



CHAPTER 8
AIRPORT PLANS
MASTER PLAN UPDATE

Nogales International Airport
Santa Cruz County

April 2002

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Chapter 8 – Airport Plans

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CHAPTER 8 AIRPORT PLANS

8.1 INTRODUCTION

A set of airport layout plans is prepared to graphically depict the proposed improvements for the Nogales International Airport. These drawings, commonly referred to as the Airport Layout Plan (ALP) set, provide the physical details of the long-term development plan. Chapter 9, Implementation, identifies the phasing of this development. Projects eligible to receive federal funding under the Airport Improvement Program (AIP) must be shown on an approved Airport Layout Plan in order to qualify for assistance.

The primary drawing of the Plan set is the Airport Layout Plan (ALP) sheet, which is the overall development plan for the airport, showing both existing and proposed facilities. Other drawings in the set show existing and future airport conditions in terms of airspace, land use, and property ownership.

The ALP set is an important tool for airport development. All ALP set drawings should be reviewed and revised, as appropriate, upon completion of airport improvement projects. Each ALP set submitted for FAA review should include a completed ALP checklist. A reduced version of the ALP set is included at the end of this chapter. Drawings developed in the ALP set for Nogales International Airport include the following:

- Title Sheet and Index
- Airport Layout Plan
- Terminal Area Plan
- Airspace Plan/Part 77
- Approach Plan and Profiles
- On-Airport Land Use Plan
- Off-Airport Land Use Plan /Noise Contour Map
- Airport Property Map

A brief description of the purpose of each drawing follows.

8.2 TITLE SHEET AND INDEX

The Title Sheet and Index serve as an introduction to the ALP set of drawings. This sheet outlines the title and exhibit number of each drawing within the set and identifies the grant numbers associated with federal and state funding.

8.3 AIRPORT LAYOUT PLAN

The Nogales International Airport Layout Plan reflects all projects recommended in the Master Plan Update through the year 2020. In addition, development beyond demand is included for long-term planning and contingency purposes. Some of the key projects for Nogales International include Runway 3-21 widening, relocation of the displaced threshold, land acquisition, perimeter roadway construction, additional hangar development, and cargo apron expansion.

The ALP is incomplete without several other required pieces of information related to the drawings. The Airport Data Table, Runway Data Table, All-Weather Wind Rose, and the Legend are all included on the ALP. Much of this data is illustrated directly on the drawing. This information is given for the existing and future conditions. Data and development issues requiring additional detail are addressed in the general notes.

The Airport Data Table includes information related to the airport overall such as airport elevation, airport reference point (ARP) coordinates, mean maximum daily temperature, and airport reference code. The airport reference code (ARC) is defined in FAA AC 150/5300-13, Airport Design, as a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to use the airport. The designation "C-II" indicates that aircraft using Nogales International Airport are in Approach Category C, and Airplane Design Group II. Approach Category relates to aircraft approach speed, and Design Group relates to aircraft wingspan.

The Runway Data Table presents the information for each runway such as runway end elevations, approach category, aircraft design group, runway dimensions, runway surface and pavement strength, runway instrumentation, runway lighting and marking, approach aids, and runway safety area dimensions. As shown, the runway dimensions cross-reference a "Declared Distances" table. This table includes four specific runway lengths in accordance with Appendix 14, FAA AC 150/5300-13, Change 6. These runway lengths vary based on the location of the displaced threshold and the limitations associated with the non-standard runway safety area. The Declared Distances Table provides take-off runway available, take-off distance available, accelerate-stop distance available, and landing distance available for both Runway 3 and 21.

The all-weather wind rose, also shown on the ALP sheet, covers wind conditions under all weather conditions. The all-weather wind rose indicates by compass sector the frequencies at which winds in a given velocity range occur. Runway orientation is superimposed on the wind rose and the percentage of wind coverage for the all-weather condition is provided. For Nogales, crosswind coverage is in excess of 99 percent.

A vicinity map and location map are also shown on the ALP sheet. The location map shows the general geographic location of the City and the Airport relative to other cities and towns in the State of Arizona. The vicinity map shows the location of the airport in relation to the City of Nogales.

8.4 TERMINAL AREA PLAN

The Terminal Area Plan represents a large-scale plan view of facilities such as the terminal building, aircraft apron, and parking. Existing and future buildings are located behind the

building restriction line (BRL). The BRL allows building heights up to 28 feet on the west side and 34 feet on the east side.

This plan serves to provide additional detail on the terminal area beyond that included on the ALP sheet.

8.5 AIRSPACE PLAN

Ideally, airports should be located so that the surrounding airspace is free and clear of obstructions that could be hazardous to aircraft. It is necessary to keep the surrounding airspace free from obstacles by preventing, where possible, the development and growth of obstructions that could interfere with the navigation of aircraft.

The regulations for the protection of airspace in the vicinity of airports are established by the definition of a set of "imaginary surfaces" penetration of which is an obstruction affecting navigable airspace. The geometry of these imaginary surfaces is governed by the regulations set forth in Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace.

The Airspace Plan depicts the airspace for Nogales International Airport, showing imaginary surfaces described in FAR Part 77. It is important to illustrate the airspace for the ultimate airport development condition in order to prevent introduction of obstructions that would inhibit realization of the plan. However, numerous terrain penetrations exist. These penetrations are shaded on the airspace drawing (P4) and summarized in an obstruction table. As shown, terrain penetrations reach 262 feet.

The principal imaginary surfaces shown in the airspace plan are:

- Primary Surface
- Approach Surface
- Horizontal Surface
- Transitional Surface
- Conical Surface

8.5.1 Primary Surface

The primary surface is a surface longitudinally centered on a runway. When the runway has a prepared hard surface, the primary surface extends 200 feet beyond each end of the runway. Existing and future Runway 3-21 is a runway with a non-precision approach and a primary surface width of 500 feet.

8.5.2 Approach Surface

The approach surface is a surface longitudinally centered on the extended runway centerline, which extends outward and upward from each end of the primary surface. Approach slope and dimensions are determined for each runway end based on the type of approach.

Runway 3-21, is categorized as a non-precision runway and requires a 34:1 approach slope out a horizontal length of 10,000 feet. The approach surface measures 500 feet at the inner edge, where it matches the primary surface for this runway.

8.5.3 Horizontal Surface

The horizontal surface is a horizontal plane 150 feet above the established airport elevation. Nogales International Airport is at an elevation of 3,952 feet MSL so the horizontal surface is at an elevation of 4,102 feet. The plan dimensions of the horizontal surface are set forth by arcs of specified dimensions from the end of the primary surface. A tangent line connects the arcs. These arcs correspond with the approach surface length described earlier.

8.5.4 Transitional Surface

The transitional surface is an inclined plane with a slope of 7:1 extending upward and outward from the primary and approach surfaces, terminating at the point where they intersect with the horizontal surface or any other surface where more critical restrictions are intercepted. This surface is used in part for establishing the building restriction line at the airport.

8.5.5 Conical Surface

The conical surface is an inclined plane extending upward and outward from the outer boundary of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet. The top of the conical surface is at a height of 350 feet above the airport elevation, which is 4,302 feet MSL for Nogales International.

8.6 APPROACH PLAN AND PROFILES

The Approach Plan and Profiles Drawing provides a detailed look at the physical features near each runway's extended centerline including topography, roads, obstructions and incompatible objects in these critical areas. For Nogales, the primary concern is the significant terrain in the approach to Runway 21, which is the driving factor behind this runway's displaced threshold.

Based on the FAA's recent approval, the displaced threshold on Runway will be relocated. Both the existing and future displaced thresholds and their associated approach slopes are reflected on the profile view.

8.7 ON-AIRPORT LAND USE PLAN

The On-Airport Land Use Plan prepared for Nogales reflects recommended land uses in support of the preferred development plan. Land uses, as described previously in Chapter 7, include airfield operations area; general aviation (GA); cargo; U.S. Customs/ Border Patrol; terminal area; FBO/Flight School; and aviation-compatible industrial park.

8.8 OFF-AIRPORT LAND USE PLAN AND NOISE CONTOUR MAP

The Off-Airport Land Use Plan/Noise Contour Maps illustrate the boundaries of the airport property, designated off-airport land use as designated by the controlling jurisdiction, and noise contours. The County-adopted Airport District Overlay Zone (ADOZ) is also reflected. Chapter 7, Land Use Analysis, presents the details of the noise analysis and resulting 1999 and 2020 drawings, and the background on the ADOZ.

8.9 AIRPORT PROPERTY MAP

The Airport Property Map is the last drawing of the ALP set. This drawing is provided to show details on how the various parcels of land within the boundaries of the airport were acquired. All of the documents recording the land acquisitions are described in a table as well as the type of instrument used to acquire the property. The Property Map also reflects future acquisitions, easements, and/ or use agreements. For Nogales, three parcels of land are proposed for acquisition in fee simple and one parcel of land is proposed for an aviation easement acquisition during the planning period. In addition, a portion of airport property is identified for conveyance so a proposed access road may be developed off-airport on an adjacent property. This conveyance and roadway development will allow the termination of the existing roadway easement which runs through the Runway 3 RPZ. The roadway easement provides the adjacent private property owner access to their property.

NOGALES INTERNATIONAL AIRPORT

NOGALES, ARIZONA

AIRPORT MASTER PLAN UPDATE
 AIRPORT LAYOUT PLANS
 AIP NUMBER: 03-04-0009-03
 ADOT GRANT NO. EO129

SHEET INDEX

NO.	DESCRIPTION
P1	COVER SHEET
P2	AIRPORT LAYOUT PLAN
P3	TERMINAL AREA PLAN
P4	PART 77 AIRSPACE PLAN
P5	RUNWAY 3 APPROACH PLAN AND PROFILE
P6	RUNWAY 21 APPROACH PLAN AND PROFILE
P7	OFF - AIRPORT LAND USE/ 1998 NOISE MAP
P8	OFF - AIRPORT LAND USE/ 2020 NOISE MAP
P9	ON - AIRPORT LAND USE PLAN
P10	AIRPORT PROPERTY MAP



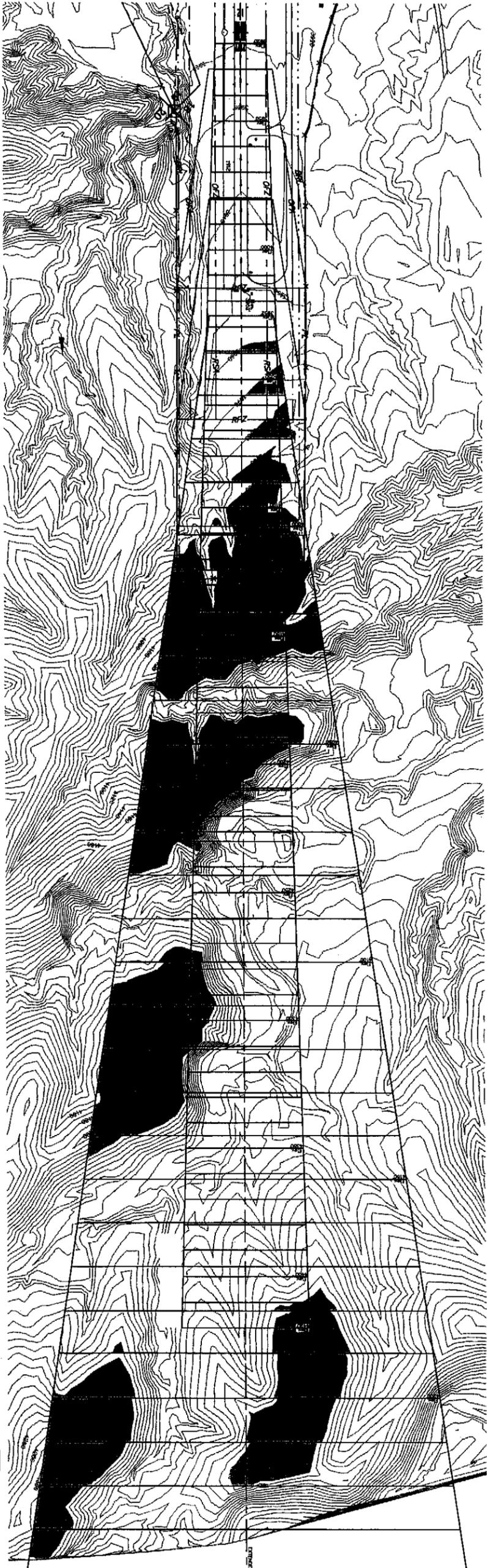
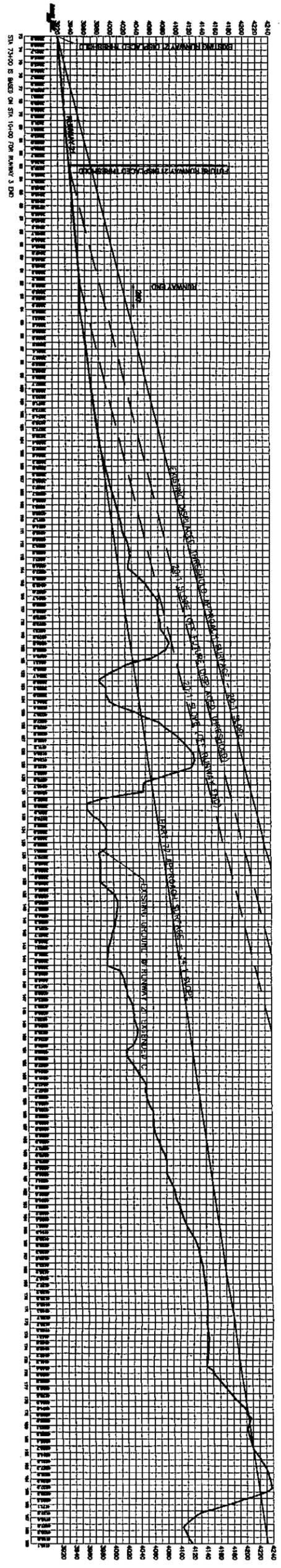
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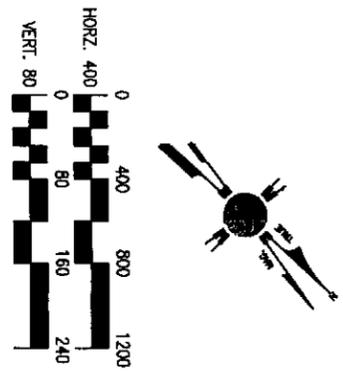
Rev.	Description	By	Date
1	Master Plan and AIP Update	LI	03/02
2	Revision	LI	03/02
3	File Name: 1-10g-Covering	LI	12/01
4		LI	12/01

COVER SHEET
 NOGALES INTERNATIONAL AIRPORT
 NOGALES, ARIZONA

Project No.	81451310
Drawing No.	P1
Sheet	1 of 10
Revision	1



LEGEND	
DATA ELEMENTS	NOT
TERMINAL PENETRATION (SEE NOTE 1)	---
PAVED 77 APPROACH SURFACE	---
EXISTING DESIGNED THRESHOLD	---
PROPOSED DESIGNED THRESHOLD	---
PROPOSED SURFACE	---
ADJUSTED NET SLOPE (BY AIR DTD)	---
EXISTING GRADELINE	---
PROPOSED GRADELINE	---
PROPOSED CENTERLINE	---
PROPOSED THRESHOLD LINE	---
PROPOSED FENCE LINE	---



- GENERAL NOTES**
1. TERMINAL PENETRATION INDICATED REFERS TO PENETRATION TO THE PAVED 77 SURFACE ONLY. SEE PM FOR PENETRATION DATA.
 2. THE EXISTING DESIGNED THRESHOLD APPROACH SURFACE IS CLEAR OF ALL OBSTRUCTIONS.
 3. AND IS USED FOR ALL LATERAL/VERTICAL DIMENSIONS UNLESS OTHERWISE NOTED.
 4. ALL DIMENSIONS ARE IN FEET/INCHES/DECIMALS.
- PROPOSED GRADELINE: W 11° 57' 22.89"
 PROPOSED THRESHOLD: W 11° 57' 38.23"
 PROPOSED SURFACE: W 11° 57' 38.05"
 PROPOSED FENCE LINE: W 11° 57' 32.21"

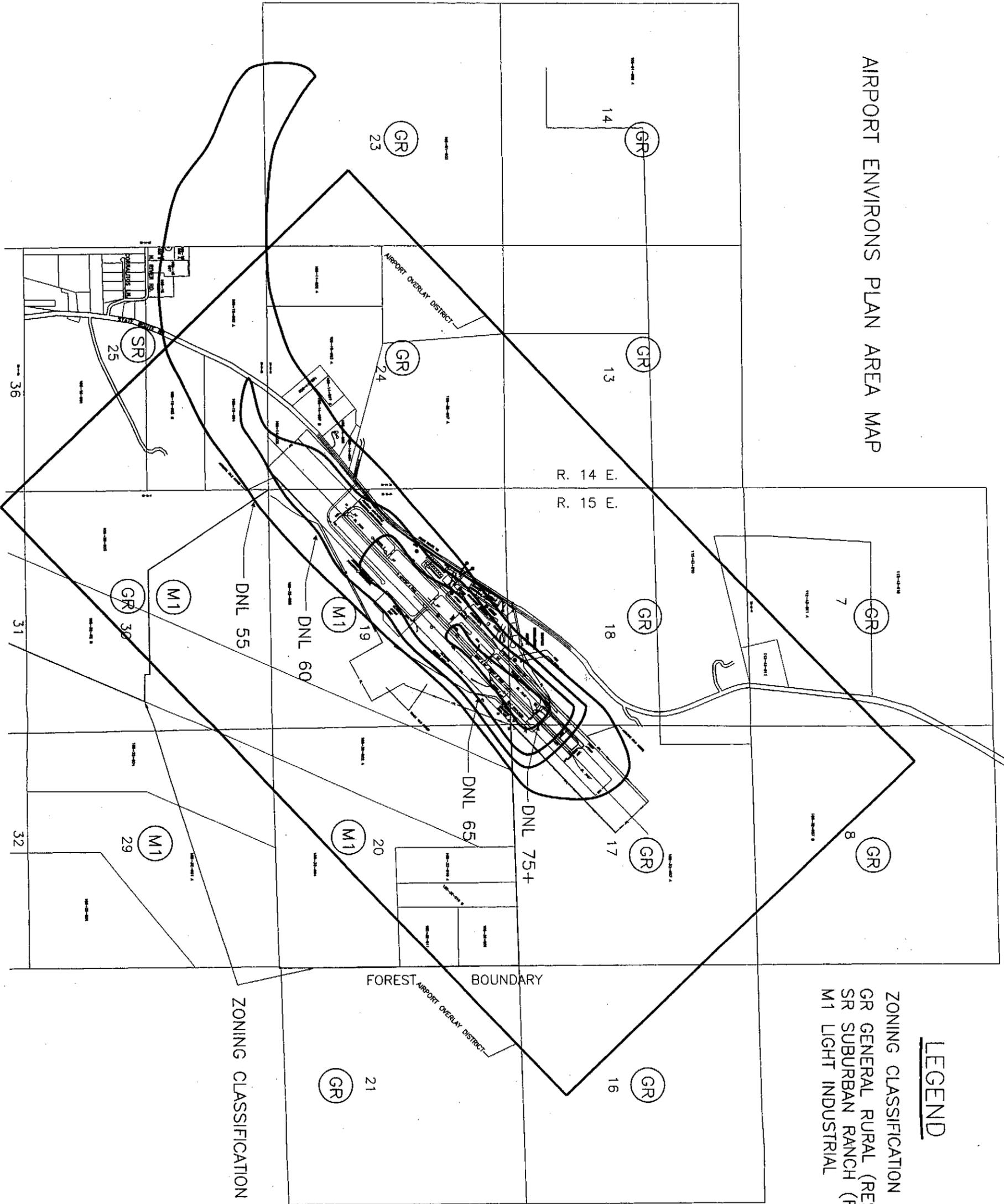
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Rev.	By	Appd.	Date
1	ADDENDUM NO. 1 - EIA FORM 74801		03/02
2	FILE: 5-Hog-rwy-21profile.dwg		12/01

Title: RUNWAY 21 APPROACH PLAN AND PROFILE
 NOGALES INTERNATIONAL AIRPORT
 NOGALES, ARIZONA

AIRPORT ENVIRONS PLAN AREA MAP



LEGEND

- ZONING CLASSIFICATION
- GR GENERAL RURAL (RESIDENTIAL)(1/4.1 ACRES)
 - SR SUBURBAN RANCH (RESIDENTIAL)(1/1.7 ACRES)
 - M1 LIGHT INDUSTRIAL



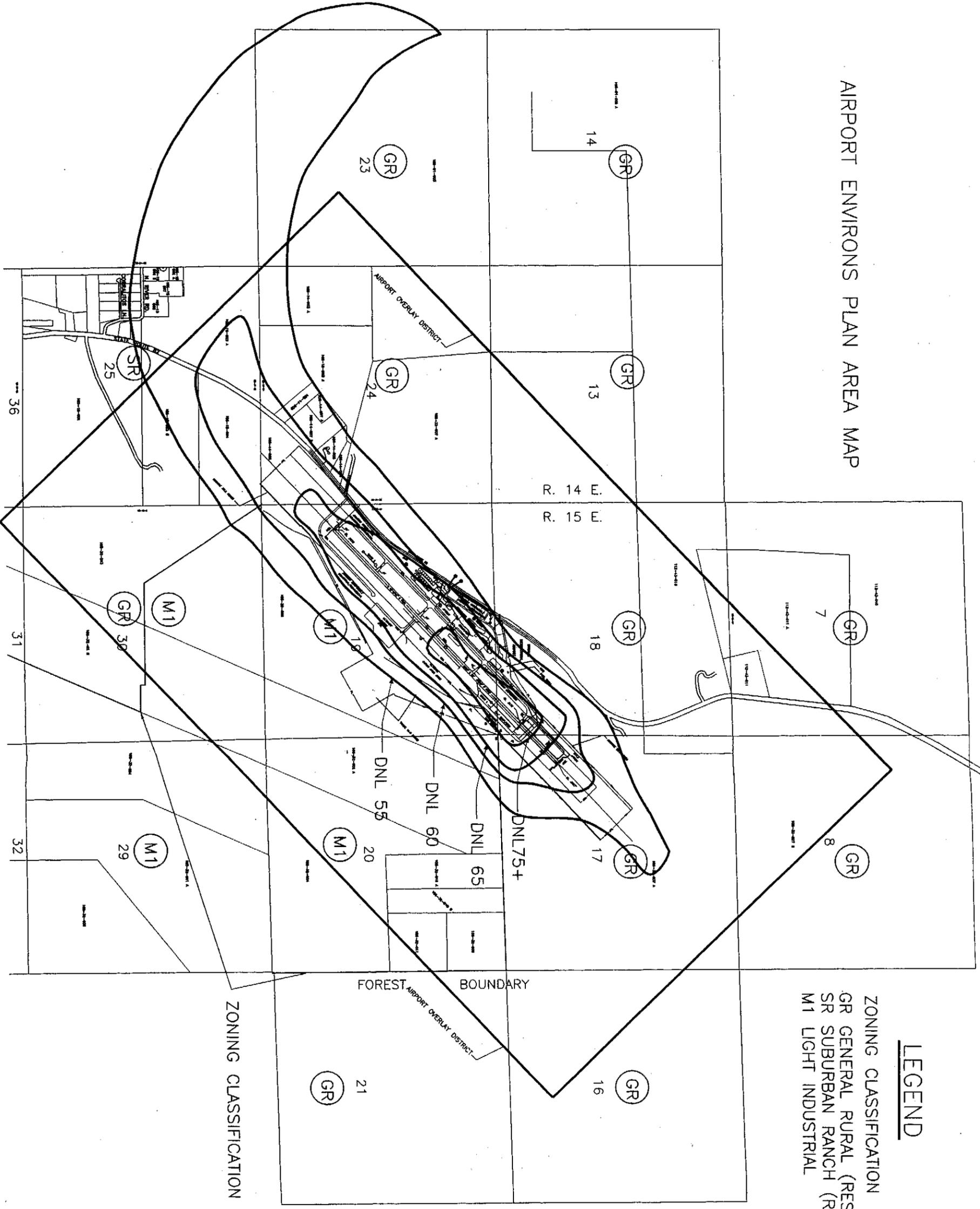
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Tab	Project No.	Scale
1. MASTER PLAN AND AIP UPDATE	81451310	
Revision	By	Appr.
1	UT	PT
		03/02
		Date
		12/01
		Date

OFF-AIRPORT LANDUSE/1999 NOISE MAP
 NOGALES INTERNATIONAL AIRPORT
 NOGALES, ARIZONA

AIRPORT ENVIRONS PLAN AREA MAP



LEGEND

- ZONING CLASSIFICATION
- GR GENERAL RURAL (RESIDENTIAL)(1/4.1 ACRES)
 - SR SUBURBAN RANCH (RESIDENTIAL)(1/1.7 ACRES)
 - M1 LIGHT INDUSTRIAL

ZONING CLASSIFICATION

GENERAL NOTES

1. NORTH ARROW DATA (NAD 83) USED FOR ALL UT/LINE CORRECTIONS.




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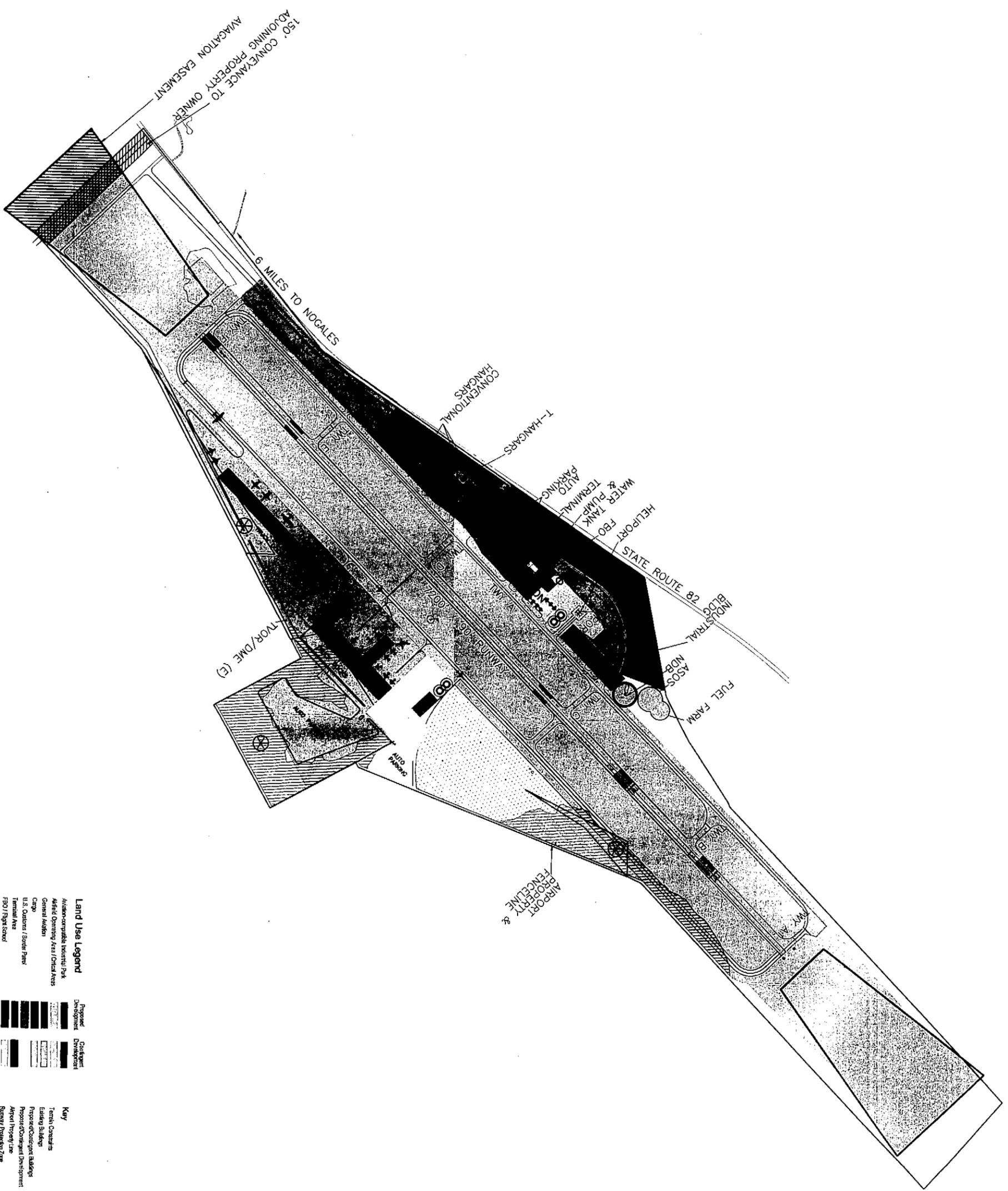
Stattec

1. MASTER PLAN AND AIP UPDATE	UT	PT	03/02
Revision	By	App'd	Date
File Name: Noy-2020-noise.dwg	UT	PT	12/01
Drawn: Design	Design	Design	Date

OFF-AIRPORT LANDUSE 2020 NOISE MAP
NOGALES INTERNATIONAL AIRPORT
NOGALES, ARIZONA

Project No: 81451310
Scale: _____

Drawing No: Sheet 1
Revision: 1



Land Use Legend

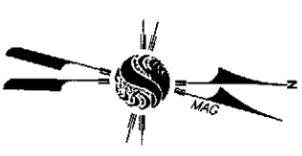
- Aviation-Compatible Industrial Park
- Aviation-Related Office/Industrial
- General Aviation
- U.S. Customs / Border Patrol
- Terminal Area
- FAA/ATIS Tower

Proposed Development

- Terminal
- Concessions
- Garage
- ASOS
- ASOS NDB
- Fuel Farm
- Industrial Bldg 28
- ASOS
- ASOS NDB
- Fuel Farm
- Industrial Bldg 28

Key

- Terminal
- Existing Buildings
- Proposed/Conceptual Buildings
- Proposed/Conceptual Development
- Airport Property Line
- Runway Protection Zone
- Land to be Acquired



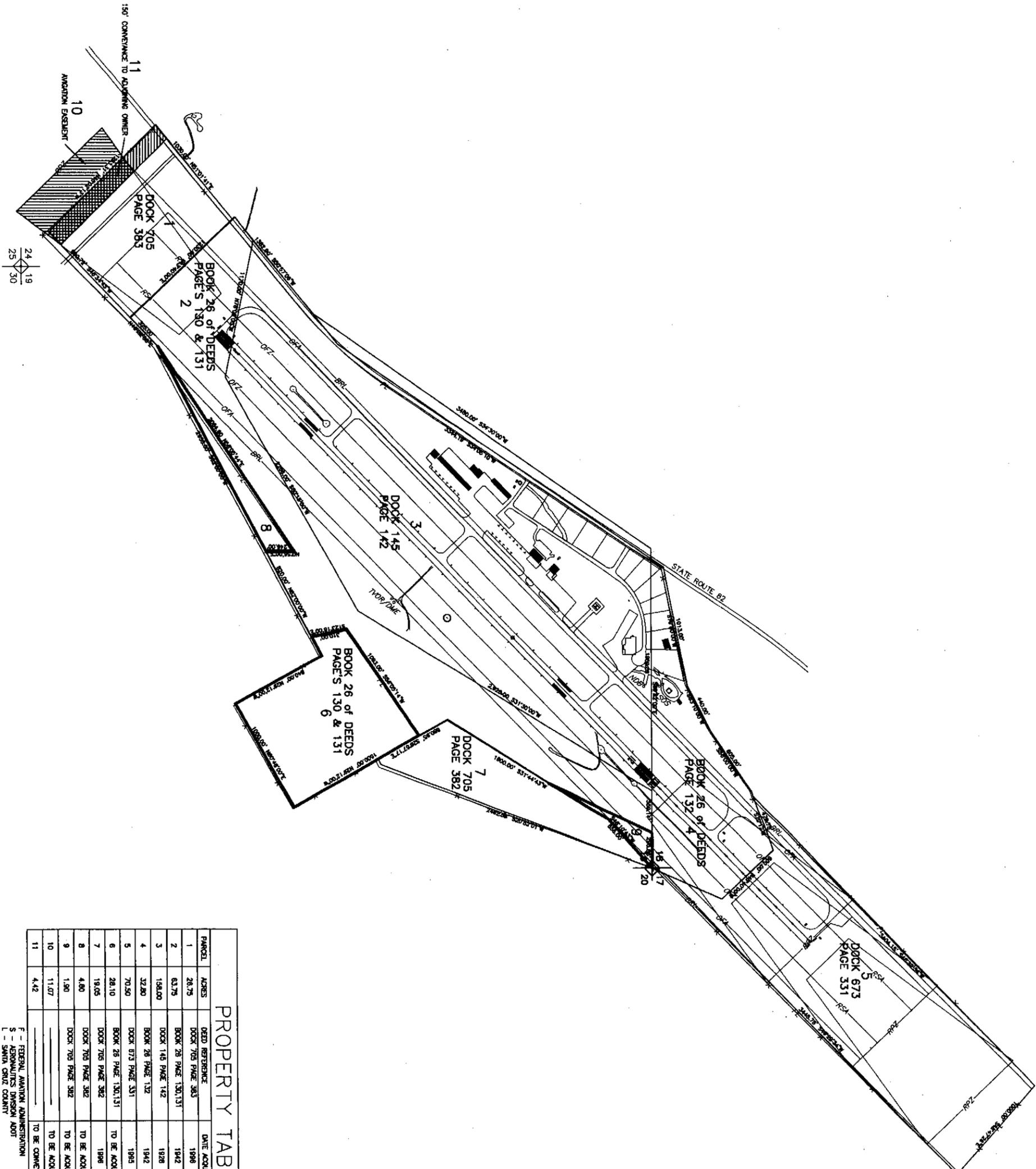
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Rev	By	App'd	Date	Description
1	LI	PT	03/02	MASTER PLAN AND ALP UPDATE

ON-AIRPORT LANDUSE PLAN
NOGALES INTERNATIONAL AIRPORT
NOGALES, ARIZONA

Project No. 81451310
 Scale
 Drawing No. Sheet
 Revision 1



PROPERTY TABLE

PANCEL	ACRES	DEED REFERENCE	DATE ACQUIRED	FUNDING SOURCE	ACQUISITION TYPE
1	26.75	DOCK 705 PAGE 383	1998	F.S.L.	FEE SIMPLE
2	63.75	BOOK 26 PAGE 130,131	1942	L	FEE SIMPLE
3	196.00	DOCK 145 PAGE 142	1928	L	FEE SIMPLE
4	32.80	BOOK 26 PAGE 132	1942	L	FEE SIMPLE
5	70.50	DOCK 673 PAGE 331	1995	F.S.L.	FEE SIMPLE
6	28.10	BOOK 26 PAGE 130,131	TO BE ACQUIRED	F.S.L.	FEE SIMPLE
7	19.05	DOCK 705 PAGE 382	1998	F.S.L.	FEE SIMPLE
8	4.80	DOCK 705 PAGE 382	TO BE ACQUIRED	F.S.L.	FEE SIMPLE
9	1.80	DOCK 705 PAGE 382	TO BE ACQUIRED	F.S.L.	FEE SIMPLE
10	11.07		TO BE ACQUIRED	F.S.L.	EASEMENT
11	4.42		TO BE CONVEYED/OUT	F.S.L.	FEE SIMPLE

F - FEDERAL AIRPORT ADMINISTRATION
 S - SONORA'S AIRPORT
 L - SANTA CRUZ COUNTY



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1. MASTER PLAN AND ALP UPDATE
 Revision: _____
 by: _____
 Date: _____
 The National 1-Stop Program
 Title: _____
 Date: _____
 Design: _____
 Drawn: _____
 Date: _____

Project No. 81451310
 Scale _____
 Drawing No. Sheet _____
P10 10 of 10
 Revision _____
1