%
VISUAL WIND DATA OBSERVATIONS (PERCENT COVERAGE)				
Runway 6/24	93.73%	97.04%	99.28%	99.83%
Runway 15/33	89.48%	94.11%	98.16%	99.55%
Runway 6/24 & Runway 15/33 Combined	98.21%	99.58%	99.91%	99.98%

BOLD indicates less than FAA required 95% coverage

NOTE: CROSSWIND COMPONENT COMPUTED USING RUNWAY TRUE BEARINGS (70.19, 167.58)

NOTE: CROSSWIND COMPONENT COMPUTED USING AGIS SURVEY INFORMATION FROM QUANTUM

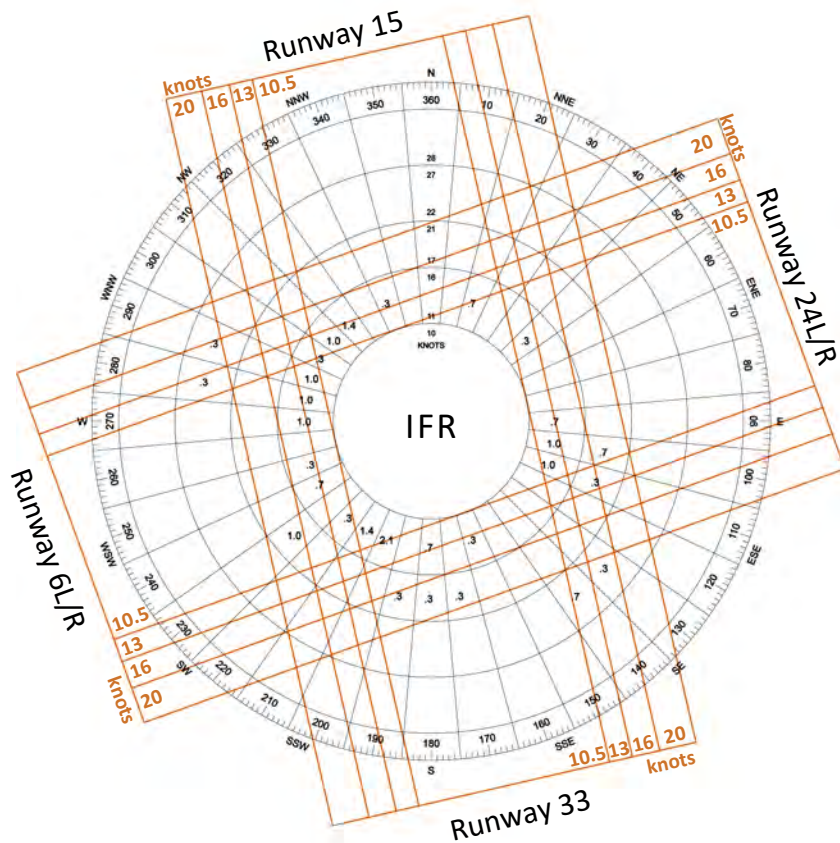
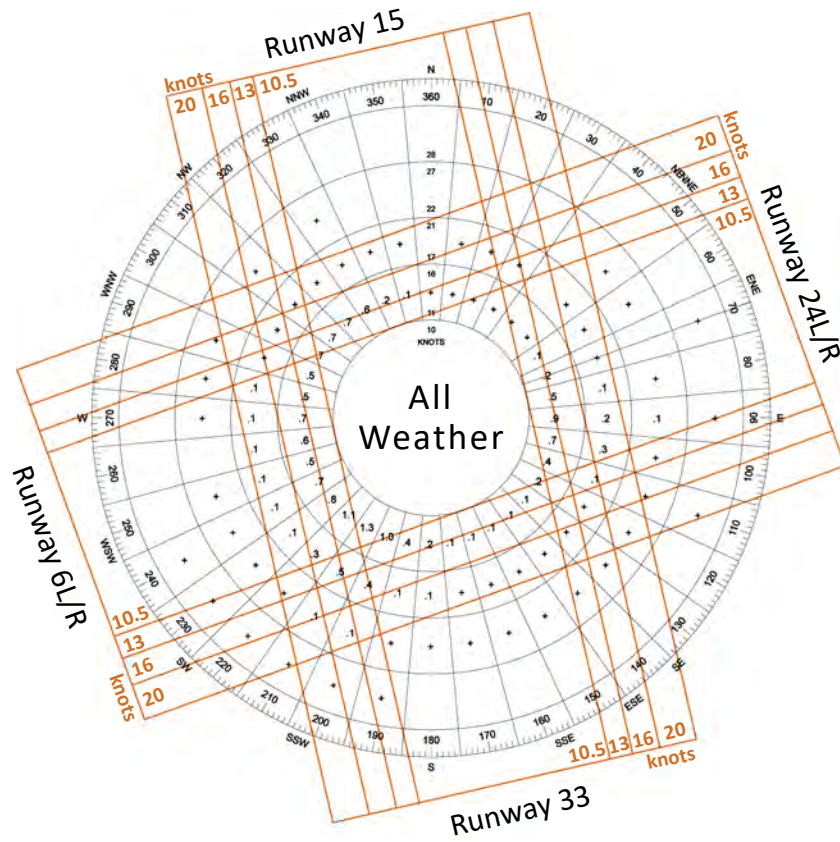
NOTE: ALL WEATHER CONDITIONS: PERIOD OF RECORD: JULY 2019 WITH 39153 OBSERVATIONS.

NOTE: IFR WEATHER CONDITIONS: PERIOD OF RECORD: JULY 2019 WITH 289 OBSERVATIONS.

NOTE: VFR WEATHER CONDITIONS: PERIOD OF RECORD: JULY 2019 WITH 37127 OBSERVATIONS.

Table 1-9: Allowable Crosswind Component

RDC	Allowable Crosswind Component
A-I and B-I	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through C-III, D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI	20 knots
E-I through E-VI	20 knots



Source: FAA.

All Weather & IFR Wind Rose

Figure 1-16

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ENVIRONMENTAL OVERVIEW

The Environmental Overview for RYN provides a preliminary review and initial screening of environmental resources located on or near the Airport. Provided that aeronautical requirements are met, the data provided in the overview will be considered to avoid or minimize potential effects to environmental resources during the formulation of project alternatives. The environmental resources and conditions presented in the Environmental Overview were identified through a review of available published documents and supplemented through limited field investigation activities. The Environmental Overview identifies resources or issue areas that will require evaluation prior to project approvals.

The following environmental resources/issue areas were considered in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*:

- ▶ Air Quality
- ▶ Biological Resources (Threatened and Endangered Species)
- ▶ Climate
- ▶ Coastal Resources
- ▶ Department of Transportation Act, Section 4(f)
- ▶ Farmland
- ▶ Hazardous Materials, Solid Waste, and Pollution Prevention
- ▶ Historical, Architectural, Archaeological, and Cultural Resources
- ▶ Land Use
- ▶ Natural Resources and Energy Supply
- ▶ Noise and Noise Compatible Land Use
- ▶ Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- ▶ Visual Effects (Light Emissions / Visual Resources)
- ▶ Water Resources (Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Although FAA Order 1050.1F requires the consideration of coastal resources as an environmental resource, coastal resources and coastal barriers are not discussed in the Environmental Overview for RYN because the Airport is located approximately 135 miles from the Gulf of California, the nearest coastal resource. This resource is not discussed further.

AIR QUALITY

An air quality analysis is the measure of the condition of the air in terms of pollutant concentrations. Air quality is regulated out of concern for human health – especially the health of children, the elderly, and those with certain health conditions. The United States Environmental Protection Agency (USEPA) is charged with implementing the Clean Air Act. The Office of Air Quality Planning and Standards established the National Ambient Air Quality Standards (NAAQS) for specific pollutants known as priority pollutants (ozone, particulate matter, sulfur dioxide, lead, carbon monoxide, and nitrogen dioxide). States develop USEPA-approved State Implementation Plans to address air quality and identify a plan to bring non-attainment and maintenance areas into compliance.

The US EPA Green Book designates RYN as in “maintenance” for carbon monoxide and as “in attainment” for the remaining criteria pollutants under the NAAQS (USEPA 2019). An attainment area is one in which air pollution levels do not exceed the established NAAQS. A maintenance area is an area that was previously designated as a nonattainment area but has been re-designated because pollution levels have improved.

BIOLOGICAL RESOURCES

Section 7 of the Endangered Species Act of 1973, as amended, requires federal agencies to ensure that a proposed action does not jeopardize the continued existence of any endangered or threatened species or adversely affect its habitat. Project sponsors seeking federal agency approvals or funding must coordinate with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service concerning listed or candidate species.

The USFWS maintains a list of threatened and endangered species and critical habitat by state and county. The USFWS Information for Planning and Conservation website tool was reviewed to identify the potential presence of federally listed species at the Airport (USFWS n.d.). The Arizona Online Environmental Review Tool was used to identify state-listed species within the Brown Mountain quadrangle (AGFD 2019a). Seventeen special-status species were identified.

Table 1-10 summarizes the species identified and their status. As shown, five federally listed animal species, one federally listed plant species, and one candidate animal species were identified as having the potential to occur on or near the Airport. Eight state-listed animal species and seven state-listed plant species were also identified. No critical habitat was identified for the listed species.

Table 1-10: Species of Concern on and Near the Airport

Species	Scientific Name	Federal Status	State Status
Mammals			
Jaguar	<i>Panthera onca</i>	Endangered	S1
Sonoran Pronghorn	<i>Antilocapra Americana sonoriensis</i>	Endangered	S1
Birds			
California Least Tern	<i>Sterna antillarum browni</i>	Endangered	--
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Threatened	--
Reptiles			
Sonoran Collared Lizard	<i>Crotaphytus nebrius</i>	--	S3
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	Threatened	S2
Sonoran Lyresnake	<i>Trimorphodon lambda</i>	--	S2
Sonoyta Mud Turtle	<i>Kinosternon sonoriense longifemorale</i>	Endangered	S1
Amphibians			
Cave Myotis	<i>Myotis velifer</i>	Species of Concern	S3
Western Narrow-mouthed Toad	<i>Gastrophryne olivacea</i>	--	S3
Plants			
Mexican Broomspurge	<i>Euphorbia gracillima</i>	--	S3
Pima Pineapple Cactus	<i>Coryphantha scheeri var. robustispina</i>	Endangered	HS, S2
Pringle's Lip Fern	<i>Cheilanthes pringlei</i>	--	S3
Sparseleaf Hermannia	<i>Hermannia pauciflora</i>	--	S1
Sweet Acacia	<i>Acacia farnesiana</i>	--	S2
Tumamoc Globeberry	<i>Tumamoca macdougalii</i>	--	SR, S3
Tucson Mountain Spiderling	<i>Boerhavia megaptera</i>	--	S3
Key: Federal Status (U.S. Fish and Wildlife Service) Endangered - Imminent jeopardy of extinction. Threatened - Imminent jeopardy of becoming endangered. Species of Concern - Candidate for federal listing/protection. State Rank S1 - Critically Imperiled S2 - Imperiled S3 - Vulnerable Arizona Department of Agricultural Protect Plants - Classifications HS - Highly Safeguarded - No collection allowed SR - Salvage Restricted: collection only with permit		Sources: USFWS, 2019. Arizona Game and Fish Department, 2019a. Arizona Game and Fish Department, 2019b. Arizona Game and Fish Department, 2019c.	

The TAA undertook a biological evaluation in the southeastern portion of RYN in 2017 in support of Phase I Drainage Improvements. Published information obtained at that time identified 22 listed species that had the potential to occur on or near the Airport. The biological study performed in support of drainage improvements did not identify the presence of any listed species within the project area. Although one plant species, Pima pineapple cactus (PPC), was known to occur in the project vicinity, PPC was not observed in the project area during protocol-level surveys (SWCA 2017a). Several listed species are known to occur in the vicinity of the Airport, and site survey data is available only for the southeastern portion of the Airport property. Biological studies may be required to identify the presence and extent of listed surveys on and near the Airport and to determine whether proposed master plan projects have the potential to affect listed species and their habitats.

CLIMATE

The Council on Environmental Quality (CEQ) requires federal agencies, such as the FAA, to consider global climate change prior to the approval or funding of proposed projects (FAA 2015). Increased concentrations of greenhouse gases (GHGs) in the atmosphere can affect the global climate. GHGs are defined as including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). CEQ specifically asks agencies to consider:

- ▶ The potential effects of a proposed action on climate change as indicated by its GHG emissions; and
- ▶ The implications of climate change for the environmental effects of a proposed project.

U.S. DEPARTMENT OF TRANSPORTATION, SECTION 4(F)

Section 4(f) resources include public parks, recreational areas, wildlife or waterfowl refuges, and historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land off a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance, only if there is no feasible and prudent alternative to the using that land and the program or project includes all possible planning to minimize harm resulting from the use.

Several publicly available resources were reviewed to identify Section 4(f) resources in the vicinity of RYN to identify:

- ▶ Pedestrian, bicycle, or multiple-use recreational trails, trailheads, other recreational access points
- ▶ Publicly accessible golf courses
- ▶ Schools with publicly accessible recreation or play areas
- ▶ Environmentally protected areas that are designated for recreation.

No Section 4(f) resources were identified on Airport property (SWCA 2019a). The nearest Section 4(f) resources to RYN are presented on **Figure 1-17** and include the following areas:

- ▶ Pima County's Black Wash Preserve, which allows for non-motorized recreation (approximately 0.25 mile north)
- ▶ Saguaro National Park West (7 miles north)

- ▶ Ironwood Forest National Monument (7 miles northwest)
- ▶ Tucson Mountain Park (3 miles north)

A Recreation and Public Purposes lease agreement was initiated between Pima County and the Bureau of Land Management (BLM) to develop Ryan Park, an approximately 80-acre parcel that would be constructed 600 feet southeast of RYN. The agreement was either not executed or has expired, and the park was not constructed (SWCA 2019a).

An initial review of the planning area did not identify any designated historic sites; however, a survey of cultural and historical resources has not been undertaken at this time. No known Section 4(f) resources are present on the Airport; however, a historic site of national, state, or local significance would be considered a Section 4(f) resource. A historic and cultural resources investigation will be conducted in accordance with Section 106 of the National Historic Preservation Act prior to FAA approval or funding of proposed Master Plan projects.

FARMLAND

The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to cause direct or indirect impacts to important farmland. Direct impacts typically involve the conversion of farmland to non-agricultural use. Indirect impacts affect farming or livestock operations, such as actions that could limit or prevent access to farmable land, or that produce noise at levels that could potentially affect livestock operations or create restrictions on the use of adjacent lands (FAA 2015).

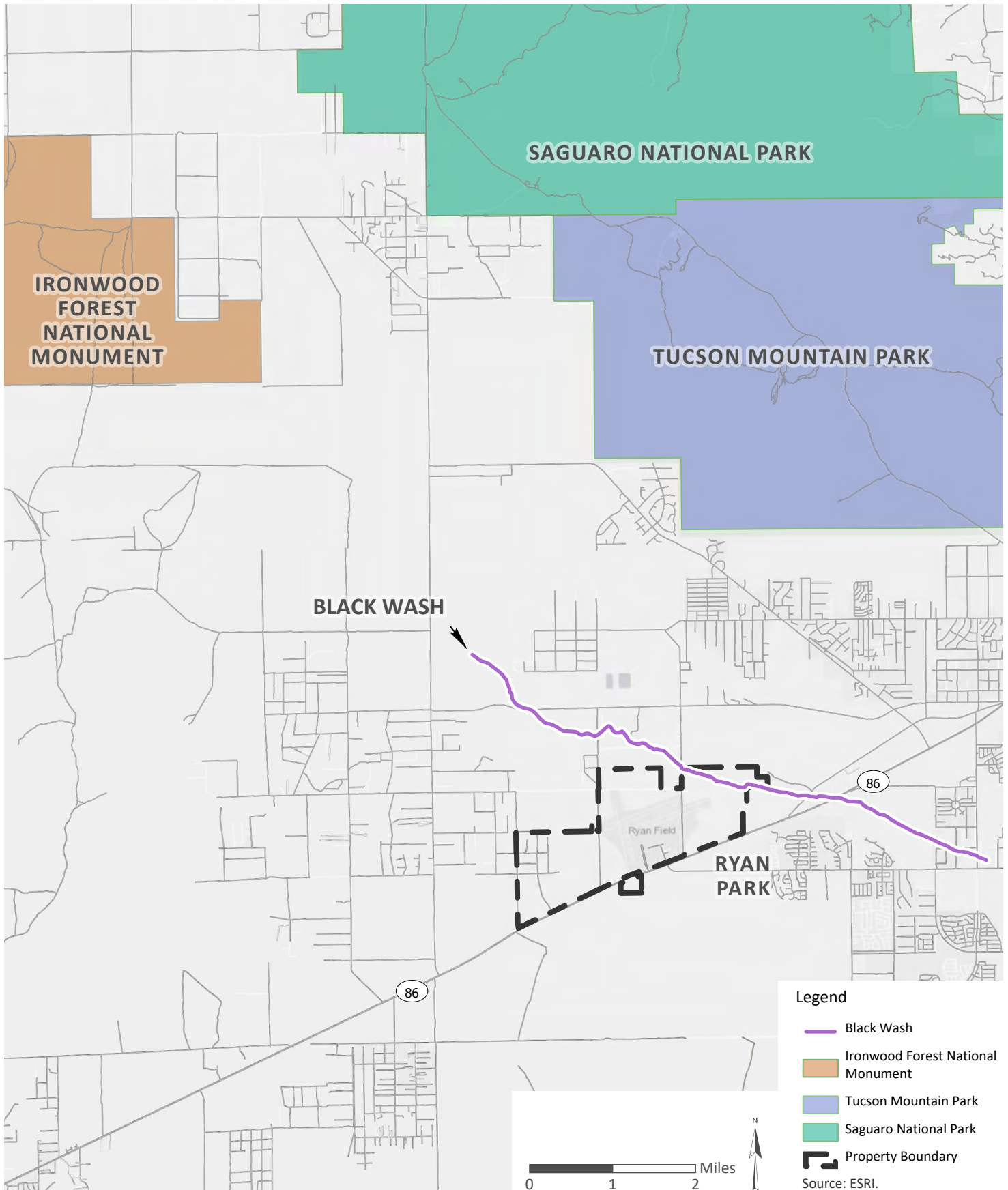
The United States Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) maintains an inventory of prime and unique farmland in the United States. According to the NRCS Soil Map for Pima County, Arizona, the following soil types underlie the Airport as illustrated on **Figure 1-18**:

- ▶ Soil Classification: 8 – Bucklebar-Sahuarita complex with 0 to 3 percent slopes. This soil is not classified as prime farmland.
- ▶ Soil Classification: 34 – Hantz loam with 0 to 1 percent slopes. NRCS classifies this soil as prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season.
- ▶ Soil Classification: 47 – Mahave soils and urban land with 1 to 8 percent slopes. This soil is not classified as prime farmland.
- ▶ Soil Classification: 82 – Tubac sandy loam with 0 to 2 percent slopes. This soil is not classified as prime farmland.
- ▶ Soil Classification: 3 – Anthony fine sandy loam, 0-3 percent slopes. This soil is mostly used for grazing land but is suitable for irrigated farmland but is limited by seasonal flooding and wind erosion.

Although small areas in the western and northeastern portions of the Airport property include soils that could be considered prime farmland (soil classification 34), these areas are not irrigated. None of the Airport property is used for cultivation or grazing. Based on the absence of soils that would be considered prime farmland, no direct or indirect impacts to farmland would result from proposed master plan projects.

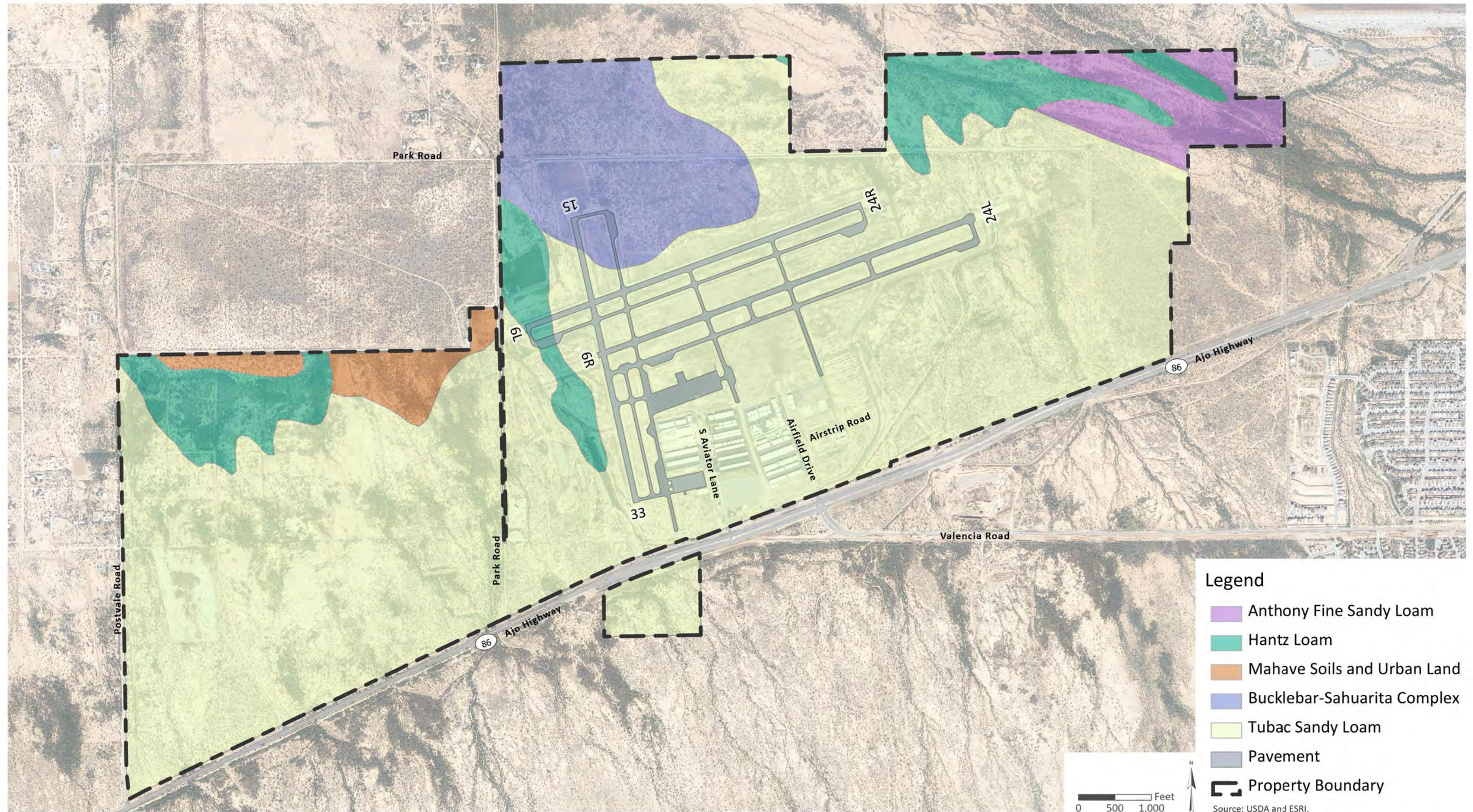
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HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

According to FAA guidance set forth in Order 1050.1F, an evaluation of hazardous materials, solid waste, and pollution prevention must consider:

- ▶ Existing hazardous waste/contamination at a proposed project site and its immediate vicinity; and
- ▶ The local disposal capacity for solid and hazardous wastes that would be generated from a proposed action (FAA, 2015).

Hazardous Materials

The USEPA's NEPAAssist database was consulted to identify hazardous waste sites within a 1-mile radius of RYN (USEPA 2018a), and a Limited Environmental Site Assessment was undertaken to identify the presence of adverse impacts to the soil, groundwater, or surface water resulting from Airport operations or activities on adjacent or nearby properties (SWCA 2019b). **Table 1-11** lists the site names and locations for four hazardous waste sites identified within Airport boundaries. None are listed as a Superfund National Priority List Site.

Table 1-11: Hazardous Waste Sites

Facility/Site Name	Handler ID No.	Location
Air Transport Training International	AZD983483777	6200 S. Aviator Ln. Tucson, AZ 85735
Aircrafters LLC	AZD983473430	6249 S. Aviator Ln. Bld 1 to 3 Tucson, AZ 85735
Aviation Designs of Tucson (Aviones Fumigadores del Sureste)	AZD982466302	6249 South Aviator Lane Tucson, AZ 85735
Orion	AZD983473448	6249 S. Aviator Ln. Bld. 5 Tucson, AZ 85735
Source: US EPA, RCRA Info, 2019		

Aviation Designs of Tucson (Aviones Fumigadores del Sureste), located on-site at 6249 South Aviator Lane is identified as a Superfund Enterprise Management System (SEMS)–Archive site. SEMS-Archive tracks sites that have no further interest under the Federal Superfund Program based on available information. Archived status indicates that the site did not qualify as a Superfund National Priority List Site and was archived in 1992 following a preliminary assessment (ADEQ 2019).

The Aviation Designs site is also listed as a State Hazardous Waste Site, which is the state's equivalent to Superfund. Priority sites planned for cleanup using state funds were identified, along with sites where cleanup would be paid for by potentially responsible parties. The site is not listed as an active site by the Arizona State Department of Environmental Quality's (ADEQ's) Water Quality Assurance Revolving Fund, which supports hazardous substance cleanup efforts in the state; however, the state has not updated the State Hazardous Waste Site database since 2000 (ADEQ 2019).

Underground Storage Tanks

The ADEQ Underground Storage Tank (UST) Database identifies five USTs on Airport property, three of which have been removed. In addition, the ADEQ Leaking Underground Storage Tank Database identified two releases at RYN: one release occurred in 1995 and was closed in 1999, and another was reported and closed in 2012 (ADEQ 2019).

Aviation gas (AV gas) and Jet A fuel are both stored and sold at RYN. Two 12,000-gallon USTs containing AV gas 100 low lead (LL) are owned by TAA and managed by Velocity Air, Inc. Additionally, two 2,000-gallon, above-ground storage tanks contain diesel and unleaded fuel. Jet A is stored in one 5,000-gallon portable refueling tank truck (TAA 2019).

The ADEQ Leaking Underground Storage Tank (LUST) Database was reviewed for Leaking USTs. Two leaking USTs were reported at RYN: one release occurred in 1995 and was closed in 1999 and a second that was reported and closed in 2012 (ADEQ 2019).

Ryan Airfield Landfill

The RYN Landfill was located on Airport property south of the eastern end of Runway 24L and is presented in **Figure 1-3**. The landfill is listed as a closed facility in the solid waste facility/landfill database and is listed in ADEQ's list of closed landfills. Pima County operated the former landfill and is identified as the potentially responsible party (SWCA 2019b). Such landfills typically accepted general municipal (household) waste, but many closed landfills were not manned or gated. Although landfills located near an Army airfield could pose hazardous material concerns, the former RYN Landfill operated from 1973 to 1977, long after the Army departed RYN. Since the area was not used historically for industry or agriculture, the disposal of large quantities of hazardous materials or pesticides is unlikely.

The City of Tucson owns the former landfill property and leases it to TAA. The City monitored the former landfill until 2009 and continues to inspect it annually. No shallow landfill gas probes have been installed at the site. Trends indicated by seven years of soil vapor data and three years of groundwater volatile organic compound data indicated that the probability of groundwater impacts associated with the former landfill was low (SWCA 2019b).

The landfill is not considered to pose concern to the Airport property in general, but development or disturbance within or adjacent to the former landfill footprint may pose concern. Although no specific concerns are identified in association with RYN, further investigation may be required to determine whether hazardous materials are present:

- ▶ The former facility located at 6249 South Aviator Lane may have included a crop-dusting operation (*Aviones Fumigadores del Sureste*) that involved the use of pesticides. Although no specific concerns are identified in federal or state databases, additional documentation will be required to confirm that cleanup efforts were completed leading to the site's archive status (SWCA 2019b).
- ▶ The former RYN Landfill is closed, and although annual inspection is ongoing, monitoring has ceased. Before projects are proposed or constructed near the former Ryan Landfill, the City's monitoring reports and inspection data should be reviewed to identify whether project construction and operation could expose construction workers or site users to hazardous materials during grading, excavation, or other activities (SWCA 2019b).



Solid Waste and Pollution Prevention

Pursuant to FAA Order 1050.1F, project proponents must consider whether nearby solid waste facilities have the capacity to accept project-related construction and demolition debris and waste generated during facility operation. The RYN Transfer Station, which is operated by Tucson Recycling & Waste Services (under contract with Pima County), is approximately 1.5 miles northwest of RYN. The transfer station accepts bagged residential waste, scrap metal, and tires and recycles oil.

The FAA Modernization and Reform Act of 2012 (FMRA) requires an Airport Recycling, Reuse, and Waste Reduction Plan to be prepared as part of the airport master plan. As part of its proposed Master Plan Update, the TAA will develop a Recycling, Reuse, and Waste Reduction Plan in accordance with the FAA Memorandum, “Guidance on Airport Recycling, Reuse, and Waste Reductions Plans,” dated September 30, 2014. The forthcoming plan will be included as an appendix to the Master Plan. Airport facilities will be constructed and operated in accordance with TAA’s forthcoming Airport Recycling, Reuse and Waste Reduction Plan.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Federal law requires project sponsors who request the use of federal funds or approvals to consider how their proposed projects would affect historic properties. In accordance with NEPA and Section 106 of the National Historic Preservation Act, the FAA is the federal lead agency responsible for identifying the potential impacts of a proposed project on these resources and consulting with the federally recognized tribes, the State Historic Preservation Office, and other agencies as necessary.

A comprehensive historic and cultural resources investigation has not been performed for the Airport as a whole; however, an archaeological survey was conducted in 2016 in support of airfield drainage improvements. The survey included 126 acres in the southeastern portion of the Airport (SWCA, 2017b). The survey also included a review of the National Register of Historic Places (NRHP) listed and eligible properties, but no NRHP-listed properties were identified within 1 mile of the drainage improvement project site. Two new archaeological sites and ten isolated occurrences were identified during the field investigation. Both archaeological sites were associated with earlier airfield facilities, and neither site was determined to be eligible for the NRHP (SWCA 2017b).

Sufficient information is not available to identify the presence and extent of historical and cultural resources throughout the Airport. Additional studies will be required prior to FAA project approvals or funding to comply with NEPA, the National Historic Preservation Act, and associated laws and orders.

LAND USE

The areas north, east, and west of the Airport are sparsely developed, but some low-intensity rural development is present. The undeveloped area immediately north of the Airport and east of South Continental Road is identified as the Millstone Industrial District, and an undeveloped area northeast of the intersection of West Nebraska Street and South Continental Road is designated as the Grant Industrial Sites. An industrial site is adjacent to South Braniff Road

less than 1 mile north of the airfield. A sanitary sewer treatment facility is located 1 mile due north of the Airport. The area southeast of the Airport is characterized by single-family residential development. The nearest residential development is located approximately 1 mile southeast of the Airport between West Valencia Road and W. Ajo Highway.

Pima County Comprehensive Plan

As shown on **Figure 1-19**, the Pima County Comprehensive Plan designates most of the Airport property for Industrial (I) use, as well as adjacent property northwest of the intersection of Ginter and South Continental Road, the area east of the intersection of W. Ajo Highway and W. Valencia Road, the area immediately east of the Airport, and an adjacent parcel south of Runway 33. Allowable zoning districts include local and general business zones, campus park industrial zones, light industrial/warehouse zones, general industrial zones, and specific plan areas (Pima County 2015).

The northernmost portion of the Airport property and a portion of the property northeast of the intersections of W. Ajo Highway and South Postvale Road are designated for Low Intensity Rural (LIR) use. Residential development is allowed in these areas at a maximum intensity of 0.3 dwelling units/acre. Property west of the Airport and most property north of the Airport share this designation.















The area south of the W. Ajo Highway and West Valencia Road is designated for Planned Development Community (PDC) use, which enables development identified in approved specific plans. Single-family residential communities located adjacent to West Valencia Road and within 1 mile of the Airport's southern/southeastern boundaries include the Sonora Ranch Estates.

The Pima County Comprehensive Plan identifies RYN as an economic resource and center for job creation, and the plan includes economic and rezoning policies in support of aircraft operations and that prevent incompatible land uses. The Comprehensive Plan also includes policies associated with environmental open space, environmental conservation, water resources, energy conservation, etc., that will apply to proposed airport development. Proposed master plan projects will be reviewed to determine applicable land use policies set forth in the comprehensive plan.


Applicable General Plan Policies

Several portions of the Comprehensive Plan identify policies that are specific to RYN and its environs. Policies associated with specific environmental resources are discussed in other sections of the environmental overview.

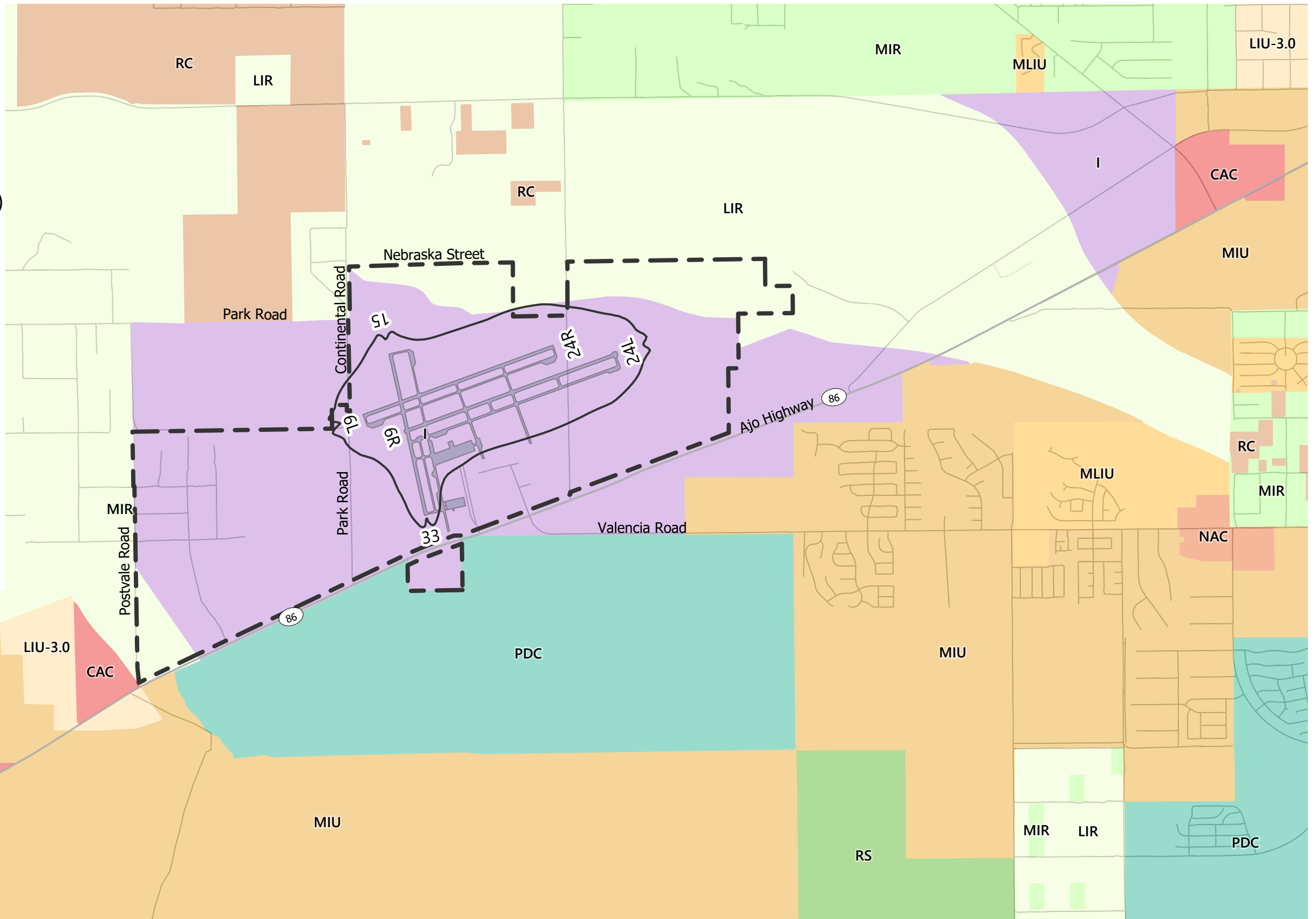
Legend

-  Existing 65 DNL Noise Contours
-  Industrial (I)
-  Community Activity Center (CAC)
-  Neighborhood Activity Center (NAC)
-  Medium Intensity Urban (MIU)
-  Medium Low Intensity Urban (MLIU)
-  Low Intensity Urban-3.0 (LIU-3.0)
-  Medium Intensity Rural (MIR)
-  Low Intensity Rural (LIR)
-  Planned Development Community (PDC)
-  Resource Conservation (RC)
-  Resource Sensitive (RS)
-  Pavement
-  Property Boundary

Source: RYN ALP 2011, Pima County, ESRI, and Census.



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Economic Element

The Comprehensive Plan's Economic Development Element identifies RYN as a potential center for job creation following the development of additional infrastructure. **Table 1-12** identifies the goals and policies in the General Plan that are specific to RYN.

Table 1-12: Economic Element Goals and Policies Applicable to Ryan Airfield

Goal	Description
Goal 5	Align transportation, land use, infrastructure, and economic development goals to support TUS as a logistics center and RYN as a job creator.
Policy 5	Work with TAA, Arizona DOT, and others to provide the infrastructure needed to best position RYN as a sub-regional employer.
Policy 6	Recognize the importance and value of the entire length of Valencia Road as an Economic Development Corridor from RYN to Saguaro National Park East.
Implementation Measures	<ul style="list-style-type: none"> • Work collaboratively with the TAA in the development of a second runway and the implementation of its master plan. • Work to bring the Sonoran Corridor to fruition. • Promote efforts to position RYN as a logistics hub.

Source: Pima County, 2015.

Rezoning Policies: Ryan Airfield-Area Mixed Use Employment Center

Rezoning Policies are overlay policies that apply to discrete areas composed of one or more parcels. These parcels are included in an adopted specific plan but have not been completely developed. RYN is included in Rezoning Policy Area 112 (RP-112), RYN-area Mixed Use Employment Center (SW). Policies associated with this area promote land use compatibility with aircraft operations. Additional policies identify the necessary requirements and coordination with the Regional Flood Control District that must be undertaken during project planning activities.

Airport Zoning

RYN is zoned as an Airport, and Pima County ordinances recognize the need for compatibility with the surrounding area and provide land for appropriate civic, utility, office, resource, commercial and industrial uses. Pima County has jurisdiction for land use planning, zoning, and regulations and is required by ordinances of Arizona Law Title 28, Chapter 25, Article 7 to enforce regulations and restrictions to protect the Airport from incompatible land uses.

Airport operators who receive federal funds must agree to certain obligations (or assurances). Grant Assurance No. 21, Compatible Land Uses, requires airport operators to "take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the Airport to activities and purposes compatible with normal Airport operations, including landing and takeoff of aircraft" (FAA 2014).

NATURAL RESOURCES AND ENERGY SUPPLY

Proposed projects have the potential to increase the amount of energy required to operate the Airport, including fuel and power consumption. CEQ regulations require federal agencies to consider the energy requirements and natural resource requirements associated with proposed projects (FAA 2015). To do so, project sponsors must identify:

- ▶ The suppliers of energy resources found in the area, such as power plants, water utilities, sewage disposal utilities, and suppliers of natural gas and petroleum; and
- ▶ The amount of other resources, such as water, asphalt, aggregate, and wood, a project would use in the construction, operation, and maintenance of a project and where the suppliers are located (FAA, 2015).

To address the surface water and drainage issues found at the Airport, the TAA prepared these studies in support of the proposed drainage improvements:

- ▶ **Ryan Airfield Airport-Wide Basin Study Update** – In 2006, the Ryan Airfield Airport-Wide Basin Study addressed future developments associated with the storm-water runoff on and across the Airport. According to the study, areas of the Airport property had been adversely affected by runoff from upstream watersheds causing erosion of airfield pavement and damaging airfield instrumentation on the east side. To address drainage issues identified on the southeast side of the Airport property, improvements to the drainage system (i.e. levee and culvert system) were recommended to protect the Airport from upstream runoff.
- ▶ **Conditional Letter of Map Revision (CLOMR) Feasibility Study** – In 2009, the feasibility study concluded that the existing earthen levee did not have the freeboard required by FEMA standards and was not certified. An uncertified levee is assumed to fail by FEMA; therefore, the 100-year floodplain would extend within airfield operation areas. The CLOMR proposed a future levee and low-flow channel design and was conditionally approved by FEMA on February 8, 2011. TAA, however, has not proceeded with a formal CLOMR process based on this concept.
- ▶ **Geotechnical Engineering Report** – In 2010, a geotechnical investigation was conducted to determine what improvements would be necessary to construct a new earthen levee farther east of the existing levee.
- ▶ **Preliminary Jurisdictional Determination** – In 2011, a Preliminary Jurisdictional Determination identified two braided washes within the southeast portion of the Airport property and Environmental Assessment study area as Potential Waters of the U.S. Note that since the 2011 analysis, TAA has re-assessed the current Preliminary Jurisdictional Determination with the intent to eliminate the braided washes from the property.
- ▶ **Ryan Airfield Drainage Improvements Project Environmental Determination** – Due to the FAA being identified as a possible funding source for the recommended drainage improvements in the preceding analyses, the TAA prepared an Environmental Assessment in accordance with National Environmental Policy Act (NEPA) requirements. The assessment type was changed to a Categorical Exclusion later in the project.
- ▶ **Ryan Airfield Drainage Improvements Feasibility Report** – In 2017, in support of an Environmental Assessment, Ryan Airfield completed a Drainage Improvements Feasibility Report. The feasibility report included an updated hydraulic analysis using FLO-2D modeling.

NOISE AND NOISE-COMPATIBLE LAND USE

The 2010 Master Plan for RYN addressed a 20-year planning horizon that spanned from 2008 to 2027. To support master plan preparation, TAA developed aviation forecasts, and the associated projections for noise that would be generated by the forecasted operations. The noise projections were presented on a noise exposure map to reflect the geographic area exposed to aircraft noise throughout the 20-year period. The forecasts indicate that the Airport would support a total of 253,500 operations by 2027. The number of total operations recorded in 2018 was 94,881.

FAA guidance considers excessive aircraft noise exposure to be exposure at or above 65 A-weighted decibels (dB) measured using the day-night average noise level (DNL) metric. The DNL metric represents the average sound level, in decibels, for the 24-hour period from midnight to midnight as weighted to reflect additional annoyance for sounds generated between midnight and 7 a.m. and between 10 p.m. and midnight local time.

Figure 1-19 identifies the location of the 65 dB DNL noise exposure contour using the number of forecasted operations for 2027 as identified in the 2010 master plan. As shown, the noise exposure at 65 dB or higher remains almost entirely within the Airport property boundaries, with the exception of a small area just west of Runway 6L, which is designated for industrial use and would not be considered incompatible with aircraft operations. Since the total number of aircraft operations currently supported by RYN is less than 40 percent of the forecasted aircraft operations used to create the noise contour shown, it is unlikely that this parcel is subject to aircraft noise exposure exceeding 65 dB DNL.

SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomics

The potential effects of proposed Airport projects can extend to nearby neighborhoods and communities to cause direct or indirect socioeconomic impacts. The principal social impacts that should be considered are those associated with relocation or other community disruption, transportation, planned development, and employment. Project implementation may also affect employment by creating temporary or permanent jobs associated with Airport development or by relocating jobs.

Children's Environmental Health and Safety Risks

NEPA requires project sponsors and federal agencies to consider environmental health risks and safety risks that may disproportionately affect children. Children's health and safety risks are generally those risks that would be attributable to products or substances children are likely to encounter or ingest through air, food, drinking water, recreational waters, soil, or other projects that children might use or to which they might be exposed.

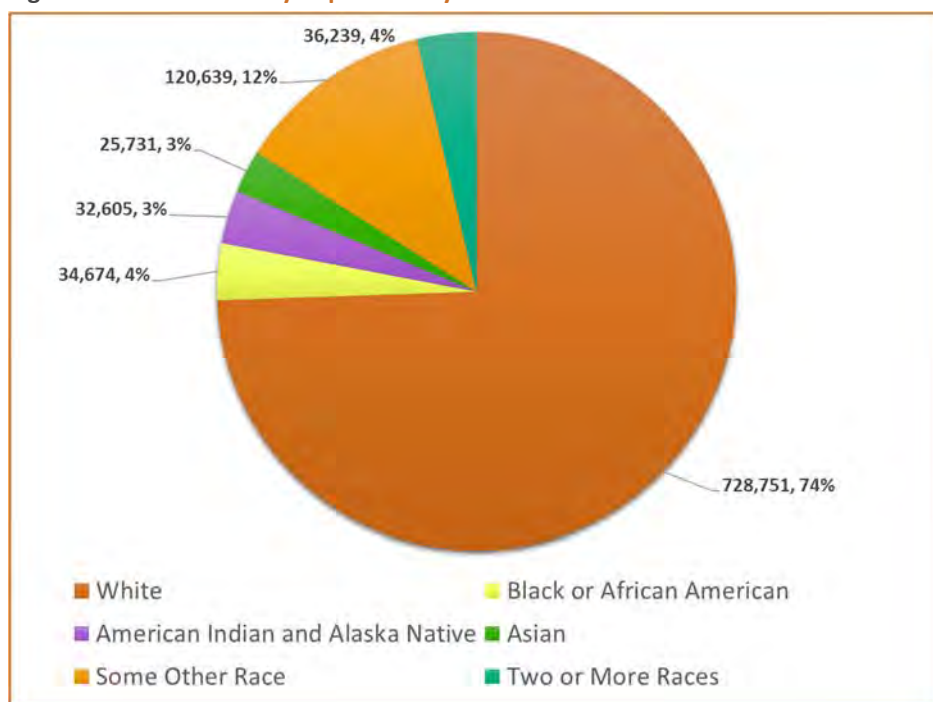
The nearest school to RYN is Banks Elementary School, which is 3 miles northeast of the Airport on Lead Flower Avenue. The nearest recreational area is the Star Valley Community Park, which is 3.5 miles southeast of the airport on Brightwater Way. The nearest residence is located 0.3 mile from RYN, and a suburban subdivision is located approximately 1 mile southeast of the Airport.

As previously discussed, a future recreational site identified as Ryan Park was proposed for construction on BLM property approximately 600 feet southeast of RYN. A Recreation and Public Purposes lease agreement was initiated between Pima County and the BLM to develop Ryan Park, but the agreement was either never executed or has expired (SWCA 2019a).

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences. Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health. Pursuant to NEPA, project sponsors must consider whether a proposed action could cause disproportionately high and adverse effects on low-income or minority populations.

Data from the 2010 U.S. Census identified the population of Pima County at 980,263 inhabitants in 388,660 households. As shown in **Figure 1-20**, approximately 73 percent of the county is identified as white.

Figure 1-20: Pima County Population by Race

Source: US Census Data, 2010

Data from the 2010 U.S. Census, using 2017 inflation-adjusted dollars, indicate that approximately 18.3 percent of individuals in Pima County are living below the poverty level, compared to 12.3 percent of individuals for the nation as a whole. Household Income/benefit data are summarized in **Table 1-13**.

Table 1-13: Household Income and Benefits for Pima County, Arizona

Income Range	Number of Households	Percentage
Less than \$10,000	31,335	7.9%
\$10,000 to \$14,999	22,659	5.7%
\$15,000 to \$24,999	47,863	12.0%
\$25,000 to \$34,999	44,185	11.1%
\$35,000 to \$49,999	57,669	14.5%
\$50,000 to \$74,999	71,995	18.1%
\$75,000 to \$99,999	46,403	11.6%
\$100,000 to \$149,999	44,959	11.3%
\$150,000 to \$199,999	16,425	4.1%
\$200,000 or more	15,037	3.8%
Median household income (dollars)	48,676	
Mean household income (dollars)	67,524	
Total households	398,530	

Visual Effects (Light Emissions / Visual Resources)

Visual effects refer to the extent to which a project would emit light that creates annoyance or interferes with other activities, contrasts with or detracts from visual resources, or affects the visual character of the existing environment.

Light Emissions

Light emissions include any light that originates from a light source into the surrounding environment. Airport light emissions include airfield and apron floodlights and NAVAIDs. The nearest sensitive receptors are residents located approximately 0.3 mile ($\pm 1,500$ feet) northwest of the Runway 15 threshold. The nearest residential subdivision is located southeast of RYN between Ajo Highway and West Valencia Road. The nearest residence is located approximately 1 mile from the Runway 24L threshold, which is the nearest point within the AIA.

Visual Resources and Character

Visual resources include structures, buildings, cultural properties, and other natural or constructed landscape features that are visually important or have unique characteristics. The areas of RYN that are not developed retain the same dry scrubland appearance as the adjacent land uses and match the local terrain. The Tucson Mountains, which are 7 miles northeast, are visible from the airfield.

Water Resources

Water resources include jurisdictional wetlands, floodplains, surface water, groundwater resources, and designated wild and scenic rivers.

Wetlands

Executive Order 11990 directs federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Wetlands are protected under Section 404 of the Clean Water Act, which requires a project applicant to obtain a permit from the U.S. Army Corp of Engineers or the authorized state for the discharge of dredged or fill material into waters of the United States (waters of the U.S.).

The U.S. Fish and Wildlife Service National Wetlands Inventory, USEPA data, and Pima County data were reviewed to identify potentially jurisdictional wetlands. No wetlands were identified on or adjacent to RYN using these resources; however, the Black Wash, which intersects the northeast portion of the Airport property, and several and other washes within the planning area have the potential to be jurisdictional waters. Riparian habitat is also present. **Figure 1-21** presents surface water resources and floodplains on and adjacent to the airport.

Floodplains

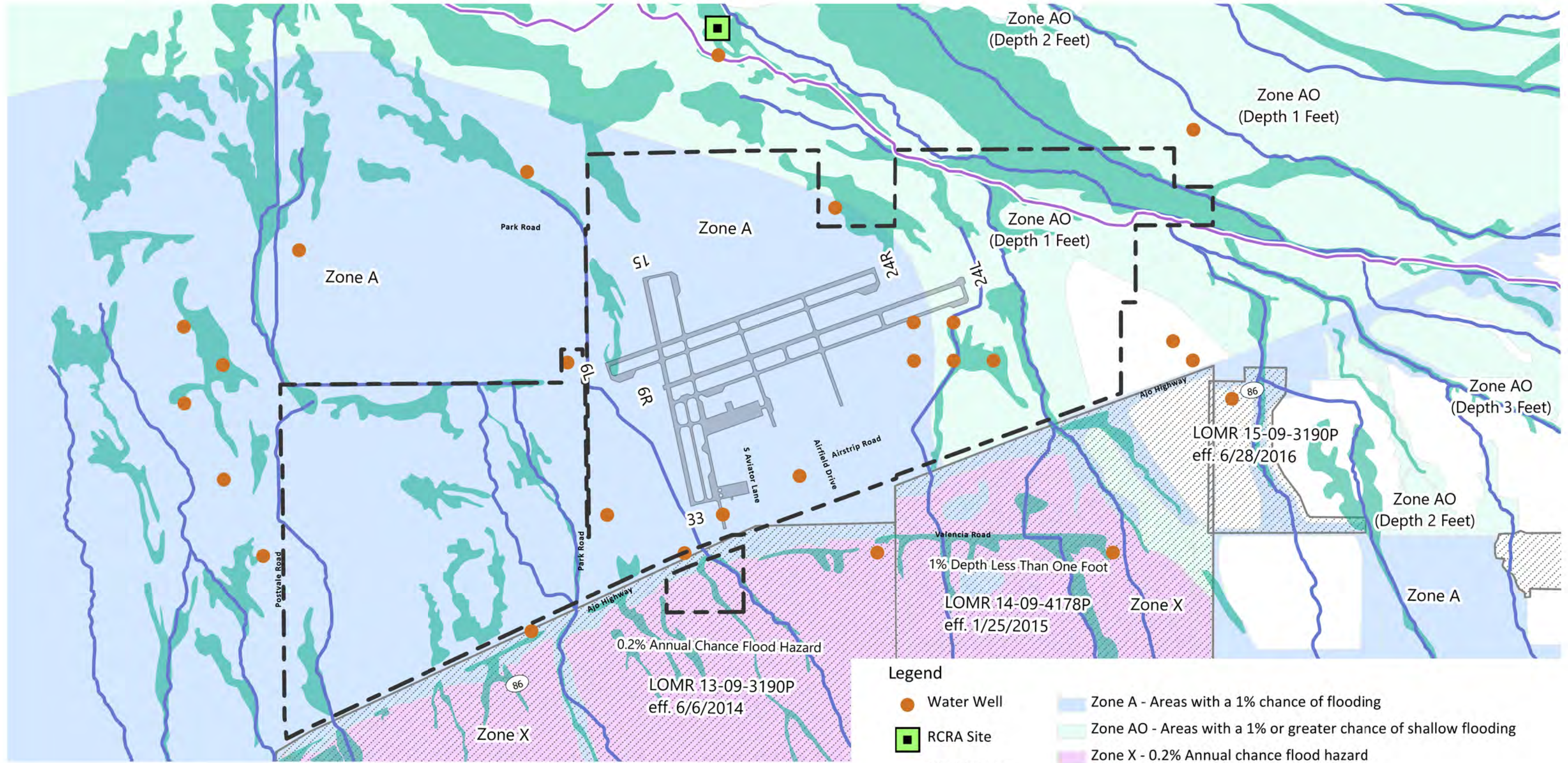
Executive Order 11988 requires federal agencies “to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains (i.e., areas subject to inundation by a 1 percent annual chance of flood) and to avoid direct or indirect support of floodplain development whenever there is a practical alternative” (FAA 2015). The Federal Emergency Management Agency (FEMA) prepares Flood Insurance Rate Maps (FIRMettes) to identify flood risk. Any proposed project in a FEMA-mapped floodplain must comply with the FAA regulations regarding construction within a floodplain and the community’s FEMA-approved floodplain management plan, if such a plan exists.

Data obtained from FEMA and Pima County indicate that RYN is located in designated floodplains. As shown on **Figure 1-21**, the western portion of the airport north of Ajo Highway is located in Zone A, the area with a 1 percent

annual chance of flood. The eastern portion of the airport is designated as Zone AO, which also has a 1 percent annual chance of flood and subject to shallow flooding or ponding (to a depth of 1 foot). The approximately 30-acre parcel south of Ajo highway and the adjacent areas are located in an area with a 0.2 percent annual chance of flood.

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Source: ESRI, USGS The National Map, October 2020
 LOMR and FEMA Firm Data: Pima County Geospatial Data Portal, March 25, 2021
 LOMR Data Cont.: FEMA's National Flood Hazard Layer Viewer
 LOMR Information: 13-09-3190P eff. 6/6/2014, 14-09-4178P eff. 1/25/2015, 15-09-3190P eff. 6/28/2016

- Legend**
- Water Well
 - RCRA Site
 - Black Wash
 - Ephemeral Wash
 - Riparian Habitat
 - Zone A - Areas with a 1% chance of flooding
 - Zone AO - Areas with a 1% or greater chance of shallow flooding
 - Zone X - 0.2% Annual chance flood hazard
 - Property Boundary
 - Pavement
 - Letter of Map Revision (LOMR)

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RYN and adjacent properties also include areas designated by Pima County as Class C, Class H, and Class IRA-H regulated riparian habitat (see **Figure 1-21**). The riparian areas generally follow the ephemeral channels that cross the Airport from the south to northwest and into the Black Wash in the northeastern portion of RYN. Floodplains and designated riparian areas are subject to the County's Floodplain Management Ordinance, which is set forth in Title 16 of the Pima County Code.

Pima County's Comprehensive Plan includes several policies in its Land Use and Open Space chapter that address proposed development within floodplains and regulated riparian habitat. In addition, RYN is included in the County's Avra Valley Special Area (S-9), which includes specific policies for the Black Wash. Special Area Policy E states, "All development affecting Black Wash, including public works, shall be required to preserve and restore riparian habitat, and provide opportunities for view enhancement and interpretive signage." A scenic pull-off to include an interpretation of the riparian area and a view orientation to the visible mountain ranges is encouraged.

RYN is almost entirely located within the 100-year floodplain and contains areas of regulated riparian habitat. A Pima County Development Services Activity Permit and Pima County Flood Plain Use permit would be required for future airport improvements projects. Development within the floodplain could also require preparation and filing of a Letter of Map Revision (LOMR). Proposed Airport improvement projects would also be subject to County Floodplain Management Ordinance, which is set forth at Title 16 of the Pima County Code, and applicable Comprehensive Plan policies.

Surface Water

Surface water is water that occurs above ground such as a wetland, river, stream, or lake. RYN is located within the Brawley Wash Watershed. Stormwater discharge from seasonal precipitation enters the Airport from the south through several culverts under Ajo Highway. Surface water flows generally follow a system of ephemeral channels northwest across RYN where it enters the Black Wash in the northern portion of the airport. The Black Wash then flows north and discharges to the Brawley Wash, approximately 4 miles north of RYN, before eventually discharging into the Santa Cruz River (SWCA 2019c). No impaired surface waters were identified within or adjacent to RYN (SWCA 2019c). A detailed study of floodplains has not been identified for the system of ephemeral channels. **Figure 1-21** presents the location of surface water resources

Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. Aquifers are the geologic layers that store or transmit groundwater to wells, springs, and other water sources. The Safe Drinking Water Act and its implementing regulations (40 Code of Federal Regulations [CFR] parts 141-149) prohibit federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area (FAA 2015). State and local agencies may also promulgate regulations to protect sole source aquifers and their recharge areas.

Thirty groundwater wells were identified on or within 0.5 mile of RYN with depths ranging from 170 to 1,000 feet below ground surface (see **Figure 1-21**). The water supply for RYN is provided by existing Tucson Water transmission mains, which provide drinking water, and on-site or nearby wells. The nearest downgradient drinking water well identified on available maps is more than 1 mile from the Airport (SWCA 2019b); proposed Airport projects would not be expected to affect drinking resources.

Wild and Scenic Rivers

Wild and scenic rivers are rivers that have remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values as defined by the Wild and Scenic Rivers Act. If the FAA or another federal agency proposes or authorizes an action that would affect resources covered by the Wild and Scenic Rivers Act, consultation with the appropriate federal agency would be required.

The National Wild and Scenic Rivers Map identifies the presence of any designated wild or scenic river on the Airport or its vicinity. The nearest designated wild and scenic river is a segment of the Verde River located more than 140 miles north of the Airport (National System 2019). The Airport is not hydrologically connected to this river.

INVENTORY SUMMARY

Ryan Airfield serves a wide variety of GA and corporate users and continues to provide a link to the National Airspace System. RYN and the FAA continue to invest in aviation facilities to support current and future use. Recent pavement maintenance projects have improved surfaces for Runway 6L/24R, Taxiway A, Taxiway C and Taxiway D. Improvements were also made to the Airport perimeter fencing and access roads. The backup airfield lighting generator system was also updated with new equipment. The key airport attributes identified in this chapter to be considered further as part of the airport master plan facility requirements and improvement alternatives include:

Airfield

- ▶ Airfield pavement conditions to support existing and future aircraft
- ▶ Taxiway Hotspots require further evaluation of the system geometry and design to mitigate or remove the causal factors for runway incursions.
- ▶ Runway length to support existing and future aircraft
- ▶ Runway lighting and instrument approach lighting systems
- ▶ Instrument approach improvements to reduce minimums and improve Airport utility during inclement weather

Terminal Area

- ▶ Airport terminal building and Airport administration office improvements
- ▶ Fuel storage and delivery systems condition, location, and capacity
- ▶ Hangar facility development with areas to be in-filled and future hangar sites
- ▶ Flight school and FBO business development
- ▶ TAA operations and maintenance equipment and storage facilities

Landside Property

- ▶ Potential development and re-development areas
- ▶ Extension of utilities to serve terminal and landside areas
- ▶ Roadway improvements to Airport development areas
- ▶ Future property acquisition and aviation easements needs
- ▶ Future disposition of on-Airport non-aeronautical property areas

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