Final Environmental Assessment for Runway 8-26 Reconstruction

Volume 1: Chapters 1-6

Rafael Hernandez Airport, Puerto Rico

September 2020

Rafael Hernandez Airport
Runway 8-26 Reconstruction

Final Environmental Assessment

Prepared for:

Puerto Rico Port Authority
and
Federal Aviation Administration

Prepared by:

AECOM

This Environmental Assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

Lee Kyker
Responsible FAA Official

September 1, 2020
Date

September 2020

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ACRONYMS AND ABBREVIATIONS

%	Percent
§	Section
AC	Advisory Circular
AC	Asphalt Concrete
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing Material
ACS	American Community Survey
ADG	Aircraft Design Group
AEDT	Aviation Environmental Design Tool
AIP	Airport Improvement Program
ALP	Airport Layout Plan
APE	Area of Potential Effect
APE-ZC	Karst Zone Special Planning Area
ARPZ	Approach Runway Protection Zone
ASDA	Accelerate-Stop Distance Available
BMP	Best Management Practices
BQN	Rafael Hernandez Airport
CAA	Clean Air Act
CBRS	Coastal Barrier Resource System
CBSA	Core Based Statistical Area
CEQ	Council on Environmental Quality
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESQG	Conditionally-Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CLX	Cargolux Airlines International
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CRAS	Cultural Resources Assessment Survey
CWA	Clean Water Act
CY	Calendar Year
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted Decibels
DNER	Department of Natural and Environmental Resources
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DOT	Department of Transportation
DRPZ	Departure Runway Protection Zone
DSA	Direct Study Area
EA	Environmental Assessment
ECHO	Enforcement and Compliance History Online
EDR	Environmental Data Resources
EIS	Environmental Impact Statement
EJSCREEN	Environmental Justice Screening and Mapping Tool
EO	Executive Order
EPA	US Environmental Protection Agency

EQB	Puerto Rico's Environmental Quality Board
FAA	Federal Aviation Administration
FDX	Federal Express
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System
FONSI	Finding of No Significant Impact
FR	Federal Register
FUDS	Formerly Used Defense Sites
GA	General Aviation
GEC	Lufhansa Cargo
GHG	Greenhouse Gas
ICIS	Integrated Compliance Information System
ISA	Indirect Study Area
JBU	Jet Blue Airways
kg	Kilogram
km	Kilometer
kVA	Kilo-Volt-Ampere
LBP	Lead-Based Paint
LDA	Landing Distance Available
LOS	Levels of Service
LR	Load-restricted
MGD	Million Gallons Per Day
MOA	Memorandum of Agreement
MOS	Modification of [Design] Standard
MPH	Martinair Holland
MSA	Metropolitan Statistical Area
MSGP	Multi-Sector General Permit
MTOW	Maximum Take-Off Weight
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NAVAID	Navigational Aid
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NKS	Spirit Airlines
NLR	Noise Level Reduction
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPIAS	National Plan of Integrated Airport Systems
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWSRS	National Wild and Scenic Rivers System
O_3	Ozone
OGPe	Puerto Rico Permit Management Office
OPSNET	Operations Network

PAPI	Precision Approach Path Indicators
Pb	Lead
PCC	Portland Cement Concrete
PCI	Pavement Condition Index
PM_{10}	Particulate Matter Equal to or Less than 10 Micrometers
$PM_{2.5}$	Particulate Matter Equal to or Less than 10 Micrometers
ppb	Parts Per Billion
ppm	Parts Per Million
PR LUST	Puerto Rico Leaking Underground Storage Tank
PR UST	Puerto Rico Underground Storage Tank
PRASA	Puerto Rico Aqueduct and Sewer Authority
PRCZMP	Puerto Rico Coastal Zone Management Program
PREPA	Puerto Rico Electric Power Authority
PRPA	Puerto Rico Port Authority
PRPB	Puerto Rico Planning Board
PRSHPO	Puerto Rico State Historic Preservation Office
RCRA	Resource Conservation and Recovery Act
REIL	Runway End Identification Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
SAC	Strategic Air Command
SEMS-ARCHIVE	Superfund Enterprise Management System Archive
SO_2	Sulfur Dioxide
SOC	Standard Occupational Classification
SO_x	Sulfur Oxides
SPCC	Spill Prevention Control and Countermeasure Plan
SSA	Socioeconomic Study Area
STP	Shovel Test Pit
SWPPP	Stormwater Pollution Prevention Plan
TAF	Terminal Area Forecast
TIP	Transportation Improvement Program
TODA	Take-Off Distance Available
TORA	Take-off Run Available
U.S.C.	United States Code
UAL	United Airlines
US	United States
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USFWS	US Fish and Wildlife Service
VOC	Volatile Organic Compounds
VORTAC	VHF Omnidirectional Range/Tactical Air Navigation System
µg/m3	Micrograms per Cubic Meter

CHAPTER 1 INTRODUCTION

Puerto Rico Port Authority (PRPA) (i.e., the Airport Sponsor) is undertaking this Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA). The EA is being completed to support the proposed reconstruction of Runway 8-26 at the Rafael Hernandez Airport (i.e., BQN, or the Airport), hereinafter referred to as the Proposed Project. The purpose of the EA is to identify and consider the potential environmental impacts associated with the Proposed Project and any reasonable alternatives.

This chapter provides a summary overview and history of BQN, including a summary of existing facilities and current/projected activity levels. Actions comprising the Proposed Project evaluated in this EA are also detailed.

1.1. AIRPORT DESCRIPTION AND BACKGROUND

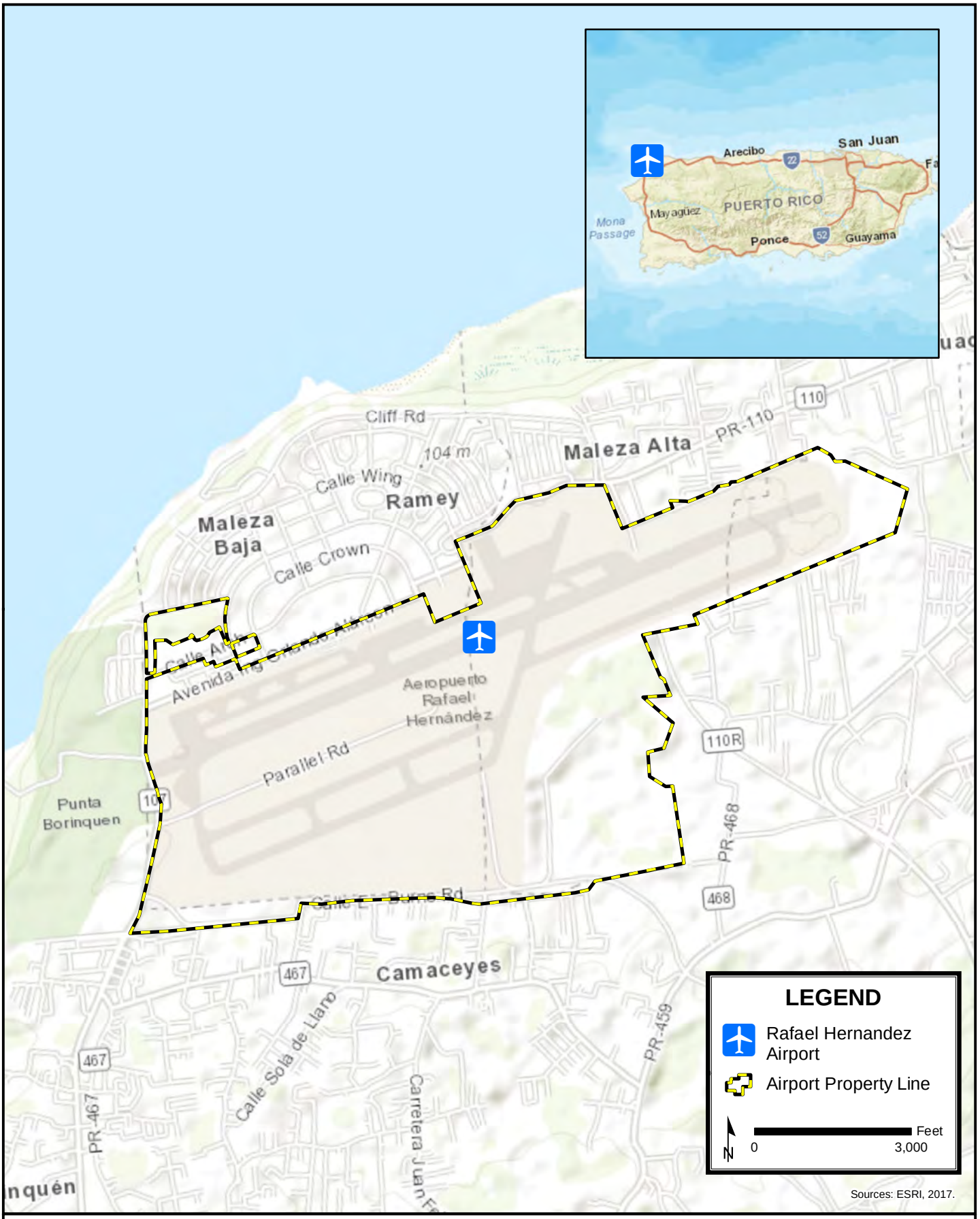
BQN is one of nine public airports located within the Commonwealth of Puerto Rico and is located approximately 75 miles west of San Juan and four miles northeast of the City of Aguadilla on the northwestern coast of Puerto Rico. **Figure 1.1-1** depicts the location of BQN.

BQN previously served as the Ramey Air Force Base under the control of the United States (US) Air Force Strategic Air Command (SAC) until 1974. It was then converted into a civilian airport. The Borinquen Air Station, operated by the US Coast Guard (USCG), as well as the 141st Air Control Squadron Mobile Radar Unit of the Puerto Rico Air National Guard, resides at BQN. In its current commercial service capacity, BQN currently services United, Jet Blue and Spirit Airlines as well as various air cargo operators including FedEx, Caribe Express and small air taxi and cargo operators. BQN is also used as a refueling stopover by Lufthansa Cargo, Cargo Lux, and Martin Air for flights to and from South America and Europe.

The Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems (NPIAS) report identifies five-year funding needs for airports eligible to receive Airport Improvement Program (AIP) grants. Each airport is classified based on annual enplanements (departing passengers). The 2017-2021 NPIAS classifies BQN as a primary non-hub airport, defined as having less than 0.05 percent (%) of all commercial passenger enplanements but with more than 10,000 annual enplanements[1].

The existing critical aircraft at BQN is the DC-10 used by FedEx for cargo operations. The DC-10-30 was used to determine FAA design and safety standards for Runway 8-26, the existing parallel taxiways and cargo apron. The DC-10-30 has a published approach speed of 145 knots, which places it Aircraft Approach Category D and a wingspan of 165 feet which places it within Aircraft Design Group (ADG) IV.

[1] *Report to Congress: National Plan of Integrated Airport Systems (NPIAS) 2017–2021 Appendix A*. FAA, September 2016.



Path: C:\Users\paul.sanford\Desktop\BQN\GIS\mxd\Purpose and Need and Alternatives\180615_Figure 1-1-1 Airport Location_rev0.mxd, Date Saved: 6/15/2018 2:13:01 PM

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

AIRPORT LOCATION

FIGURE
1.1-1

The future critical aircraft for planning purposes is the Boeing 747-400. Business jet and general aviation (GA) facilities available at BQN accommodate the largest types of business/GA aircraft. The critical aircraft for design purposes is a C-II aircraft (Gulfstream IV).

1.1.1. EXISTING AIRPORT FACILITIES AT BQN

The BQN Airport Reference Point is located at 18°29'41.50" N Latitude and 67°07'46.00" W Longitude. Primary airside and landslide facilities supporting operations at BQN are described in the following sections. BQN's current Airport Layout Plan (ALP) is included as **Figure 1.1-2**.

1.1.1.1. Airside Facilities

Airside facilities include the system of runways, taxiways, navigational aids (NAVAIDs), weather aids, and air traffic control facilities that facilitate aircraft operations. Taken together, the following airfield features support current operations at BQN.

Runways

Runway 8-26 is 11,700 feet long by 200 feet wide with 50-foot shoulders. The center section of the runway between 2,000 feet and 8,000 feet is comprised of six to eight inches of Portland Cement Concrete (PCC), with Asphalt Concrete (AC) overlay with thicknesses varying between three and six inches. The runway is serviced primarily by two partial parallel taxiways, Taxiway A and Taxiway M, as well as a traverse diagonal Taxiway C, which ties in with Taxiways E and G providing access to the southwestern apron area.

Runway 8-26 currently is a non-precision instrument approach runway of Aircraft Approach Category D and ADG V. Runway 8-26 and Taxiway A are separated by 405 feet, which meets FAA design standards for taxiway separation per Advisory Circular (AC) 150/5300-13A, Change 1 for ADG V aircraft. Cargolux Airlines operates the B747-8, an ADG VI aircraft at BQN, which is in contravention of taxiway separation design standards because the required separation is 500 feet compared to 405 feet available. To meet the standard, either the runway, or taxiway, or both would need to be relocated. Therefore, the FAA conditionally approved a Modification of Design Standard (MOS) to allow operations of this aircraft, with conditions on taxiing operations[2].

Taxiways

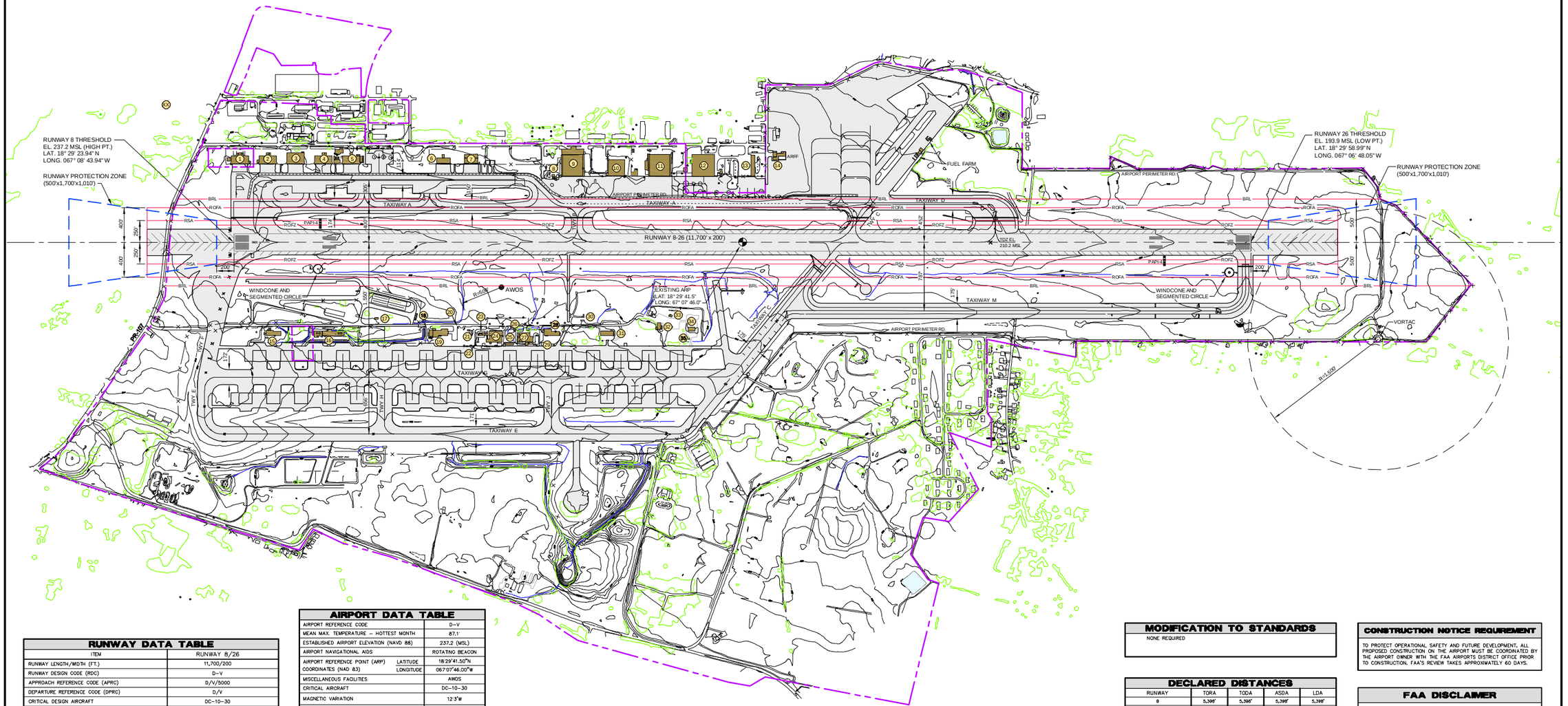
Runway 8-26 is serviced by two partial parallel taxiways: Taxiway A and Taxiway M. Taxiway A, located north of the runway, is approximately 9,000 feet in length and 75 feet in width with 37.5-foot paved shoulders. Taxiway A provides access to the existing hangars, commercial terminal facility and cargo facilities.

[2] Modification of Airport Design Standards for the B747-8 at Rafael Hernandez Airport (BQN), conditionally approved January 25, 2013.

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

2006 AIRPORT LAYOUT PLAN



RUNWAY DATA TABLE

ITEM		RUNWAY 8/26	
RUNWAY LENGTH/WIDTH (FT.)		11,700/200	
RUNWAY DESIGN CODE (RDC)		D-V	
APPROACH REFERENCE CODE (APRC)		D/V/5000	
DEPARTURE REFERENCE CODE (DPRC)		D/V	
CRITICAL DESIGN AIRCRAFT		DC-10-30	
EFFECTIVE GRADIENT (%)		.037	
% WIND COVERAGE		(SEE WIND ROSE TABLES)	
RUNWAY PAVEMENT	STRENGTH (000 lbs.)	455 DOUBLE TANDEM	
	PCN	23 R/B/W/T	
	SURFACE TYPE/FRICTION	CONCRETE/ASPHALT	
MAXIMUM RUNWAY ELEVATION (ABOVE MSL)		237.2	
RUNWAY LIGHTING		MIRL	
RUNWAY MARKING		NON-PRECISION	
RUNWAY ENDS		8	26
END ELEVATIONS (NAVD 88) (MSL)		237.2	193.9
END COORDINATES (NAD 83)	LATITUDE	18°29'23.94"N	18°29'58.99"N
	LONGITUDE	067°08'43.94"W	067°06'48.05"W
DISPLACED THRESHOLD ELEVATIONS (NAVD 88) (MSL)		N/A	N/A
DISPLACED THRESHOLD COORDINATES (NAD 83)	LATITUDE	N/A	N/A
	LONGITUDE	N/A	N/A
DATUM	HORIZONTAL	NAD83	NAD83
	VERTICAL	NAVD88	NAVD88
RUNWAY PROTECTION ZONE (RPZ)	LENGTH	1,700'	1,700'
	WIDTH-INNER/OUTER	500'/1,010'	500'/1,010'
APPROACH LIGHTING		NONE	NONE
RUNWAY TOUCH DOWN ZONE ELEVATIONS (MSL)		237.2	210.2
C.F.R. PART 77 IMAGINARY AIRSPACE SURFACES	APPROACH CATEGORY	NON-PRECISION	NON-PRECISION
	APPROACH SURFACE SLOPES	34:1	34:1
RUNWAY DEPARTURE SURFACE		YES	YES
THRESHOLD SITING SURFACE		20:1	20:1
NAVAIDS	ELECTRONIC NAVIGATION AIDS	VORTAC, GPS	VORTAC, GPS
	VISUAL APPROACH AIDS	PAPI-4	PAPI-4
TYPE OF INSTRUMENT APPROACH		RNAV (GPS)	RNAV (GPS)
TYPE OF SURVEY REQUIRED		N/A	N/A
APPROACH VISIBILITY MINIMUMS		760 FEET/1 MILE	620 FEET/1 MILE
RUNWAY SAFETY AREA (RSA) W=WIDTH BRE=BEYOND RUNWAY END		W=500' BRE=1,000'	
RUNWAY OBJECT FREE AREA (ROFA) W=WIDTH BRE=BEYOND RUNWAY END		W=800' BRE=1,000'	
RUNWAY OBSTACLE FREE ZONE (ROFZ) W=WIDTH BRE=BEYOND RUNWAY END		W=400' BRE=200'	

AIRPORT DATA TABLE

AIRPORT REFERENCE CODE		D-V
MEAN MAX. TEMPERATURE – HOTTEST MONTH		87.1°
ESTABLISHED AIRPORT ELEVATION (NAVD 88)		237.2 (MSL)
AIRPORT NAVIGATIONAL AIDS		ROTATING BEACON
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	18°29'41.50"N
	LONGITUDE	067°07'46.00"W
MISCELLANEOUS FACILITIES		AWOS
CRITICAL AIRCRAFT		DC-10-30
MAGNETIC VARIATION		12°3'W
DATE OF MAGNETIC VARIATION		05/25/2005
AIRPORT ROLE (NPIAS)		PRIMARY COMMERCIAL
AIRPORT ACREAGE		–

BUILDING/TENANT INDEX

NO.	DESCRIPTION	ELEVATION (FT.) MSL (ESTIMATED)
1	CORPORATE HANGAR	–
2	CORPORATE HANGAR	–
3	CORPORATE HANGAR	–
4	CORPORATE HANGAR	–
5	CORPORATE HANGAR	–
6	COAST GUARD	–
7	COAST GUARD	–
8	AIR TRAFFIC CONTROL TOWER	–
9	TERMINAL BUILDING	–
10	CARGO BUILDING	–
11	CARGO BUILDING	–
12	BULK HANGAR	–
13	BUILDING	–
14	ARFF BUILDING	–
15	BUILDING (#1251)	–
16	BUILDING (#1245)	–
17	BUILDING (#3)	–
18	BUILDING (#1104)	–
19	BUILDING (#1032)	–
20	BUILDING (#6)	–
21	BUILDING (#1121)	–
22	BUILDING (#9)	–
23	BUILDING (#1133)	–
24	BUILDING (#1128)	–
25	BUILDING (#11)	–
26	BUILDING (#13)	–
27	BUILDING (#1129)	–
28	BUILDING (#1071)	–
29	BUILDING (#15)	–
30	BUILDING (#1089)	–
31	BUILDING (#1070)	–
32	BUILDING (#1029)	–
33	BUILDING (#1031)	–
34	BUILDING (#1072)	–
35	BUILDING (#1073)	–

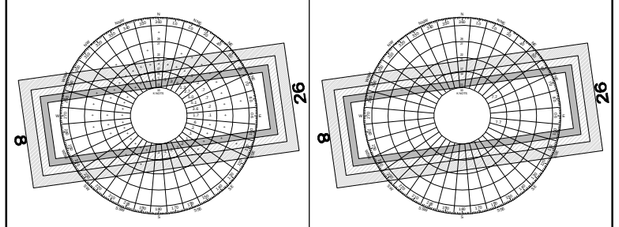
NOTES:

1. BASE MAP 2003 AERIAL PHOTOGRAMMETRY MAPPING/SURVEY.
2. ALL ELEVATIONS ARE IN FEET (MSL).
3. HORIZONTAL DATUM NAD83, VERTICAL DATUM NAVD88.
4. DRAWING PREPARED IN PUERTO RICO AND VIRGIN ISLANDS, US FOOT (PRVIF).
5. NO THRESHOLD SITING SURFACE PENETRATIONS.
6. NO RUNWAY OBJECT FREE ZONE (ROFZ) PENETRATIONS.

LEGEND

ITEM	EXISTING
AIRPORT PROPERTY LINE	
AIRFIELD PAVEMENT	
BUILDINGS	
ROADS & PARKING	
FENCE	
RUNWAY SAFETY AREA	RSA
RUNWAY OBJECT FREE AREA	ROFA
OBSTACLE FREE ZONE	ROFZ
BUILDING RESTRICTION LINE	BRL
PAPI	
THRESHOLD LIGHTS	
REIL	
AIRPORT REFERENCE POINT (ARP)	
TREELINE	
2' GROUND CONTOUR	
WATER	

WIND ROSE



ALL WEATHER WIND ROSE
10.5 KTS/12 MPH: 98.03%
13 KTS/15 MPH: 99.24%
16 KTS/18 MPH: 99.90%
20 KTS/23 MPH: 99.98%
OBSERVATIONS: 86,000

PRECISION IFR WIND ROSE
10.5 KTS/12 MPH: 100.0%
13 KTS/15 MPH: 100.0%
16 KTS/18 MPH: 100.0%
20 KTS/23 MPH: 100.0%
OBSERVATIONS: 12

PERIOD OF RECORD: 1993-2002 LUIZ MUNOZ MARIN INTERNATIONAL AIRPORT STATION #11641

MAGNETIC VARIATION
12° 3'W

GRAPHIC SCALE
0 300 600 1200 2400
(IN FEET)
1 inch = 600 ft.

MODIFICATION TO STANDARDS

NONE REQUIRED

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	5,398'	5,398'	5,398'	5,398'
26	5,398'	5,398'	5,398'	5,398'

TAXIWAY DATA TABLE

TAXIWAY (TDG 2)	WIDTH	T.S.M.	SHOULDER	T.S.A.	T.O.F.A.	LIGHTING
A	35'	7.5'	15'	79'	131'	MITL
A1	35'	7.5'	15'	79'	131'	MITL
A2	35'	7.5'	15'	79'	131'	MITL
A3	35'	7.5'	15'	79'	131'	MITL
A4	35'	7.5'	15'	79'	131'	MITL
A5	35'	7.5'	15'	79'	131'	MITL

CONSTRUCTION NOTICE REQUIREMENT

TO PROTECT OPERATIONAL SAFETY AND FUTURE DEVELOPMENT, ALL PROPOSED CONSTRUCTION ON THE AIRPORT MUST BE COORDINATED BY THE AIRPORT OWNER WITH THE FAA AIRPORTS DISTRICT OFFICE PRIOR TO CONSTRUCTION. FAA'S REVIEW TAKES APPROXIMATELY 60 DAYS.

FAA DISCLAIMER

THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FAA APPROVAL BLOCK

AIRPORT SPONSOR APPROVAL

PUERTO RICO PORTS AUTHORITY

(SIGNATURE) _____ DATE: _____

NAME: _____

TITLE: _____

FIGURE
1.1-2

C:\Civil 3D Projects\FIG 1.1-2.dwg 06/22/2020 16:22

Taxiway D is an eastward extension of Taxiway A that connects to the runway just east of Taxiway C. Taxiway C is a transverse diagonal taxiway, is closed to aircraft taxiing, and provides access from Runway 8-26 to the south side of the airfield. A portion of Taxiway A is considered to be an apron edge taxilane in front of the commercial and cargo facilities and does not have paved shoulders. Taxiway M, located south of the runway, is 175 feet wide.

Taxiway F connects the Runway 8 threshold south to Taxiways G and E, which each provide connectivity to the southwest apron areas. Stub connector taxiways across the airfield include Taxiway B providing runway exit access to Taxiway A, and Taxiways H and J which provide north-south connection with Taxiways G and E.

Aircraft Parking Aprons

Existing aircraft parking apron space at BQN is divided into a commercial apron, cargo apron, business/GA apron, a government/municipal apron, and an "other/no-use" apron. The commercial apron is approximately 10,800 square yards and can accommodate up to two B757 type aircraft. The cargo apron is approximately 28,000 square yards and can accommodate FedEx DC-10, Tradewinds L-1011 and a Tradewinds A-300 cargo aircraft simultaneously. The apron used by government/municipal agencies is approximately 23,000 square yards and located east of the cargo apron. The business/GA apron is approximately 24,000 square yards and is directly in front of the corporate hangars near the approach end of Runway 8. The "other/no-use" apron is approximately 444,000 square yards and consists of the "Charlie" parking apron on the northeast side of the Airport and 30 parking stubs on the south side of the Airport.

Other Facilities

BQN has a Very-high Frequency Omnidirectional Range with Tactical Navigation equipment (VORTAC) located approximately 1,800 feet southeast of the Runway 26 threshold. The VORTAC is an electric navigation aide to operations at BQN that provides valuation information for the approaches into BQN. The BQN VORTAC also serves as an important function for aircraft passing over the facility, as several instrument flight rules routes use the VORTAC.

In addition to the VORTAC, visual NAVAIDs located at BQN include pavement marking, runway lighting, runway end identification lights (REILs), precision approach path indicators (PAPIs), wind cones, segmented circles and rotating beacons. Runways 8 and 26 both have four-box PAPIs and supplemental wind cones. Runway 8 also has REILs that can be activated via the common traffic advisory frequency. A segmented circle is co-located at both runway ends with the supplemental wind cones. A rotating green-white-green beacon is also located on the airfield on top of the abandoned air traffic control tower.

1.1.1.2. Landside Facilities

BQN is accessed from the east via Puerto Rico Highway 2 to Puerto Rico Route 110. Access from Highway 2 to BQN via Route 110 is not direct. Route 110 is a two-lane roadway that loops

around the end of Runway 26 to connect to the interior road network of the old Ramey Air Force Base (i.e., Wing Road and Hangar Road) which ultimately leads to a majority of the existing landside facilities at BQN. BQN is accessed from the City of Aguadilla to the south via Puerto Rico Route 107 which then connects with the interior road network of the old Ramey Air Force base. A portion of Route 107 passes through a 1,000-foot paved overrun to Runway 26. Route 107 is a two-lane roadway that, unlike Route 110, provides direct access to the BQN facilities.

Primary landside facilities at BQN include 51 buildings, 17 of which were vacant as of 2005, and a fuel farm. Direct airfield users include users of the passenger terminal facility, air cargo operators, and the Western Aviation Services Corporation which is the Fixed Based Operator at BQN. The Borinquen Air Station is operated by the USCG whose primary roles are search and rescue, secondary law enforcement, aerial support for the Aids to Navigation program and logistic support.

The fuel farm, located in the northeastern portion of the airfield across from the Aircraft Rescue and Fire Fighting facility, has approximately 199,000 gallons of fuel capacity in fourteen tanks that are operated by two tenants. Petro Air operates five JetA tanks with capacities of 20,000 gallons each, one Aviation Gasoline tank with a 12,000-gallon capacity, and one diesel tank with an 8,000-gallon capacity. COPECA Jet Center operates five JetA tanks, each with a 15,000-gallon capacity, one 2,000-gallon capacity gasoline tank, and one 2,000-gallon capacity diesel tank.

1.1.2. AVIATION ACTIVITY AT BQN

According to the FAA Operations Network (OPSNET) database, a total of 41,213 aircraft operations were conducted in 2019. Additionally, the FAA's Terminal Area Forecast (TAF) is the official forecast of aviation activity for US airports and is used for the budgeting and planning needs of the FAA. Currently, the TAF summarizes activity between 1990 and 2045 at BQN. **Table 1.1-1** presents a consolidated summary of the aircraft operational forecasts for years pertinent to this EA.

Table 1.1-1 Baseline and Forecast Operations

Category	Year		
	2019	**2024**	**2029**
Air Carrier	4,655	5,648	6,614
Air Taxi/Commuter	3,228	2,977	3,362
GA	23,400	24,531	25,009
Military	9,930	11,928	11,928
Total	**41,213**	**45,084**	**46,913**

Sources: OPSNET 2020 (baseline year); FAA Terminal Area Forecast 2018 (future years).

1.2. DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project and associated airfield improvements would provide an air carrier runway of sufficient strength and adequate length to accommodate existing and future operations of the existing and projected future aircraft fleet at BQN. Once completed, the runway would comply with all current FAA design and safety standards. The Proposed Project would also provide an air

carrier runway of sufficient strength and adequate length to accommodate existing and future operations of the existing and projected future aircraft fleet at BQN during rehabilitation and reconstruction activities. Large portions of the existing runway show signs of pavement deterioration and ponding is present along the length of the runway. As a result of this condition, BQN is not in compliance with 14 Code of Federal Regulations (CFR) Section (§) 139.305(a)(6). The Proposed Project would reconstruct the runway to achieve compliance, as discussed below and in detail in **Chapter 3**.

Based on planning information generated to date, Runway 8-26 reconstruction can feasibly be accomplished in two principal ways:

- Construct temporary Runway 8-26, rehabilitate existing runway, and restore operations to newly reconstructed existing runway. To implement, convert Taxiway M to a temporary 11,000-foot by 150-foot AC runway, 70 feet north of its existing centerline. Correct crown section on Taxiway M to correct longitudinal grade. Reconstruct Runway 8-26 to 11,000 feet by 150 feet of PCC with crown section and runway grooving. This generalized concept, known as Alternative 1A for the purposes of this EA, represents the temporary runway option. A more detailed analysis of Alternatives to implement this option are described in **Section 3.1**.

- Construct new permanent Runway 8-26 to replace the existing Runway 8-26. To implement, construct 11,000 feet by 200 feet AC runway, 500 feet south of existing Runway 8-26 centerline. Convert existing Runway 8-26 to full length-parallel taxiway. This generalized concept, known as Alternative 2A for the purposes of this EA, represents the permanent runway option. A more detailed analysis of Alternatives to implement this option are described in **Section 3.1**.

1.3. ENVIRONMENTAL DOCUMENTATION

The FAA is responsible for complying with NEPA and approving Federal actions and Federal grants-in-aid for proposed airport development projects. All airport improvement projects which involve Federal funding, or other major Federal action, must comply with the NEPA, the Airport and Airway Improvement Act of 1982, as amended and any other pertinent laws and regulations.

In accordance with NEPA, the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR parts 1500 – 1508, and per the requirements of FAA Orders 1050.1F, *Environmental Impacts*, *Policies and Procedures* and 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions*, the PRPA has prepared this EA to assess and document potential environmental, social, and economic effects associated with the Proposed Project. Once comments received on this EA from the FAA, government agencies, interested organizations, and the general public have been reviewed and considered, the FAA will evaluate the Final EA and a decision will be made as to whether to issue a Finding of No Significant Impact (FONSI), or to render a decision to prepare an Environmental Impact Statement (EIS).

The format and content of this EA conforms to 40 CFR parts 1500 – 1508 and FAA Order 1050.1F and is organized as follows:

- Chapter 1.0, Introduction: identifies the Proposed Project, the EA process, and relevant background information;
- Chapter 2.0, Purpose and Need: discusses the Proposed Project in the context of its overarching purpose and why it is needed;
- Chapter 3.0, Alternatives: identifies and screens reasonable alternatives to the Proposed Project considered as part of the environmental evaluation process. The identification and screening process typically involves a discussion of the evaluation criteria, alternatives eliminated from further consideration and reasonable alternatives retained for further study;
- Chapter 4.0, Affected Environment and Environmental Consequences: describes baseline environmental conditions within the EA study areas. Presents and compares potential environmental impacts associated with the Proposed Project, reasonable alternatives, and the No-Action Alternative. Summarizes mitigation options considered where necessary and proposes a conceptual mitigation program for retained Alternatives; Assesses the potential for effects of the Proposed Project and Alternatives to accumulate in conjunction with other past, present or reasonably foreseeable future actions occurring at or surrounding BQN.
- Chapter 5.0, Coordination and Public Involvement: presents information on the coordination and public involvement steps undertaken throughout the EA process, including a listing of Federal, state, and local agencies and other interested parties receiving early coordination material and a copy of the Draft EA;
- Chapter 6.0, List of Preparers: lists preparers of the EA;
- Chapter 7.0, References: provides citations for reference material used during EA preparation; and
- Appendices: as needed, for technical information, coordination records and other materials.

CHAPTER 2 PURPOSE AND NEED

Presented herein is a concise statement of purpose for the Proposed Project as detailed in **Section 1.2**, a series of substantiating points as to why the Proposed Project is needed and will be of benefit to BQN and its users, and an itemized summary of Federal actions requested of the FAA in reviewing this EA.

2.1. AIRPORT SPONSOR'S PURPOSE AND NEED

The Airport Sponsor's purpose for the Proposed Project, as well as the underlying need for each set of improvements, is described in the following sections.

2.1.1. PURPOSE

The purpose of the proposed runway and associated airfield improvements is twofold: 1) provide an air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN; and 2) maintain adequate runway length for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and reconstruction.

2.1.2. NEED

Runway Pavement Conditions

A 2004 pavement evaluation[3] concluded that the PCC sections on both ends of the runway are in good condition with Pavement Condition Index (PCI) values of 88 (i.e., "Good"), but the AC overlay sections across the approximate 8,200-foot center portion had PCI values ranging from 0 to 13 (i.e., "Failed"). The two-inch asphalt overlay had totally failed and the underlying asphalt was heavily oxidized. It was also determined that based on PCC modulus values the PCC underlying the asphalt pavement must be removed and replaced.

A pavement condition study was subsequently conducted by the US Air Force in 2013[4], noting that although approximately 4,000 feet within this section of the runway has been repaired, a 2,000-foot section has a PCI Rating of "Very Poor" (i.e., less than 40) causing a 25% reduction in adjusted gross loads for aircraft using the runway. In that same year, an airport inspection was conducted by the FAA[5] in accordance with 14 CFR Part 139 and revealed that BQN was not in compliance with 14 CFR § 139.305(a)(6):

> *"Ponding was observed along the length of Runway 8-26. The runway needs to be crowned and grooved to avoid standing water. Runway grooving is needed to eliminate hydroplaning on the wet runway, resulting in shorter braking distance*

[3] *Final Pavement Evaluation Report, Runway 8-26, Rafael Hernandez International Airport (BQN), Aguadilla, Puerto Rico*. Prepared by DMJM Aviation, Inc., June 2004.
[4] *Airfield Pavement Summary*. Prepared by US Air Force, February 2013.
[5] Letter of Correction from Charlotte Jones, FAA Southern Region, to Edgar Sierra, Rafael Hernandez Airport, regarding CY 2013 14 CFR Part 139 Compliance Inspection, EIR Number: 2013SO800102, September 10, 2013.

> *of aircraft on wet pavement. The pavement condition of the runway is poor and must be addressed. Although Foreign Object Debris was not found on the runway, it needs to be resurfaced. The certificate holder must develop a project to correct the pavement condition [by Dec 16, 2013]. An overlay should be designed to build up the centerline and create a crowned section with a shortened drainage length"*

Subsequent analysis as part of the PRPA Regional Airports Pavement Maintenance and Management Program[6] corroborated previous PCI reports, the results of which are shown on **Figure 2.1-1**. The Program further forecasted that additional sections of Runway 8-26 would degrade to "Very Poor" rating by 2021.

Runway Length Requirements

Recent analysis of runway take-off length requirements for existing and future operations at BQN indicates that the existing runway length of 11,700 feet is sufficient for all passenger and cargo aircraft flying to the continental US to operate at 100% load factors. With the exception of the B747-800, long-range international cargo aircraft take-off operations are restricted to no more than 90% of maximum payload capacity (**Table 2.1-1**). Existing available landing lengths on the runway are sufficient for fleet operations even under hottest day/wettest conditions.

The runway length analysis concluded that payload restrictions would begin to occur for domestic passenger aircraft at a length of 9,050 feet Take-Off Run Available (TORA), and that at this length long-range international cargo aircraft would operate with load factors between 64% and 74%, which is considered to be unprofitable to cargo operators. Cargo operators that would experience this level of payload restriction have indicated that a minimum 10,500 feet of useable runway take-off length is required; else these operators may elect to use an alternative airport.

2.1.3. FAA DESIGN AND SAFETY STANDARDS

Runway Protection Zones

The Runway Protection Zone (RPZ) is a trapezoidal area at each runway end and/or threshold. The main purpose of RPZs is to protect people and property on the ground. According to FAA AC 150/5300-13A (2012), the FAA recommends airports gain an interest in RPZs, such as fee title, lease, or avigation easement. While it is desirable to keep the entire RPZ clear of all above-ground objects, RPZs should be maintained clear of all incompatible activities at a minimum. Per FAA guidance, permissible land uses within RPZs include: farming, irrigation channels, airport service roads, underground facilities and unstaffed NAVAIDs (only if fixed by function). The FAA also recommends airports coordinate with the Airports District Office to remove or mitigate the risk of any existing incompatible land uses in the RPZ as practical, including public roads.

[6] *Regional Airport Pavement Maintenance and Management Program, Rafael Hernandez Airport (BQN)*. Prepared by Kimley-Horn and Associates, Inc., June 2016.

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

2016 PAVEMENT CONDITION INDEX

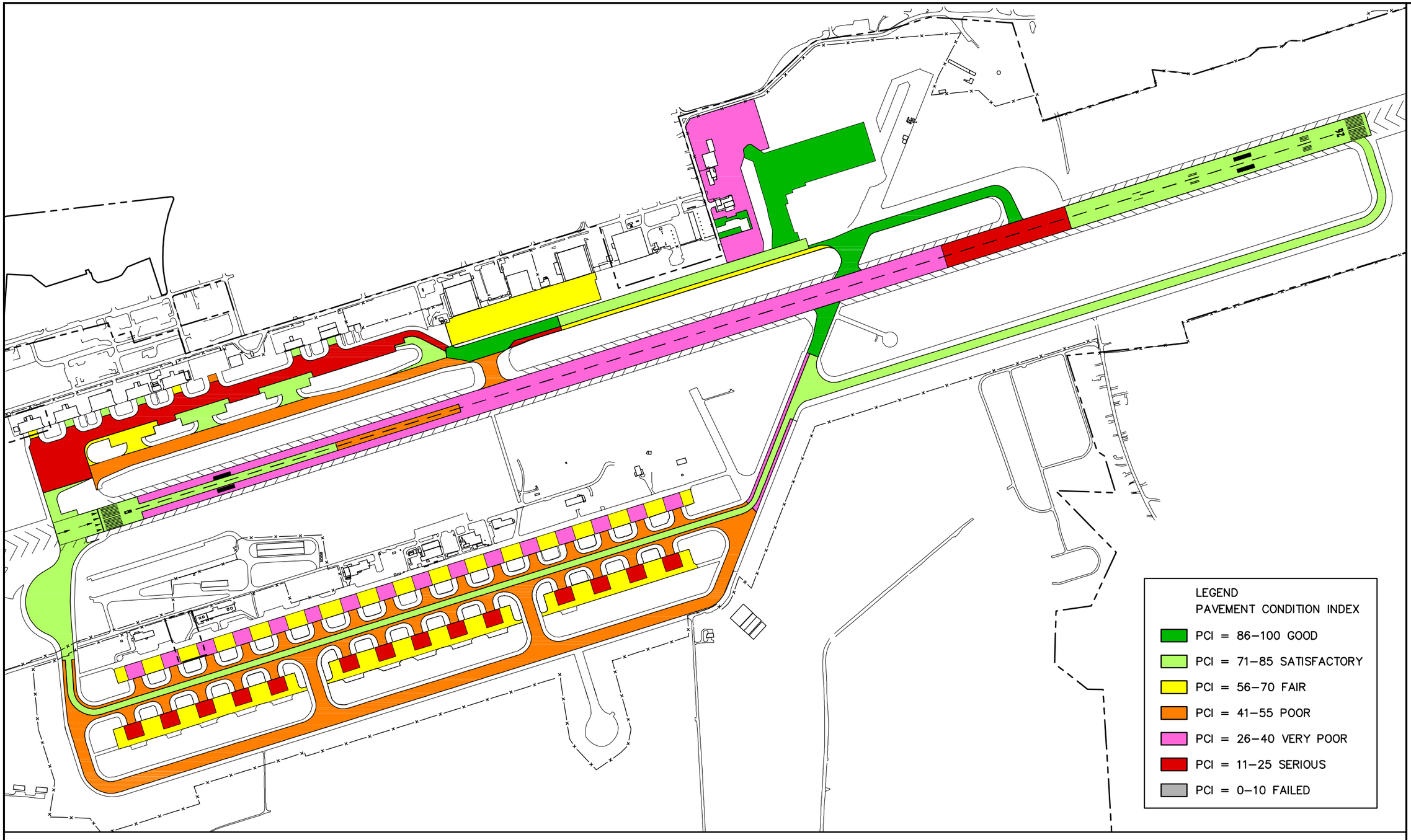


FIGURE
2.1-1

S:\Projects_APPLAN\BQN\Figures\FIG 2.1-1.dwg 06/13/2018 15:21

Table 2.1-1 Runway Length Requirements for Air Carrier Fleet at BQN

Carrier	Aircraft	Load Factor at Runway Length (11,700 feet)	Takeoff Length Required, by % MTOW (feet)				Landing Length Required (feet)	
			70%	80%	90%	100%	Dry Runway	Wet Runway
UAL	B737-900 ER	100%	6,500	6,950	7,400	**7,950**	6,040	6,840
	B737-900 ER w/winglets	100%	7,450	8,050	9,050	**10,500**	6,040	6,840
	B737-800 w/winglets	100%	6,350	6,950	7,600	**8,000**	6,240	7,140
JBU	A320	100%	4,300	4,550	4,950	**5,250**	5,240	6,026
	EMB190	100%	4,450	4,900	5,350	**5,650**	4,540	5,221
	A321-200	100%	4,850	5,150	5,400	**5,750**	6,140	7,061
NKS	A319-100	100%	4,000	4,000	4,200	**4,400**	4,940	5,681
	A320-232	100%	4,100	4,350	4,550	**4,700**	5,240	6,026
	A321-231	100%	4,550	4,850	4,950	**5,450**	6,140	7,061
	A320 NEO	100%	4,150	4,500	4,700	**4,950**	5,340	6,141
FDX	DC1010	100%	6,000	6,400	6,800	**7,400**	6,240	7,176
	MD11	100%	7,300	7,500	8,100	**8,500**	7,940	9,040
	B767-300F	100%	5,900	6,450	7,200	**7,800**	6,890	6,140
GEC	MD11	82%	9,800	**10,800**	LR	LR	7,940	9,040
MPH	MD11	84%	9,300	**10,500**	11,600	LR	7,940	9,040
CLX	B747-400F	89%	9,000	10,000	**11,150**	11,750	7,240	8,240
	B747-800	98%	8,550	9,450	10,250	**11,200**	7,840	8,940

CLX = Cargolux Airlines International; FDX = Federal Express; GEC = Lufthansa Cargo; JBU = Jet Blue Airways; LR = Load-restricted; MPH = Martinair Holland; MTOW = Maximum Take-off Weight; NKS = Spirit Airlines; UAL = United Airlines

Take-off lengths are adjusted to airport elevation, average daily maximum temperature and runway gradient. Red shaded cells indicate that existing runway length at BQN is insufficient for aircraft to operate under specified load or runway conditions.

Source: Kimley-Horn, 2015.

The RPZ includes an Approach RPZ (ARPZ) and a Departure RPZ (DRPZ). The DRPZ typically is located 200 feet from the runway end unless mitigation of non-compatible land uses is necessary. The ARPZ is located 200 feet from the landing threshold and is often larger than the DRPZ depending on approach visibility minimums.

Per FAA design standards at AC 150/5300-13A, Change 1, it is desirable to clear all objects from the RPZ, and therefore, certain land uses within RPZs are prohibited. FAA's 2012 *Interim Guidance on Land Uses within A Runway Protection Zone* indicates that the following land uses (among others) are not compatible if entered into the limits of an RPZ due to an airfield project: buildings and structures; recreational land uses; and public roads/highways.

For proposed construction at FAA obligated airports, mitigation or compensatory actions (e.g., declared distances, roadway/structure relocations, etc.) are typically to achieve land use

compatibility in the RPZ. The Airport Sponsor already possesses restrictive surface/overhead avigation easement to cover the up-to 52 acres of off-airport land in the RPZ.

Runway Safety Areas and Object Free Areas

FAA AC 150/5300-13A (2012) defines the runway safety area (RSA) as a defined surface surrounding a runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot or excursion from a runway. Per FAA standards in AC 150/5300-13A, the RSA must be free of all objects except those that must be located in the RSA because of their function, such as visual aids for aircraft approaches. Public roads, airport service roads, Instrument Landing System localizers, wind cones, and other objects not frangibly-mounted or fixed by function are not allowed within an RSA.

Title 14 CFR Part 139, provides certification requirements for airports with scheduled commercial passenger service. BQN currently holds a Part 139 certificate that allows scheduled and unscheduled commercial service by aircraft having a seating capacity of more than 30 passengers and must comply with the requirements of the certification program. Part 139.309 requires that each certificate holder provide and maintain safety areas for runways and taxiways that meet current FAA airport design standards. FAA Order 5200.8, *Runway Safety Area Program*, establishes procedures to ensure that all RSAs at Part 139 certificated airports conform to the applicable RSA standards, to the extent practicable. An RSA that does not meet standards, to the greatest extent practicable, places the Airport at risk of losing its Part 139 certification.

In addition to the RSA, a Runway Object Free Area (ROFA) is also defined around runways in order to enhance the safety of aircraft operations. The FAA defines the ROFA as an area cleared of all objects except those that are related to NAVAIDs and aircraft ground maneuvering. However, unlike the RSA, there is no physical component to the ROFA. The ROFA is centered about the runway centerline. The ROFA clearing standard requires clearing the ROFA of above-ground objects protruding above the nearest point of the RSA. To the extent practicable, objects in the ROFA should meet the same frangibility requirements as the RSA. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the ROFA.

2.2. REQUESTED FEDERAL ACTION

According to FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, paragraph 201, airport sponsors, not the FAA, own and operate public-use airports in the US and its territories. As a result, airport sponsors are responsible for deciding when and where airport development is needed for building and operating airport facilities. Airport sponsors may seek FAA approvals for changes to their ALP and for Federal Grant funds under the AIP to build airport facilities.

The FAA is responsible for complying with NEPA whenever an Airport Sponsor seeks approval of an ALP or proposed airport projects necessitating an ALP revision; project eligibility for Federal grant-in-aid funds; development of air traffic control and management procedures; and other

actions. FAA's decision making process for airport projects must consider the environmental, social, economic and technical factors of a Proposed Project and those reasonable alternatives that meet the Purpose and Need. The FAA reviewed the Proposed Project, and determined that an EA could be completed to determine and disclose the potential environmental impacts associated with the Proposed Project, and for the agency to fulfill its obligations under FAA Orders 1050.1F and 5050.4B.

The specific Federal actions being requested through this EA are:

- Approval necessary to proceed with the processing of an application for Federal funding for those Proposed Project development items qualifying under the former Airport and Airway Improvement Act of 1982, as amended and re-codified at 49 US Code (U.S.C.) 4701, et seq.
- Unconditional approval[7] of the ALP that depicts the Proposed Project; and
- Modification or cancellation of Terminal Instrument Procedures as necessary for relocated Runway 8-26.

2.3. TIMEFRAME OF THE PROPOSED PROJECT

An approximate 306-workday duration would be required for the conversion of Taxiway M to a temporary runway, a subsequent 457-workday duration for the reconstruction of Runway 8-26, and an approximate subsequent 109-workday duration for the conversion of the temporary runway back to a taxiway. These actions would occur contiguously and would not measurably overlap. Runway reconstruction alternatives considered in **Chapter 3** and further assessed in **Chapter 4** are assumed to require a similar duration of construction activity.

The construction period for environmental analysis would begin sometime in Calendar Year (CY) 2020 and end in CY 2023. Environmental analysis of Proposed Project operational impacts, once the project is fully completed, would be CY 2024, constituting the first full year of operations. For disclosure of potential additional operational impacts due to the Proposed Project, the forecast year 2029 will also be studied in the EA to the extent such study is warranted under the NEPA.

In summary, aside from 2019 baseline conditions, the following study years will be considered in the EA:

- Construction Impacts: CY 2020 through CY 2023;
- Operational Impacts: Build-out operations in CY 2024 and 2029

[7] The FAA's "unconditional approval" of an ALP, or portions thereof, signals that: 1) the proposed ALP features are safe and efficient, 2) the FAA has completed its environmental review, and 3) the FAA has authorized the Airport Sponsor or Project Proponent to proceed with implementing the Proposed Project (FAA Order 5050.4B, 2006). It does not represent a commitment of Federal financial assistance nor even a determination of project feasibility, eligibility or justification.

CHAPTER 3 ALTERNATIVES

This chapter summarizes the screening process used to identify, compare, and evaluate a range of alternatives to the Proposed Project, inclusive of: an overview of the structure of the alternatives screening process and analysis used in this EA; a description of reasonable alternatives to the Proposed Project, including the No-Action Alternative; a concise statement explaining why some alternatives were eliminated from further evaluation in the EA; and identification of reasonable alternatives retained for further evaluation in the EA.

The alternatives analysis was conducted in accordance with the CEQ regulations [40 CFR § 1502.14] and FAA Order 1050.1F which require that Federal agencies perform the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated;
- Devote substantial treatment to each alternative considered in detail, including the Proposed Project, so that reviewers may evaluate their comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency;
- Include the alternative of "No-Action" for a basis of comparison with the other alternatives evaluated;
- Identify the agency's preferred alternative(s); and
- Include appropriate mitigation not already included in the Proposed Project or Alternatives.

3.1. ALTERNATIVES CONSIDERED

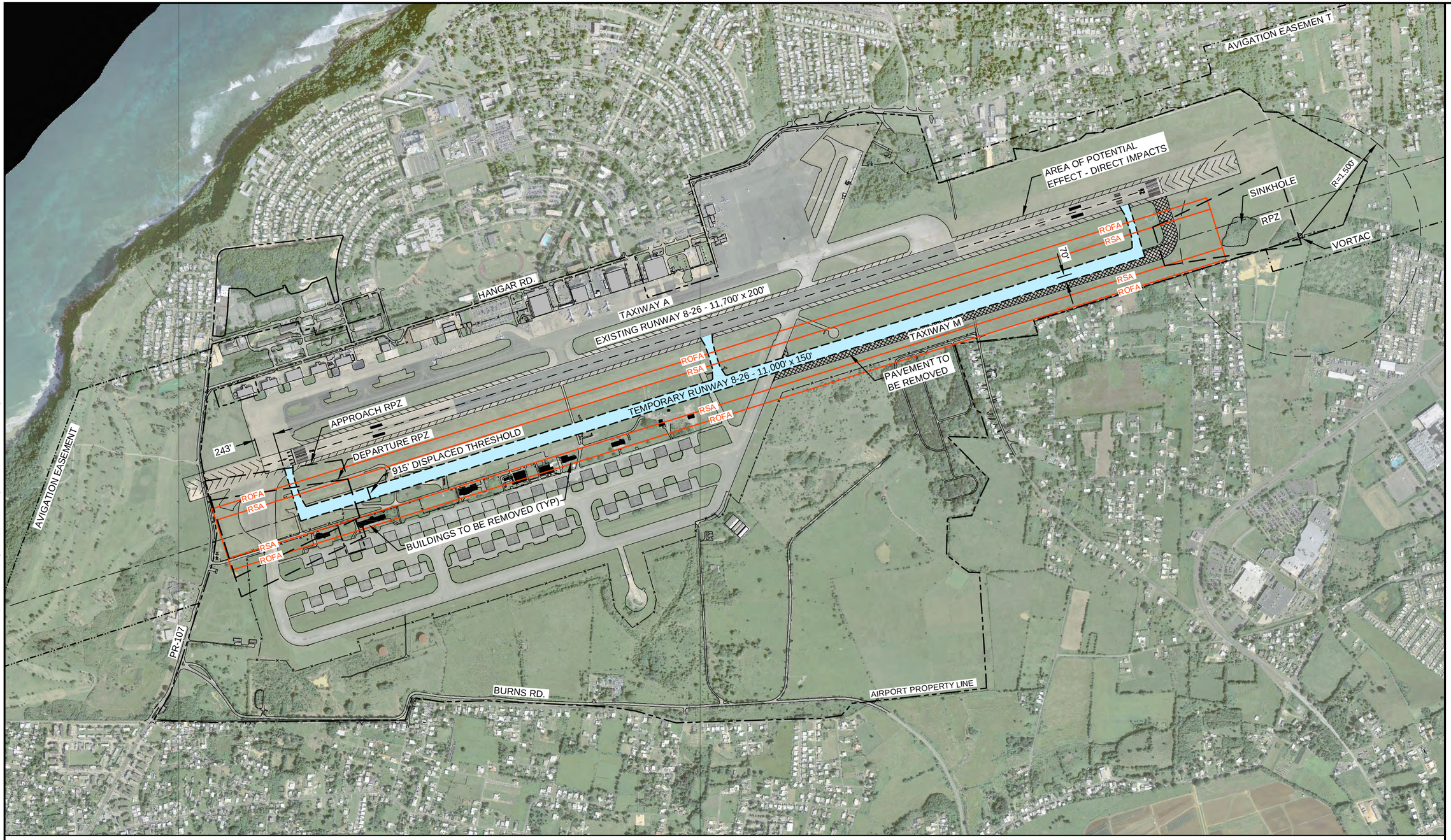
Alternatives for temporary and permanent runway reconstruction considered in this EA are summarized on **Table 3.1-1**.

A screening process has been applied in the EA to the Alternatives on **Table 3.1-1**, such that not all Alternatives considered in the EA will be retained for detailed analysis (see **Section 3.2** for details). The EA also considers a No-Action Alternative pursuant to the NEPA. For the purposes of this EA, the No-Action Alternative briefly examines the environmental consequences that would result if none of the Proposed Action Alternatives are implemented (i.e. no change from the actions and conditions already present at the Airport). The No-Action Alternative serves as a means of comparing the environmental consequences of implementing an Action Alternative to the environmental conditions that would exist if no action is taken (i.e. not implementing or constructing the project).

Table 3.1-1 Alternatives Summary

Alternative	Description
1B	Reconstruct Runway 8-26 in place, 243 feet east of current alignment. Demolish airfield buildings and structures to accommodate ROFA of temporary runway. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 915 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,085 feet TORA on Runway 26, and 10,950 feet Landing Distance Available (LDA) on Runway 8. All RPZ areas would be contained on Airport property (**Figure 3.1-1**).
1C	Reconstruct Runway 8-26 in place, 478 feet east of current alignment. Demolish airfield buildings and structures to accommodate ROFA of temporary runway. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 400 feet on Runway 8, a displaced threshold of 245 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,600 feet TORA on Runway 26, 10,715 feet TORA on Runway 8. Reduce LDA on Runway 8 to 10,715 feet on Runway on Runway 8 and 10,755 on Runway 26. Realign approximately 2,060 lineal feet of Borinquen Avenue (Route 107) to avoid placement in RPZ (**Figure 3.1-2**).
2B	Reconstruct a new Runway 8-26 500 feet south and 862 feet east of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 325 feet on Runway 8, 130 feet on Runway 26, and utilizing declared distances. Reduce usable runway length to 10,698 feet TORA on Runway 26, 10,870 feet LDA on Runway 26, and 10,145 feet LDA on Runway 8. All RPZ areas would be contained on Airport property. RSA and ROFA would partially overlap documented sinkhole (**Figure 3.1-3**).
2C	Reconstruct a new Runway 8-26 500 feet south and 862 feet east of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 325 feet on Runway 8, 130 feet on Runway 26 utilizing declared distances and realigning 2,060 lineal feet of Borinquen Avenue (Route 107). Reduce usable runway length to 10,145 feet LDA on Runway 8 and 10,870 feet LDA on Runway 26. RSA and ROFA would partially overlap documented sinkhole (**Figure 3.1-4**).
2D	Reconstruct a new Runway 8-26 500 feet south and 1,187 feet east of current alignment. Achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1, by applying a displaced threshold of 452 feet on Runway 8, and utilizing declared distances. Reduce usable runway length to 10,148 feet LDA on Runway 8, 10,548 feet LDA on Runway 26, and 10,675 TORA on Runway 8. RSA and ROFA would partially overlap documented sinkhole (**Figure 3.1-5**)
No-Action	For comparative purposes under NEPA, impacts of each project Alternative described above will be assessed against the option of taking no action (i.e., not implementing or constructing the project).

Source: AECOM, 2017.



LEGEND

TEMPORARY PAVEMENT CONSTRUCTION

TO BE REMOVED

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,950'	10,035'
26	10,085'	11,000'	11,000'	11,000'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1B

FIGURE 3.1-1

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RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1C

AVIGATION EASEMEN T
APPROACH / DEPARTURE RPZ
SINKHOLE
R=1,500'
VORTAC
245' DISPLACED THRESHOLD
1,70
ROFA
RSA
HANGAR RD.
TAXIWAY A
EXISTING RUNWAY 8-26 - 11,700' x 200'
TAXIWAY M
TEMPORARY RUNWAY 8-26 - 11,000' x 150'
PAVEMENT TO BE REMOVED
APPROACH RPZ
DEPARTURE RPZ
478'
400' DISPLACED THRESHOLD
AVIGATION EASEMENT
FUTURE RELOCATED PR-107 (2,060 FEET)
BUILDINGS TO BE REMOVED (TYP)
PR-107
BURNS RD.
AIRPORT PROPERTY LINE

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,715'	11,000'	10,715'	10,715'
26	10,600'	11,000'	11,000'	10,755'

N

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GRAPHIC SCALE IN FEET

FIGURE
3.1-2

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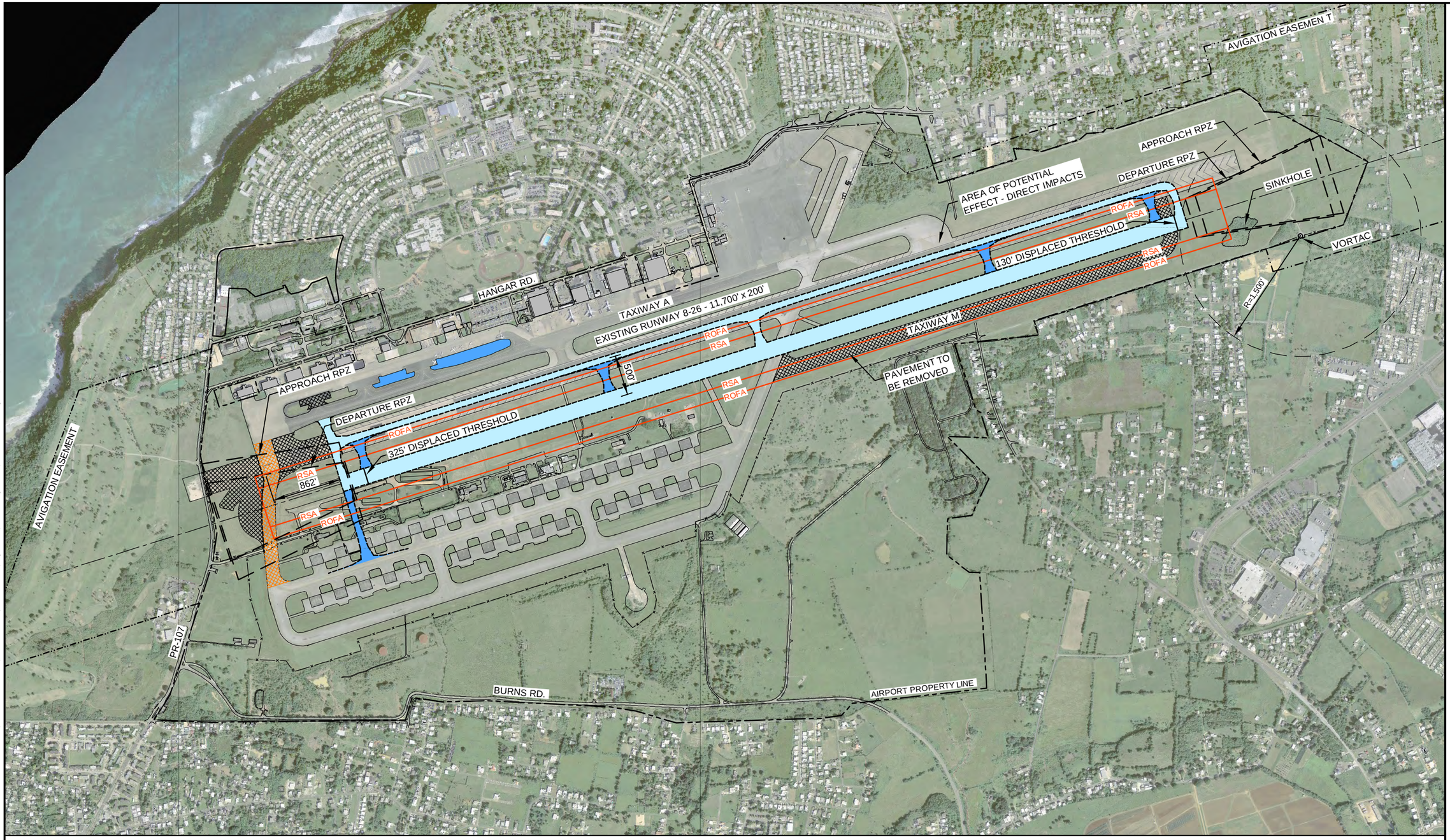

LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	10,698'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B

FIGURE 3.1-3

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RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2C

AVIGATION EASEMEN T
APPROACH RPZ
DEPARTURE RPZ
AREA OF POTENTIAL EFFECT - DIRECT IMPACTS
SINKHOLE
VORTAC
ROFA
RSA
130' DISPLACED THRESHOLD
HANGAR RD.
TAXIWAY A
EXISTING RUNWAY 8-26 - 11,700' x 200'
TAXIWAY M
FUTURE RUNWAY 8-26 - 11,000' x 200'
500'
PAVEMENT TO BE REMOVED
R=1,500'
DEPARTURE RPZ
APPROACH RPZ
325' DISPLACED THRESHOLD
862'
AVIGATION EASEMENT
FUTURE RELOCATED PR-107 (2,060 FEET)
PR-107
BURNS RD.
AIRPORT PROPERTY LINE

LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	11,000'	11,000'	10,470'	10,145'
26	11,000'	11,000'	11,000'	10,870'

N

1000 0 1000

GRAPHIC SCALE IN FEET

FIGURE 3.1-4

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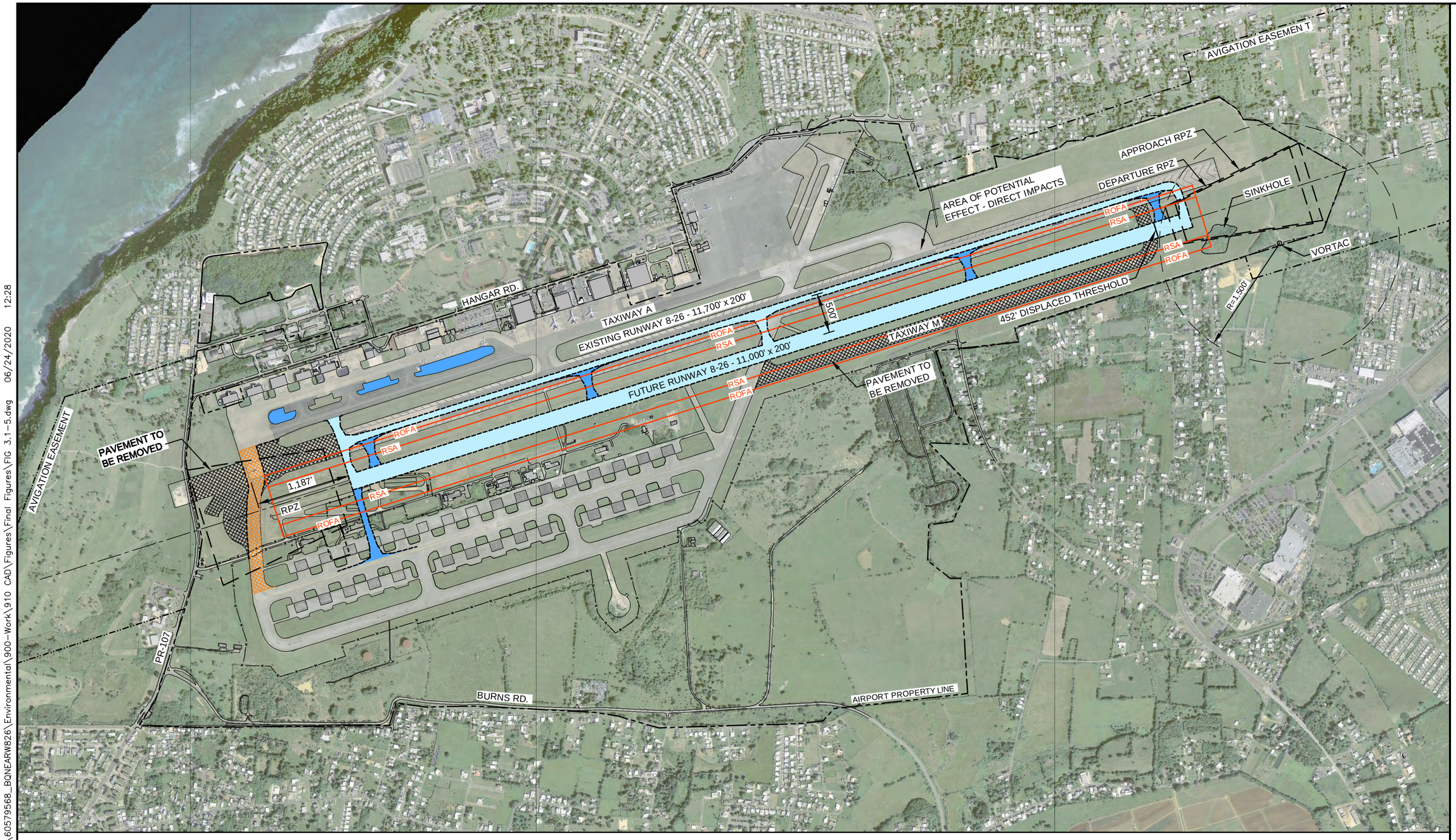


LEGEND

- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- TO BE DEMOLISHED UPON TAXIWAY CONNECTION TO THE SOUTH

DECLARED DISTANCES

RUNWAY	TORA	TODA	ASDA	LDA
8	10,675'	11,000'	10,148'	10,148'
26	11,000'	11,000'	11,000'	10,548'

N

1000 0 1000

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D

FIGURE 3.1-5

S:\Projects\P\Puerto Rico 2018\60579568_BQNEARW826\Environmental\900-Work\910 CAD\Figures\Final Figures\FIG 3.1-5.dwg 06/24/2020 12:28

3.2. ALTERNATIVES SCREENING PROCESS

The alternatives screening process for the reconstruction of Runway 8-26 consists of three levels. A Level 1 evaluation identifies alternatives that would meet the specified purpose of and need for the Proposed Project. Screening Level 2 then evaluates alternatives with respect to operations and constructability in terms of airfield accessibility; development constraints such as the impact of each alternative on future development and operation of the Airport; the need to relocate existing infrastructure; and impacts to existing tenants and surrounding land uses. Finally, Screening Level 3 examines an alternative's potential impact on environmental resources such as streams and floodplains; wetlands; historic and archaeological resources; Department of Transportation (DOT) Section 4(f) resources; and biological resources.

The alternative screening is applied in a stepwise fashion; that is, only alternative(s) meeting the Purpose and Need (i.e., Level 1) are further evaluated in terms of operations and constructability (i.e., Level 2) and, subsequently, potential impact upon key environmental resources (i.e., Level 3).

Alternatives passing all three levels of screening are carried forward for more detailed analysis in the EA, whereas alternatives not passing these screening levels are eliminated from further consideration. As stated previously, the No-Action Alternative is carried forward in the EA regardless of the screening process results.

3.2.1. LEVEL 1 ANALYSIS – PURPOSE AND NEED

The Level 1 analysis assessed each Runway 8-26 reconstruction alternative against the stated Purpose and Need described in **Section 2.1**. Only alternatives which fully satisfied all Purpose and Need criteria were carried forward for Level 2 screening analysis.

3.2.2. LEVEL 2 ANALYSIS – OPERATIONS AND CONSTRUCTABILITY

This level of the alternatives screening analysis was designed to determine which alternatives, of those meeting the Purpose and Need, were considered to be feasible and prudent with respect to project constructability and airport operations. Level 2 criteria specifically addressed the following considerations:

- Accessibility and Operational Considerations: Expanding on the Purpose and Need, this criterion further considers requirements and issues associated with providing sufficient access to each runway both during and following construction. Ease of motor vehicle access on- and off-airport is also considered. Alternatives that represent the most accessible and efficient are considered preferable to others.
- Land Acquisition Requirements: This criterion addresses the need to acquire land for the development of each alternative. Land acquisition comparisons are made for the total amount of land to be acquired and the number of business structures and residential structures to be acquired. Alternatives requiring the least amount of land acquisition are the most prudent in this regard.

- Land Use Compatibility: Land acquired for a given alternative must already be compatible with airport use, must be able to maintain its current use, or can otherwise be rezoned or repurposed to become compatible. Roadway and right-of-way access must also be maintained. An alternative with minimal effect on existing land use is considered more prudent than one with a larger effect.
- Potential Interference with Planned Airport Development: This criterion addresses the potential impact of each alternative to directly conflict with planned development at the Airport or to reduce the efficient future use of Airport lands for aviation-related use. Alternatives that conflict with planned development are considered less preferable, whereas alternatives that foster or facilitate planned development are more preferable.

3.2.3. LEVEL 3 ANALYSIS – ENVIRONMENTAL IMPACTS

Environmental resource categories that have regulatory requirements (i.e., avoidance and minimization of impacts) and those resources that are protected under special purpose environmental laws were evaluated for each alternative passing the Level 2 screening. At the conclusion of the Level 3 analysis, reasonable alternatives were retained for subsequent detailed analysis in this EA. Specific environmental resource areas captured in this screening level comprise:

- Biological Resources: Alternatives were evaluated for the potential to impinge upon documented critical habitats of threatened or endangered plant and animal species, or Essential Fish Habitat. Alternatives that resulted in fewer impacts on biotic resources were considered to be more reasonable and prudent than those with greater impacts.
- DOT Act Section 4(f) Resources: The alternatives screening process evaluated alternatives based on their potential to result in direct or indirect impacts to properties protected under Section 4(f) of the DOT Act [codified at 49 U.S.C. § 303(c)], which provides protection for special properties, including publicly-owned parks, recreation areas, wildlife and waterfowl refuges, or any significant historic sites. Alternatives that would have no direct impacts to Section 4(f) resources were considered to be more practicable than alternatives that resulted in Section 4(f) resource impacts.
- Historic and Archaeological Resources: The alternatives screening process evaluated each alternative on its potential to result in direct impacts to historic and/or archaeological resources listed on, or eligible for listing on, the National Register of Historic Places (NRHP). Alternatives that resulted in fewer impacts to listed resources were considered to be more feasible and practical than those alternatives that resulted in a greater amount of impact(s).
- Noise-Compatible Land Use: The alternatives screening process evaluated alternatives as applicable for changes in the location and extent of the day-night average sound level (DNL) contours at both 65 and 60 decibels (DNL 65 dB and DNL 60 dB) respectively. Areas experiencing a 1.5 dB increase in noise within the DNL 65 dB were identified and considered for potential impacts to land use compatibility. For instances where off-airport land uses were exposed to this potential increase, 3.0 dB increases in noise within the DNL 60 dB contours were further evaluated.
- Wetlands and Water Resources: Alternatives were evaluated based on the approximate

acreage of wetlands impacted and the potential for implications on existing stormwater management and/or surface water quality. Alternatives with few impacts were considered more prudent and feasible than those generating greater impacts.

3.3. ALTERNATIVES SCREENING RESULTS

The results of the alternatives screening process described in previous sections are summarized on **Table 3.3-1** and discussed in the following sections. As previously mentioned, because Alternatives 1A and 2A are conceptual in nature and are only meant to depict the general layout of both the temporary and permanent reconstruction concepts considered for this EA, they are not evaluated in further detail in this section.

3.3.1. PURPOSE AND NEED

Criterion #1: Provide air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN

With the exception of a No-Action Alternative, all improvement alternatives presented in this EA would accommodate the needed reconstruction and/or rehabilitation of Runway 8-26 pavements. Construction activities necessary for each runway alternative support a construction phasing approach that would preserve operational capability at BQN during the construction period.

Criterion #2: Maintain adequate runway length for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and reconstruction

As previously stated in **Section 2.1.2**, payload restrictions would begin to occur for domestic passenger aircraft at a length of 9,050 feet TORA, and that at this length long-range international cargo aircraft would operate with load factors between 64% and 74%, which is considered to be unprofitable to cargo operators. Cargo operators that would experience this level of payload restriction have indicated that a minimum 10,500 feet of useable runway take-off length is required; else these operators may elect to use an alternative airport. Therefore, for the purposes of alternatives screening, an alternative does not meet the Purpose and Need of the Proposed Project if it causes passenger aircraft to experience payload restrictions, and/or if it causes cargo aircraft to operate at less than 80% payload capacity on a runway significantly shorter than 10,500 feet (+/-).

Table 3.3-2 summarizes the declared distances by alternative and runway end, which are also depicted on **Figures 3.1-1** through **3.1-5**. These declared distances were compared against runway length requirements for the existing and future fleet presented in **Section 2.1.2,** in order to determine if a given alternative provides adequate runway length to serve the fleet operating at BQN, and whether or not aircraft would need to incur operational penalties (load factor reductions) in order to remain operational. See **Appendix A** for details on the runway length analysis and operational penalties summarized on **Table 3.3-1**.

Table 3.3-1 Alternatives Screening Summary

Screening Level	Criteria	Result					
		Alt 1B	**Alt 1C**	**Alt 2B**	**Alt 2C**	**Alt 2D**	**No-Action**
Level 1 – Purpose and Need	Provide air carrier runway of sufficient pavement strength and condition to accommodate existing and future operations at BQN?	Yes	Yes	Yes	Yes	Yes	No
	Maintain adequate runway length for the existing and future aircraft fleet mix using BQN during pavement rehabilitation and reconstruction?	Passenger aircraft B737-900 would experience ***temporary*** reduction in load factor due to reductions in available runway length (down to 90% of maximum load) Majority of long-range international cargo aircraft would experience ***temporary*** reductions in load factor due to reductions in available runway length: MD-11 and B747-400 reduced to 70%; B747-800 reduced to 80%. 10,085 feet TORA on Runway 8 does not meet minimum requirement specified by air carriers (**Appendix A**)	Long-range international cargo aircraft would experience ***temporary*** reductions in load factor due to reductions in available runway length: MD-11 reduced to between 70%-80% of maximum load; B747-400 reduced to 80% B747-800 reduced to 90% (**Appendix A**)	Long-range international cargo aircraft would experience ***permanent*** reductions in load factor due to reductions in available runway length: Some MD-11 and B747-400 reduced to 70%; B747-800 reduced to 90% (**Appendix A**)	Long-range international cargo aircraft would experience ***permanent*** reductions in load factor due to reductions in available runway length: B747-400 reduced to 80%; B747-800 reduced to 90% (**Appendix A**)	Long-range international cargo aircraft would experience ***permanent*** reductions in load factor due to reductions in available runway length: B747-400 reduced to 80%; B747-800 reduced to 90%, some MD11 operations reduced to 70% (**Appendix A**)	No operational penalties would occur because runway length would not be reduced
	Achieve all FAA Design and Safety Standards at the End-State of Construction	Once the existing Runway 8-26 is rehabilitated, off-airport land uses would not be compatible with RPZ guidelines established for new construction.	Once the existing Runway 8-26 is rehabilitated, off-airport land uses would not be compatible with RPZ guidelines established for new construction.	By applying declared distances and threshold displacement, the alternative achieves all requisite design and safety standards.	By applying declared distances and threshold displacement, the alternative achieves all requisite design and safety standards.	By applying declared distances and threshold displacement, the alternative achieves all requisite design and safety standards.	No change from existing conditions would occur.
Proceed to Level 2 Screening?		**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Level 2 – Operations and Constructability	Accessibility and Operational Considerations	--	--	Provides 200-foot runway width, and required runway-to-taxiway separation necessary to eliminate MOS for operations of Cargolux Airlines B747 aircraft	Provides 200-foot runway width, and required runway-to-taxiway separation necessary to eliminate MOS for operations of Cargolux Airlines B747 aircraft	Provides 200-foot runway width, and required runway-to-taxiway separation necessary to eliminate MOS for operations of Cargolux Airlines B747 aircraft	None
	Land Acquisition Requirements	--	--	None	None	None	None

Screening Level	Criteria	Result					
		Alt 1B	**Alt 1C**	**Alt 2B**	**Alt 2C**	**Alt 2D**	**No-Action**
	Land Use Compatibility	--	--	No physical land use compatibility issues are present. See Level 3 screening for Noise-related land use compatibility.	Route 107 and Punta Borinquen Golf Course are located in proposed Runway 8 RPZs. A combination of existing restrictive avigation easement and roadway relocation would be required.	No physical land use compatibility issues are present. See Level 3 screening for Noise-related land use compatibility.	Existing off-airport land use incompatibility in RPZ would remain
	Potential Interference with Planned Airport Development	--	--	None	None	None	None
Proceed to Level 3 Screening?		--	**--**	**Yes**	**No**	**Yes**	**Yes**
Level 3 – Potential Environmental impacts	Biological Resources	--	--	Permanent land cover conversions, and RSA grading activities to the east of the proposed runway may affect, but are not likely to adversely affect, available habitat for the federally-endangered Puerto Rican Boa and the federally-threatened Roseate Tern.	--	Permanent land cover conversions, and RSA grading activities to the east of the proposed runway may affect, but are not likely to adversely affect, available habitat for the federally-endangered Puerto Rican Boa and the federally-threatened Roseate Tern.	No change
	DOT Section 4(f) Resources	--	--	16 buildings to be demolished are NRHP eligible historic resources protected under Section 4(f). The exiting Runway 8-16 itself is also eligible for listing to the NRHP and protected by Section 4(f).	--	16 buildings to be demolished are NRHP eligible historic resources protected under Section 4(f). The exiting Runway 8-16 itself is also eligible for listing to the NRHP and protected by Section 4(f).	No change
	Historic and Archaeological Resources	--	--	Structures to the south of the proposed runway would be demolished and are potentially eligible for listing to the NRHP.	--	Structures to the south of the proposed runway would be demolished and are potentially eligible for listing to the NRHP.	No change
	Noise-Compatible Land Use	--	--	5 residences would be newly contained within the airport's DNL 65 dB noise contour and would require mitigation. 64 residences and one church would be newly contained within the DNL 60 dB noise contour.	--	5 residences would be newly contained within the airport's DNL 65 dB noise contour and would require mitigation. 64 residences and one church would be newly contained within the DNL 60 dB noise contour.	No change
	Wetlands and Water Resources	--	--	No jurisdictional wetlands or Waters of the US would be affected by this Alternative.	--	No jurisdictional wetlands or Waters of the US would be affected by this Alternative.	No change
Carried Forward for Detailed Analysis in EA?		**No**	**No**	**Yes**	**No**	**Yes**	**Yes**

Green-shaded cells indicate the alternative is carried forward to subsequent screening levels (or ultimately detailed analysis in the EA). Red-shaded cells indicate that the alternative did not pass the indicated screening level and is not considered for further screening/analysis. For discounted alternatives, the factors which led to their dismissal are also shaded in red.
Source: AECOM, 2017

Only Alternative 1B falls short of providing the requisite runway length. All other alternatives would meet the minimum requirement, but would impose payload restrictions for long-range air cargo aircraft, with the least restrictions occurring with Alternative 2C and 2D

Table 3.3-2 Declared Distances by Alternative and Runway End

Alternative	TORA (feet)		TODA (feet)		ASDA (feet)		LDA (feet)	
	Runway 08	Runway 26	Runway 08	Runway 26	Runway 08	Runway 26	Runway 08	Runway 26
1B	11,000	10,085	11,000	11,000	10,950	11,000	10,035	11,000
1C	10,715	10.600	11,000	11,000	10,715	11,000	10,715	10,756
2B	11,000	10,698	11,000	11,000	10,470	11,000	10,145	10,870
2C	11,000	11,000	11,000	11,000	10,470	11,000	10,145	10,870
2D	10,675	11,000	11,000	11,000	10,148	11,000	10,148	10,548

ASDA = Accelerate-Stop Distance Available; TODA = Take-off Distance Available; TORA = Take-off Run Available
Source: AECOM, 2018.

Criterion #3: Achieve Full Compliance with FAA Design and Safety Standards

Alternatives 1B and 1C are able to achieve RPZ compliance with a combination of runway threshold shifts, declared distances, displaced thresholds, and in the case of Alternative 1C, roadway realignment, so the temporary Runway 8-26 is considered in full compliance with standards. However, at the end state of these Alternatives, when operations are restored to the existing reconstructed Runway 8-26, all existing RPZ non-compliance issues would remain in effect. The reconstructed Runway 8-26 at the end state of these alternatives is considered new construction. For new construction, FAA must ensure that all applicable design and safety standards are fully adhered to, and has determined for BQN that existing easements and the potential application of MOS are not allowable. Therefore, Alternatives 1B and 1C are dismissed from further consideration in this EA.

Comparatively, for the permanent Runway 8-26 Alternatives 2B and 2D, full compliance with design and safety standards can be achieved. However, as shown on **Figures 3.3-1** and **3.3-2** buildings 1251, 1245, 3, 1104, 1132, 6, 1071, 1089, 1029, 1031, 1072 are all contained within the primary surface and/or approach surface of the new runway and cannot remain. The remainder of the southern campus buildings are located in the 7:1 transitional surface of the runway and would be considered obstructions to navigable airspace. Also shown on the figures, the majority of these buildings penetrate the 7:1 surface by a significant amount, with the only exceptions being buildings 9, 15 and 1073. Preliminary airspace analysis has determined that all of these buildings cannot persist in the transitional surface without compromising the operational capabilities of arriving and departing aircraft. Therefore, the FAA has determined that all buildings shown on **Figures 3.3.1** and **3.3-2** must be demolished as part of Alternatives 2B and 2D in order to achieve compliance with Part 77 regulations.

3.3.2. OPERATIONS AND CONSTRUCTABILITY

Below is a synopsis of the Level 2 Operations and Constructability evaluation for alternatives meeting the Purpose and Need and passing Level 1 screening (i.e., Alternatives 2B, 2C and 2D).

- Accessibility and Operational Considerations: Alternatives 2B and 2D meet FAA runway separation requirements, and therefore, provide regular unrestricted use of larger ADG VI aircraft. The existing MOS would no longer be required.

- Land Acquisition Requirements: Neither Alternative 2B nor Alternative 2D require land acquisition to achieve land use compatibility in RPZs.

- Land Use Compatibility: With Alternative 2C, a portion of Route 107 would be relocated around the DRPZ and existing restrictive easement would be applied to control land uses in the portion of the DRPZ that extends off Airport property. The ARPZ would be shifted entirely onto Airport property using a 1,152-foot displaced threshold and declared distances. This is not the case with Alternatives 2B and 2D.

- Potential Interference with Planned Airport Development: None of the retained Alternatives impede or eliminate the ability of the PRPA to execute long-range development plans for passenger terminal building, terminal aprons and cargo facilities planned in the southwest quadrant of BQN, all of which are immediately adjacent to the Proposed Project and Alternatives. Alternatives 2B, 2C and 2D each afford major new development on the eastern end of the newly converted parallel taxiway, and allow for future apron expansion with taxilane in the northwest apron areas.

3.3.3. POTENTIAL ENVIRONMENTAL IMPACT

As described in **Section 3.3.1**, only Alternatives 2B and 2D passed Level 2 alternatives screening and were carried forward for Level 3 screening analysis. Below is a synopsis of the Level 3 screening results.

- Biological Resources: According to an Official Species List obtained from the US Fish and Wildlife Service (USFWS), land cover conversions (and building removals in the case of Alternative 1A) could potentially affect suitable habitat for the federally-endangered Puerto Rican Boa and the federally-threatened Roseate Tern. Potential impacts associated with Alternative 1A would be temporary as opposed to permanent impacts potentially incurred with the remaining retained alternatives. The USFWS has concurred that there would be no significant impacts to these species[8]. The USFWS has further concluded in a letter dated July 31, 2018 that the Proposed Project would not result in effects to listed species or designated critical habitat, and therefore a consultation pursuant to Section 7 of the Endangered Species Act is not required (see **Appendix C.2**).

- DOT Act Section 4(f) Resources: Both retained alternatives require the demolition of 21

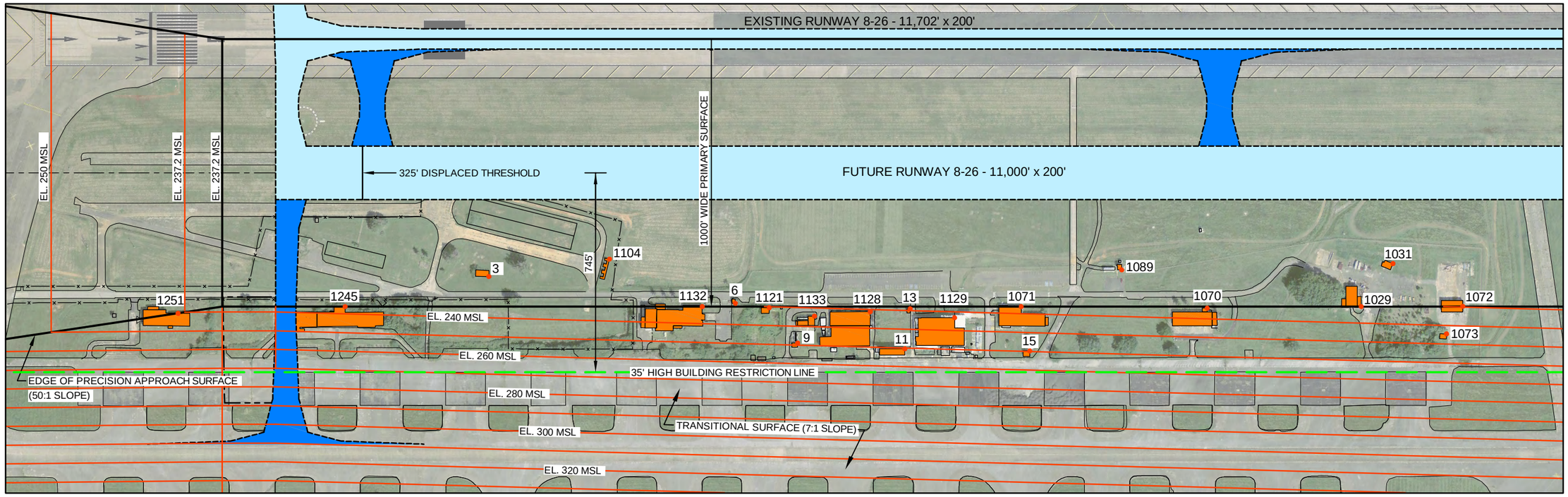
[8] Rafael Hernández International Airport Wildlife Hazard Assessment November 1, 2013

structures south of the proposed Runway 8-26 reconstruction location to comply with 14 CFR 77.17(a)(5), which prevents the persistence or placement of objects within the surface of a takeoff and/or landing area of an airport, or within any imaginary surface (including, primary, horizontal, conical, approach or transitional surfaces). Sixteen of these structures were constructed as part of the former Ramey Air Force Base (the current site of BQN). Similarly, the existing Runway 8-26 is largely comprised of pavements that were emplaced when BQN was in use as either Borinquen Field (World War II era) or Ramey Air Force Base (Cold War era). Reconfiguring the runway to a taxiway would alter the function of the structure, and rehabilitation/reconstruction of failed sections would remove the original pavements. During National Historic Preservation Act (NHPA) Section 106 consultation, the Puerto Rico State Historic Preservation Office (PRSHPO) indicated that BQN, as the former site of Ramey Air Force base is a historic district that is eligible to the NRHP, and that all structures constructed prior to base closure individually contribute to the historic district. As historically significant structures, the existing runway and 16 of the 21 buildings to be demolished are considered Section 4(f) resources and the Proposed Project would result in their physical use.

- Historic and Archaeological Resources: The closest off-airport historic architectural resource to the Proposed Project and Alternatives is the Fora di Punta Borinquen (Borinquen Lighthouse) approximately 0.6 mile northwest of the existing runway. The resource is eligible for listing to the NRHP. However, no direct impacts to this resource would occur and noise analysis indicates that no indirect noise impacts would occur either. As described above, 16 buildings to be demolished with Alternatives 2B and 2D due to placement in the ROFA, as well as the existing Runway 8-26 are eligible for listing to the NRHP based on their association with the former Ramey Air Force Base. Accordingly, PRSHPO has recommended a finding that the Proposed Project would result in adverse effects to these historic properties.

- Noise-Compatible Land Use: With Alternatives 2B and 2D, five residences experience a permanent 1.5 dB increase in noise which would result in them being newly contained in the DNL 65 dB noise contour. An additional 64 residences and one church would experience a 3.0 dB increase in noise resulting in them being newly contained within the DNL 60 dB noise contour. Both Alternatives 2B and 2D would require the purchase of avigation easements for noise-affected properties.

- Wetlands and Water Resources: The retained alternatives have the potential to impact a suspected riverine wetland to the south of existing Taxiway M that is documented in the National Wetland Inventory. Environmental evaluation has determined that the subject area is not a wetland, and a conclusion has been obtained from the US Army Corps of Engineers (USACE) in a letter dated on September 18, 2018, which indicates it is not jurisdictional (see **Appendix C.3**).



PLAN VIEW

OBSTRUCTION DATA TABLE

NO.	DESCRIPTION	LATITUDE	LONGITUDE	GROUND ELEVATION FEET (MSL)	BUILDING HEIGHT (FEET)	BUILDING ELEVATION FEET (MSL)	LOWEST AFFECTED FAR PART 77 SURFACE	SURFACE ELEVATION FEET (MSL)	PENETRATION (FEET)
1251	BUILDING	N 18°29'15.74"	W 067°08'35.79"	245	15	260	RUNWAY 8 APPROACH	240.5	19.5
1245	BUILDING	N 18°29'17.84"	W 067°08'29.67"	238	12	250	PRIMARY	236.2	13.8
3	BUILDING	N 18°29'20.52"	W 067°08'24.70"	242	12	254	PRIMARY	234.1	19.9
1104	BUILDING	N 18°29'22.49"	W 067°08'20.43"	240	12	252	PRIMARY	232.3	19.7
1132	BUILDING	N 18°29'21.85"	W 067°08'16.44"	233	25	258	PRIMARY	230.9	27.1
6	BUILDING	N 18°29'22.33"	W 067°08'15.25"	231	15	246	PRIMARY	230.4	15.6
1121	BUILDING	N 18°29'22.56"	W 067°08'13.94"	231	15	246	7:1 TRANSITIONAL	230.5	15.5
1133	BUILDING	N 18°29'22.77"	W 067°08'12.16"	234	20	254	7:1 TRANSITIONAL	234.3	19.7
9	BUILDING	N 18°29'21.63"	W 067°08'12.47"	234	15	249	7:1 TRANSITIONAL	249.0	0.0
1128	BUILDING	N 18°29'23.55"	W 067°08'10.15"	231	30	261	7:1 TRANSITIONAL	231.2	29.8
11	BUILDING	N 18°29'22.63"	W 067°08'08.43"	232	25	257	7:1 TRANSITIONAL	250.4	6.6
13	BUILDING	N 18°29'24.10"	W 067°08'08.71"	232	15	247	7:1 TRANSITIONAL	229.0	18.0
1129	BUILDING	N 18°29'24.29"	W 067°08'06.95"	232	30	262	7:1 TRANSITIONAL	233.1	28.9
15	BUILDING	N 18°29'23.95"	W 067°08'03.78"	231	12	243	7:1 TRANSITIONAL	249.8	-6.8
1071	BUILDING	N 18°29'25.42"	W 067°08'04.61"	231	15	246	PRIMARY	226.2	19.8
1089	BUILDING	N 18°29'27.85"	W 067°08'01.32"	230	25	255	PRIMARY	224.7	30.3
1070	BUILDING	N 18°29'27.46"	W 067°07'57.70"	228	15	243	7:1 TRANSITIONAL	224.3	18.7
1029	BUILDING	N 18°29'29.24"	W 067°07'52.02"	223	30	253	PRIMARY	221.2	31.8
1031	BUILDING	N 18°29'31.11"	W 067°07'51.34"	226	15	241	PRIMARY	220.7	20.3
1072	BUILDING	N 18°29'30.38"	W 067°07'48.25"	225	20	245	PRIMARY	219.7	25.3
1073	BUILDING	N 18°29'29.23"	W 067°07'48.53"	223	12	235	7:1 TRANSITIONAL	234.5	0.5

LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- AFFECTED BUILDINGS
- 240 MSL — 7:1 TRANSITIONAL SURFACE CONTOUR
- BUILDING RESTRICTION LINE
- 1251 — OBSTRUCTION POINT LOCATION

N

400 0 400

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2B
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 3.3-1

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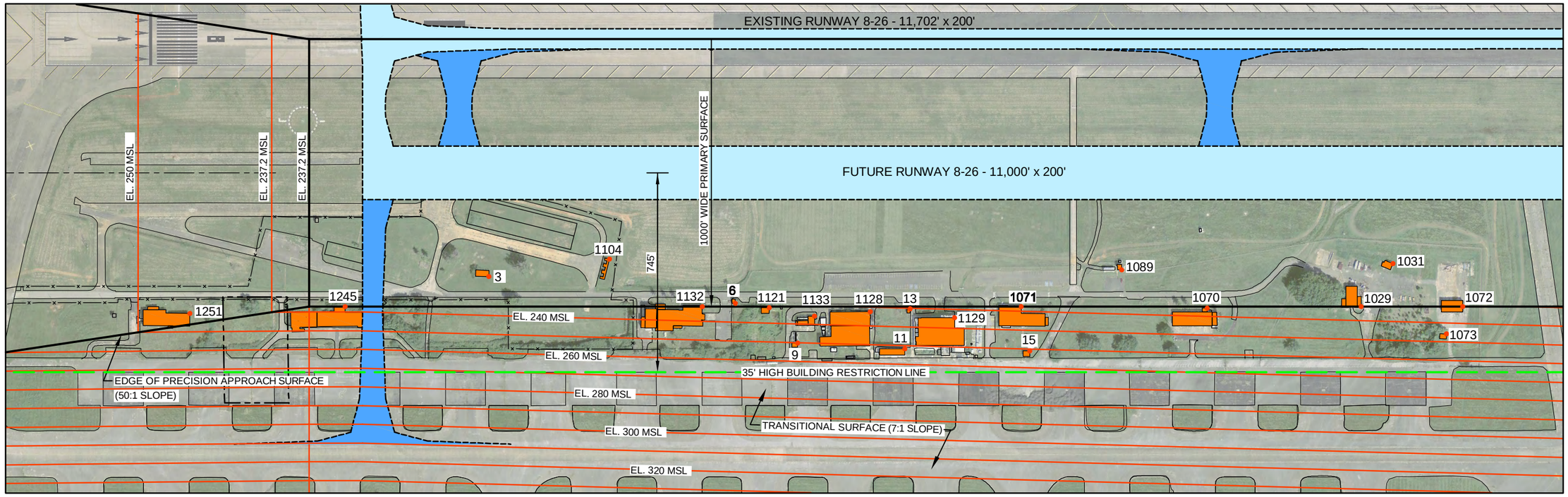

PLAN VIEW

OBSTRUCTION DATA TABLE

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LEGEND
- INITIAL PAVEMENT CONSTRUCTION
- FUTURE TAXIWAY CONNECTIONS (ONCE JUSTIFIED)
- AFFECTED BUILDINGS
- 240 MSL — 7:1 TRANSITIONAL SURFACE CONTOUR
- BUILDING RESTRICTION LINE
- 1251 — OBSTRUCTION POINT LOCATION

N

400 0 400

GRAPHIC SCALE IN FEET

RAFAEL HERNANDEZ AIRPORT
Aguadilla, Puerto Rico
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2D
(BUILDINGS WITHIN PROPOSED IMAGINARY SURFACES)

FIGURE 3.3-2

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3.3.4. IDENTIFICATION OF PREFERRED ALTERNATIVE

Based on the conclusions of the environmental analysis contained herein, and after the Draft EA was made available for public and agency review, the PRPA has identified Alternative 2B as the preferred alternative for implementation.

CHAPTER 4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1. INTRODUCTION

This chapter provides a description of the relevant baseline human, physical, and natural environment that may be affected by the Proposed Project and its alternatives as well as the environmental impacts of the alternatives retained for detailed evaluation. The amount of information on each resource is based on the extent of potential impact and is commensurate with the impact's relevance to the Proposed Project.

4.1.1. STUDY AREAS

A Direct Study Area (DSA) was delineated within which direct physical impacts of the Proposed Project alternatives (i.e., construction footprint) have been characterized and disclosed. To account for indirect ground disturbance activities that may occur during construction, such as materials and equipment staging, the DSA includes a 100-foot buffer. The DSA also coincides with the proposed archaeological resources Area of Potential Effect (APE) for the Proposed Project, which will be used for the purposes of Section 106 coordination pursuant to the NHPA, respectively.

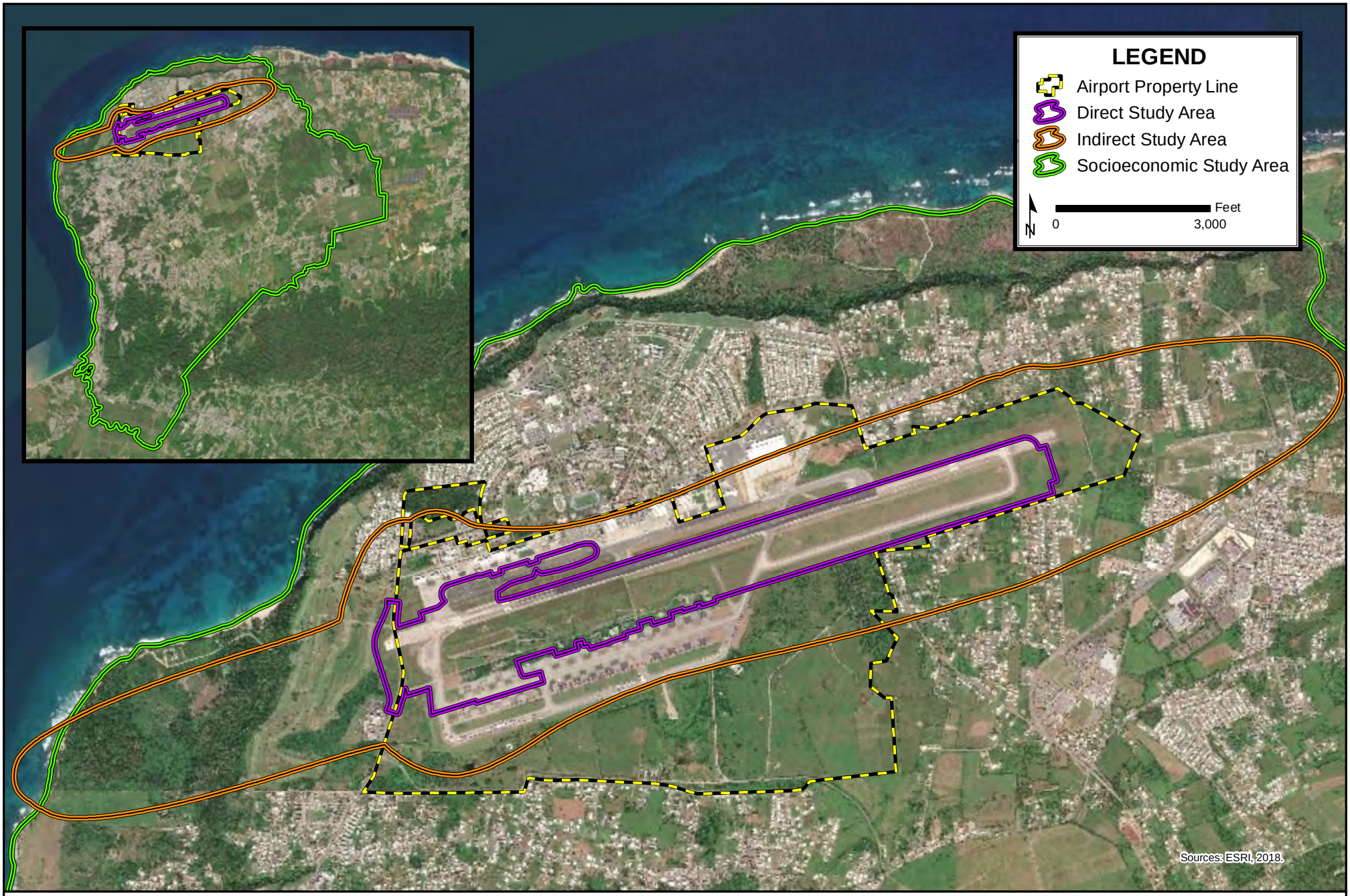
An Indirect Study Area (ISA) was also delineated to assess potential secondary impacts not related to the construction footprint of the Proposed Project alternatives, and corresponds to the area within the composite DNL 60 dB of the Proposed Project and retained alternatives. The ISA also serves as the historic resources APE and will also be used to identify, disclose and evaluate potential impacts on eligible historic architectural resources protected by the NHPA, DOT Section 4(f) resources and other potentially incompatible land uses.

Finally, a Socioeconomic Study Area (SSA) was established to broadly characterize conditions of relevance within the Airport vicinity, relating to socioeconomic and environmental justice conditions that would be relevant to evaluation of the Proposed Project. The SSA is comprised of the municipality of Aguadilla.

Refer to **Figure 4.1-1** for a graphical depiction of the study areas delineated for the EA.

4.1.1.1. Environmental Resource Evaluation

NEPA establishes a broad national policy to protect and enhance the human environment. NEPA and its implementing regulations require that Federal agencies such as the FAA demonstrate compliance with its provisions prior to approving, funding or otherwise supporting actions with a potential deleterious effect upon the human environment.



RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

STUDY AREAS

FIGURE
4.1-1

Path: C:\Users\tia.norman\Desktop\BQN GIS\mxd\Figure 4-1-1 Study Areas_rev1.mxd, Date Saved: 7/9/2020 1:41:49 PM

With respect to airport improvement projects such as those proposed, the FAA must demonstrate that the project(s) underwent the appropriate NEPA review and secured environmental approval before the project(s) can be implemented.

FAA implements NEPA using FAA Order 1050.1F. The Order guides FAA officials on demonstrating compliance of FAA actions with NEPA, as well as determining the required scope of environmental review and associated documentation (i.e., an EIS, an EA, or a Categorical Exclusion). Order 1050.1F is supplemented as necessary with Order 5050.4.

Order 1050.1F calls for the analysis of the environmental resource categories identified below.

- Air Quality
- Biological Resources (including fish, wildlife, and plants)
- Climate
- Coastal Resources
- DOT Section 4(f) Resources
- Farmlands
- Hazardous Materials, Pollution Prevention and Solid Waste
- 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 Health and Safety Risks
- Visual Effects (including light emissions)
- Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)

All of the environmental resource categories listed above were considered for applicability in defining/establishing the affected environment outlined in this Chapter, as well as evaluating the potential environmental consequences of the Proposed Project. **Table 4.1-1** summarizes the boundaries of study for each of these categories, in the context of the EA study areas described in **Section 4.1.1**. As indicated on **Table 4.1-1**, the following resources were determined either not present or not measurably impacted by the Proposed Project:

- Biological Resources: Based on the Puerto Rico Department of Natural and Environmental Resources' (DNER) Natural Heritage program data bank, there are no sightings or records of protected species of plants or animals in the DSA. During initial scoping, DNER stated that the department has determined that because the Proposed Project would be constructed in a developed footprint, no significant impacts on natural and environmental resources under its jurisdiction are expected, and the department has no objections to the Proposed Project. With the implementation of the Proposed Project, the flight tracks would not shift over any new habitat potentially suitable for listed species. In addition, the Proposed Project will not induce additional aircraft operations. On July 31, 2018, the USFWS determined that based on the information received, the nature of the project and site characteristics, the Proposed Project would not result in effects to listed species or

designated critical habitat and no further consultation pursuant to Section 7 of the Endangered Species Act is required. **Appendix B** provides the Flora and Fauna Survey report prepared by ReForesta as part of this EA. **Appendix C.2** provides the USFWS determination stamped on the letter they received from FAA.

- Farmlands: In accordance with the Farmland Protection Policy Act, the Natural Resources Conservation Service (NRCS) of the US Department of Agriculture uses soil survey information to identify the extent to which soils are classified as Prime, Unique, or Statewide/Locally Important farmland. Based on current analysis of the NRCS soils data, no "prime farmland" and/or "farmlands of statewide/unique importance" are located in the DSA.

- Visual Effects (including light emissions): Substantial changes in the viewshed compared to existing conditions would not occur with the Proposed Project. Light Emissions and Visual Effects will not be evaluated in detail within the EA.

- Wetlands: Based on a May 2018 site visit, there are no federally jurisdictional wetlands present within or adjacent to the DSA. The USACE has concurred with this determination (**Appendix C.3**)

- Floodplains: During initial scoping for this EA, Puerto Rico Planning Board (PRPB) confirmed that the Proposed Project would occur in an area outside of the limits of any flood zones.

- Wild and Scenic Rivers: Established pursuant to the Wild and Scenic Rivers Act, the National Wild and Scenic Rivers System (NWSRS) is an inventory of rivers having outstanding natural, cultural or recreational values, jointly administered by the Bureau of Land Management, National Park Service, USFWS and the US Forestry Service. NWSRS rivers are afforded full protection under the Wild and Scenic Rivers Act, or have been identified by Congress as "study rivers" potentially eligible for protection under the Act. Additionally, the Nationwide Rivers Inventory catalogs rivers with the minimum eligibility requirements of the Act and are afforded some protections under the Act pending detailed study.

  Puerto Rico has three rivers listed to the NWSRS: Rio de la Mina, Rio Iacos, and Rio Mameyes, all located in El Yunque National Forest. None of the rivers listed to the NWSRS is located within 90 miles of BQN. Due to the distance of these resources from BQN, no further evaluation in this EA is warranted.

Table 4.1-1 Environmental Resources Evaluated

Category	Study Boundaries (Fig. 4.1-1)			
	APE	DSA	ISA	SSA
Air Quality		x	x	
Biological Resources (including fish, wildlife and plants)				
Climate		x	x	
Coastal Resources		x	x	x
DOT Section 4(f)		x	x	
Farmlands				
Hazardous Materials, Pollution Prevention, and Solid Waste		x		
Historical, Architectural, Archaeological, and Cultural Resources	x	x		
Natural Resources and Energy Supply		x		
Noise and Noise Compatible Land Use	x	x	x	
Socioeconomics, Environmental Justice, Children's Health and Safety Risks				x
Visual Effects (including light emissions)				
Wetlands				
Floodplains		x		
Surface/ Groundwater Resources		x		
Wild and Scenic Rivers				

Notes:
APE = Area of Potential Effect (APE for archeological resources coincides with DSA, APE for historic and DOT Section 4(f) resources coincides with ISA);
DSA = Direct Study Area (Area of direct physical impacts of the Proposed Project alternatives/construction footprint, plus 100-foot buffer);
ISA = Indirect Study Area (Area of secondary impacts, within the composite DNL 60 dB of the Proposed Project and retained alternatives);
SSA = Socioeconomic Study Area (Entirety of Aguadilla Municipality).
Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

4.1.2. STUDY YEARS

CY 2019 is studied for the purposes of establishing an environmental and operational baseline at BQN, which will aid in completing the Affected Environment portion of the EA.

The reconstruction of Runway 8-26 and associated improvements would be commenced in 2020 and completed by mid-2023. Therefore, the construction period for environmental analysis would span CY 2020 through 2023. Environmental analysis of Proposed Project alternatives' operational impacts, once the project is fully completed, would correspond to CY 2024, constituting the first full year of operations. For disclosure of potential additional operational impacts due to the Proposed Project, the forecast year 2029 will also be studied in the EA; to the extent such study is warranted under the NEPA.

In summary, the following study years will be considered in the EA:

- Construction Impacts: CY 2020 through CY 2023;
- Operational Impacts: Build-out operations in CY 2024 and 2029

4.2. AIR QUALITY

Pursuant to the federal Clean Air Act (CAA) and its amendments, the US Environmental Protection Agency (EPA) identifies air pollutants that cause or contribute to the endangerment of human health and or environmental welfare, and establishes air quality "criteria" that guide the establishment of air quality standards to regulate these pollutants (42 U.S.C. §§ 7408 - 7409). To date, EPA has established such criteria for six air pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), fine and respirable particulate matter ($PM_{2.5}$ and PM_{10}), and sulfur dioxide (SO_2), and has subsequently promulgated National Ambient Air Quality Standards (NAAQS) meant to safeguard public health (i.e., primary NAAQS) and environmental welfare (i.e., secondary NAAQS).[9]

EPA delegates authority to enforce the NAAQS with individual states. In Puerto Rico, the Environmental Quality Board's (EQB's) Air Quality Area is charged with demonstrating compliance with the NAAQS.

4.2.1. AFFECTED ENVIRONMENT

4.2.1.1. Air Quality Monitoring

EPA evaluates ambient monitoring data on a geographic basis, delineated by Core Based Statistical Areas (CBSA) or Metropolitan Statistical Areas (MSA) established by the US Office of Management and Budget and US Census Bureau. From each ambient monitor within a CBSA/MSA, EPA derives criteria pollutant *design values*, which are statistics that describe the air quality status of a given location relative to the level of the NAAQS. Areas where monitored ambient air concentrations (i.e., design values) are within an applicable NAAQS are considered in *attainment* of that NAAQS. If sufficient data are not available to make a determination, the area is instead deemed *attainment/unclassifiable.* Areas where monitored ambient air concentrations exceed the NAAQS are designated by EPA as *nonattainment* areas. Lastly, areas that have historically violated the NAAQS, but have since instituted controls and programs that have successfully remedied these violations are known as *maintenance* areas. According to the EPA, the municipality of Aguadilla is considered *attainment/unclassifiable* of all current NAAQS.

The current NAAQS are summarized on **Table 4.2-1**, along with EPA data from the nearest available air monitoring stations for the period of 2016-2018. EQB monitors air quality through several stations throughout the island. Of note, the closest air monitoring station is 34 miles southeast of the Airport and only monitors $PM_{2.5}$ concentrations.

[9] EPA. National Ambient Air Quality Standards. August 7, 2018 and October 8, 2019.

Table 4.2-1 Air Monitoring Data Summary (2016-2018)

Pollutant	Averaging Time	Level	Form	Concentration (Monitor ID, Distance from BQN)		
				72-001-0002 (34 mi SE)	72-033-0004 (64.5 mi E)	72-113-0004 (46.5 mi SE)
CO [76 FR 54294, Aug 31, 2011]	8-hour	9 ppm	Not to be exceeded more than once per year	--	--	Not exceeded
	1-hour	35 ppm		--	--	Not exceeded
Pb [81 FR 71906, October 18, 2016]	Rolling 3 month average	0.15 µg/m^3	Not to be exceeded	--	--	--
NO_2 [75 FR 6474, Feb 9, 2010] [77 FR 20218, April 3, 2012]	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	--	--	--
	Annual	53 ppb	Annual mean	--	--	--
O_3 [80 FR 65292, Oct 26, 2015]	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	--	--	--
Particle Pollution [78 FR 3085, Jan 15, 2013]	$PM_{2.5}$ Annual (primary)	12 µg/m^3	Annual mean, averaged over 3 years	6.5	--	8.7
	$PM_{2.5}$ Annual (secondary)	15 µg/m^3	Annual mean, averaged over 3 years			
	$PM_{2.5}$ 24-hour	35 µg/m^3	98th percentile, averaged over 3 years	20.9	--	27.5
	PM_{10} 24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years	--	Not exceeded	Not exceeded
SO_2 [77 FR 20218, April 3, 2012] [75 FR 35520, Jun 22, 2010]	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	--	21.3	--
	3-hour	0.5 ppm	Not to be exceeded more than once per year	--	Not exceeded	--

-- = not monitored; FR = Federal Register; ppb = parts per billion; ppm = parts per million; µg/m^3 = micrograms per cubic meter of air
Sources: FR, as above; and EPA AirData (https://www.epa.gov/outdoor-air-quality-data), accessed August 7, 2018 and October 8, 2019.

The second and third closest monitoring stations are within 46.5 and 64.5 miles of the Airport and monitor CO, O_3, PM_{10}, $PM_{2.5}$, and SO_2 concentrations; other pollutant monitoring data from more-distant monitors are excluded from the summary. Available data indicate no current violations of the monitored criteria NAAQS. As stated, the BQN area is considered attainment/unclassifiable of all NAAQS.

4.2.1.2. Baseline Air Emissions Inventory

BQN produces emissions of criteria air pollutants and their precursors due to the operation of a variety of mobile and stationary combustion devices at the Airport. Under current conditions, the bulk of these emissions are produced due to aircraft operations. Many larger commercial aircraft utilize Auxiliary Power Units to provide comfort air and power to instrumentation while at the gate, if not using gate infrastructure to do so. Ground support equipment are also used to service arriving and departing aircraft in terms of assisting in aircraft pushback from the gate, refueling, moving baggage and freight, cleaning and restocking aircraft, and other functions. Motor vehicle traffic on airport roadways and the operation of stationary combustion devices also contribute to emissions from BQN operations, but to a nominal degree.

For the purpose of baseline air emissions characterization, an inventory of aircraft emissions is provided on **Table 4.2-2**. Emissions of greenhouse gases (GHG) are also disclosed on **Table 4.2-2**; refer to **Section 4.3** of this EA for a discussion of GHG emissions.

Table 4.2-2 Baseline Emissions Inventory (CY 2019)

	Emissions (tons)[1]					GHG Emissions (metric tons)	
Source	**CO**	**NO_x**	**$PM_{2.5}$**	**PM_{10}**	**SO_x**	**VOC**	**CO_2e**
Aircraft	80.4	53.4	0.5	0.5	4.2	2.5	10,334.2

NO_x = nitrogen oxides; SO_x = sulfur oxides; VOC = volatile organic compounds

[1] NO_x and VOC are considered precursors to criteria pollutant formation (O_3 and $PM_{2.5}$)

Sources: Aviation Environmental Design Tool (AEDT) 2d, 2019.

4.2.2. ENVIRONMENTAL CONSEQUENCES

Air quality impact assessment methodology focuses on satisfying requirements of the CAA and NEPA. All emissions estimates and quantitative analyses were prepared using current, federally-approved emissions models and tools, in a manner consistent with the current FAA guidance. Detailed emissions estimation methodologies are provided within **Appendix D.**

For areas designated as nonattainment or maintenance of the NAAQS for criteria air pollutants by the EPA, the General Conformity Regulations (40 CFR §93.153 et seq.) of the CAA require a determination that air emissions from federally obligated actions are accounted for in a State Implementation Plan to control air quality.

As previously stated, BQN is located in an area designated by the EPA as attainment/unclassifiable with respect to all current NAAQS. Accordingly, the General Conformity

Regulations do not apply to the Proposed Project, and a detailed analysis and Conformity Determination are not required. Nevertheless, annual emissions inventories of construction emissions associated with the Proposed Project are provided for disclosure purposes. Neither Proposed Project Alternative would increase airport capacity or result in increased aircraft or other airport operations, therefore, no operational emission inventory was prepared, and the following analysis only considers temporary, short-term air quality impacts from construction activities.

4.2.2.1. Construction Emissions

Tables 4.2-3 through **4.2-6** discloses the construction period criteria pollutant emissions computed for Alternatives 2B and 2D. Construction activity levels and resulting criteria pollutant emissions are not expected to be substantially different between the two alternatives. As shown on **Tables 4.2-3** through **4.2-6**, the peak year of construction is 2020, where estimated emissions total 18.17 tons of CO, 13.71 tons of nitrogen oxides (NO_x), 23.62 tons of PM_{10}, 3.13 tons of $PM_{2.5}$, 0.32 tons of sulfur oxides (SO_x), and 26.73 tons of volatile organic compounds (VOC). Because the area is considered attainment/unclassifiable of all NAAQS, there are no applicable significance thresholds (CAA General Conformity de minimis thresholds) to which these emissions increases can be compared. Because construction emissions are temporary in nature, it is not likely that the construction emissions create a significant or lasting impact on air quality in the area.

Table 4.2-3 2020 Construction Emissions Inventories

Source	2020 Emissions (tons)					
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC
Off-road Equipment	8.59	9.80	0.62	0.60	0.03	2.54
On-road Vehicles	9.58	3.92	0.53	0.29	0.29	0.82
Asphalt Paving	--	--	--	--	--	23.37
Fugitive Dust	--	--	22.47	2.25	--	--
Total	**18.17**	**13.71**	**23.62**	**3.13**	**0.32**	**26.73**

Source: AECOM, 2019.

Table 4.2-4 2021 Construction Emissions Inventories

Source	2021 Emissions (tons)					
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC
Off-road Equipment	8.07	8.18	0.52	0.51	0.03	2.50
On-road Vehicles	9.06	3.57	0.50	0.26	0.26	0.74
Asphalt Paving	--	--	--	--	--	23.28
Fugitive Dust	--	--	22.30	2.23	--	--
Total	**17.13**	**11.75**	**23.32**	**3.00**	**0.29**	**26.52**

Source: AECOM, 2019.

Table 4.2-5 2022 Construction Emissions Inventories

Source	2022 Emissions (tons)					
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC
Off-road Equipment	7.65	7.21	0.45	0.44	0.03	2.46
On-road Vehicles	8.59	3.26	0.47	0.24	0.24	0.67
Asphalt Paving	--	--	--	--	--	23.19
Fugitive Dust	--	--	22.13	2.21	--	--
Total	**16.24**	**10.46**	**23.05**	**2.88**	**0.27**	**26.33**

Source: AECOM, 2019.

Table 4.2-6 2023 Construction Emissions Inventories

Source	2023 Emissions (tons)					
	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC
Off-road Equipment	7.36	6.50	0.40	0.39	0.03	2.44
On-road Vehicles	8.15	2.97	0.45	0.21	0.21	0.62
Asphalt Paving	--	--	--	--	--	23.19
Fugitive Dust	--	--	22.13	2.21	--	--
Total	**15.51**	**9.47**	**22.98**	**2.81**	**0.25**	**26.25**

Source: AECOM, 2019.

There is no applicable quantitative significance threshold against which emissions increases estimated for Alternatives 2B and 2D could be assessed, because BQN is located within a NAAQS attainment/unclassifiable area and the CAA General Conformity *de minimis* thresholds therefore do not apply.

The FAA's Aviation Emissions and Air Quality Handbook states that atmospheric dispersion modeling to convert the emissions estimates in this EA into predicted pollutant concentrations for direct comparison to the NAAQS is not necessary, because it was not requested by a reviewing agency or stakeholder during EA scoping.

Because neither Alternative 2B nor 2D is expected to generate operational or construction-related emissions that would cause a violation of the NAAQS, Alternative 2B or 2D would not exceed significant impact thresholds identified in FAA Order 1050.1F.

No-Action Alternative

Under the No-Action Alternative, no construction activities would occur, and the emissions associated with the operation of vehicles and aircraft at BQN would remain the same. Therefore, no impacts on ambient air quality under the No-Action Alternative would be expected.

4.2.2.2. Avoidance, Minimization and Mitigation Measures

Mitigation to reduce impacts below the threshold of significance is not required. However, construction-related emissions resulting from the proposed improvements, albeit temporary, can

be reduced by employing the following typical emissions reduction measures, in accordance with FAA AC 150/5370-10H, *Standards for Specifying Construction of Airports*:

- Suspension of construction activities during high-wind conditions;
- Creation of dust, odor and nuisance reporting system;
- Reduction of exposed erodible surface area through appropriate materials and equipment staging procedures;
- Cover of exposed surface areas with pavement or vegetation in an expeditious manner;
- Reduction of equipment idling times;
- Ensure contractor knowledge of appropriate fugitive dust and equipment exhaust controls;
- Soil and stock-pile stabilization via cover or periodic watering;
- Use of low- or zero-emissions equipment;
- Use of covered haul trucks and conveyors during materials transportation;
- Reduction of electrical generator usage wherever possible; and
- Prohibition of open burning for waste disposal.

4.3. CLIMATE

4.3.1. AFFECTED ENVIRONMENT

BQN is located within the subtropical moist forest life zone[10] with a mean annual rainfall of 1,100 to 2,200 millimeters and a mean annual temperature ranging from 18 to 24 degrees Celsius. The subtropical moist forest life zone is the dominant life zone on Puerto Rico covering more than 58% of the total land area.[11]

As indicated on **Table 4.2-2**, operations of aircraft at BQN emit an estimated 10,334.2 metric tons of carbon dioxide equivalent (CO_2e) annually under existing conditions.

4.3.2. ENVIRONMENTAL CONSEQUENCES

Construction of the Proposed Project and retained alternatives would result in an increase in GHG emissions, when compared to the No-Action Alternative. Accordingly, the emissions have been assessed quantitatively per the FAA's 1050.1F Desk Reference. All emissions estimates and quantitative analyses were prepared using current, federally-approved emissions models and tools, in a manner consistent with the current FAA guidance. Detailed emissions estimation methodologies are provided within **Appendix D.** Emissions inventory results and qualitatively

[10] Ewel, J.S. and J. L. Whitmore. *Ecological life zones of Puerto Rico and the US Virgin Islands*. USDA – Forest Serv. Res. Paper ITF-18. 72 p. 1973

[11] Reforesta, Inc. *Flora and Fauna Survey for Rafael Hernandez Airport Reconstruction, Aguadilla, Puerto Rico.* June 2018.

evaluated in terms of compliance with local climate change policy and adaptation strategies. Neither Proposed Project Alternative would increase airport capacity or result in increased aircraft or other airport operations, therefore, no operational GHG emission inventory was prepared, and the following analysis only considers temporary, short-term climate impacts from construction activities.

4.3.2.1. Construction Emissions

Construction activity levels and resulting GHG emissions are not expected to be substantially different between the two alternatives. Construction emissions of CO_2e GHG are presented on **Table 4.3-1** and indicate that roughly 34,064.33 metric tons would be emitted over the four-year construction period, which peaks in 2020.

Table 4.3-1 Construction Emissions Inventory for CO_2e

CO_2e Emissions (metric tons)			
2020	**2021**	**2022**	**2023**
8,601.14	8,539.17	8,477.11	8,446.91

Source: AECOM, 2019.

[1] Includes off-road equipment, on-road vehicles, and asphalt paving/fugitive dust.

The FAA has not established significance thresholds for aviation GHG emissions, nor have they identified specific factors to consider in making a significance determination for GHG emissions. Consequently, there is currently no quantitative or qualitative basis for comparison for the GHG emissions presented in this document, and therefore, emissions presented in this document are for disclosure purposes only. Based on the analysis conducted for this EA, GHG emissions associated with Alternatives 2B and 2D are minimal and would not exceed any reasonable threshold indicating a significant impact.

No-Action Alternative

Under the No-Action Alternative, no construction activities would occur. The operation of aircraft and vehicles at BQN contribute to GHGs, primarily as carbon dioxide (CO_2) from combustion. Under the No-Action Alternative, the levels of CO_2 emissions are not expected to increase significantly and will have no effect to climate.

4.3.2.2. Avoidance, Minimization and Mitigation Measures

Although the FAA has not established significance thresholds for aviation GHG emissions, no significant climate impacts are anticipated, and no mitigation measures are warranted. However, many voluntary measures are available to reduce construction- and operational-related air emissions (**Section 4.2.2.2**) would also serve to reduce fuel consumption associated with construction equipment and airport mobile sources, which would in turn reduce the level of GHG emissions occurring due to the Proposed Project.

4.4. COASTAL RESOURCES

4.4.1. AFFECTED ENVIRONMENT

Coastal resources comprise any natural resources or natural environments occurring in coastal waters or adjoining shorelines and are primarily protected by the Coastal Zone Management Act (CZMA), as well as the Coastal Barrier Resources Act, which governs development within the Coastal Barrier Resource System (CBRS). BQN as well as the geographical extents of study areas identified for this EA, is located within Puerto Rico's designated coastal area and therefore provisions of the Federal CZMA and the federally-approved Puerto Rico Coastal Zone Management Program (PRCZMP) apply to activities occurring at BQN. The PRCZMP was approved by the National Oceanic and Atmospheric Administration and comprises a network of state agencies led by the Puerto Rico DNER. Section 307 of the CZMA requires that projects undertaken by Federal agencies within the coastal zone must demonstrate consistency with the PRCZMP and the enforceable policies contained therein.

The PRPB's Coastal Zone Unit is responsible for implementing the Federal Consistency Certification process in Puerto Rico. On December 21, 2018, PRPB issued a Certification for the Proposed Project. **Section 4.4.2** further discusses the PRCZMP enforceable policies as applied to the Proposed Project.

4.4.2. ENVIRONMENTAL CONSEQUENCES

The Proposed Project is not located in a coral reef ecosystem or a CBRS unit, nor would it impact these features; therefore, these factors are not relevant to the Proposed Project. PRPB's Coastal Zone Unit was consulted during the EA scoping process and later issued a Federal Consistency Certification for the Proposed Project (see **Appendix E**). Because the Proposed Project has been certified to be consistent with the PRCZMP, the coastal environment would not be significantly adversely impacted by the Proposed Project and its alternatives.

Table 4.4-1 depicts the Enforceable Coastal Policies contained in the PRCZMP and the consistency status for Alternatives 2B and 2D with each policy.

No-Action Alternative

Under the No-Action Alternative, no new impacts within the Coastal Zone would occur and no Federal Consistency Certification process would be required.

Table 4.4-1 Coastal Consistency Determination Summary

Enforceable Coastal Policy	Consistency Determination	
	Alternative 2B	**Alternative 2D**
Policy A.1: Projects or activities that are located in the terrestrial territory (uplands) within the jurisdiction of the island or that affect land uses in it, must comply with the policies and rules established by the PRPB in relation to land uses and development. The PRPB established the Puerto Rico Land Use Plan as the main land development guide. It establishes a classification of land uses for the whole Puerto Rico island. The PRPB in coordination with the Municipalities and other entities also establishes the specific zoning rules ("Calificación") that applies to the Puerto Rico lands. Therefore, any activity or project must be consistent with the PRPB rules applicable to land uses. Any project to be constructed in the Puerto Rico uplands must also obtain a construction permit from the Puerto Rico Permit Management Office (OGPe).	Consistent. The Proposed Project Alternative is designed to achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1. Consistency with Policy A.1 would be achieved by implementing measures detailed in Section 4.9.2.1 of this EA. All construction work undertaken would commence only upon approval and issuance of a construction permit from the OGPe.	Consistent. The Proposed Project Alternative is designed to achieve current FAA design standards and land use compatibility requirements for RPZs, as directed by AC 150/5300-13A, Change 1. Consistency with Policy A.1 would be achieved by implementing measures detailed in Section 4.9.2.1 of this EA. All construction work undertaken would commence only upon approval and issuance of a construction permit from the OGPe.
Policy B: Policies about projects and construction for water dependent uses, or activities performed in the territorial sea or waters of the Puerto Rico jurisdiction. The Puerto Rico government shares jurisdiction in the management of the US Waters with the USACE, the USCG and US Customs and Border Patrol among other Federal Agencies. The waters of the Puerto Rico territory are a "Public Domain Good" administered by the DNER. Projects or activities that affects the sea or waters within the Puerto Rico jurisdiction, must obtain an authorization or "Land Use Concession" from the DNER Secretary.	Consistent/Not Applicable. The Proposed Project Alternative would occur solely on land and would not directly affect the territorial sea or waters of the Puerto Rico jurisdiction.	Consistent/Not Applicable. The Proposed Project Alternative would occur solely on land and would not directly affect the territorial sea or waters of the Puerto Rico jurisdiction.
Policy C.1: Any development or activities in land or waters of Puerto Rico that does not qualify as a "Categorical Exclusion" (according to the list established by the EQB in Resolution Number R-11-173), must comply with Article 4B(3) of this law. Non-excluded projects or activities must complete an environmental planning process by preparing and submitting an environmental evaluation or assessment document with the required environmental impact analysis. Federal	Consistent. This EA and the detailed environmental impact analyses contained within are consistent with and meet the requirements of Policy C.1 and the statutes applied by reference therein.	Consistent. This EA and the detailed environmental impact analyses contained within are consistent with and meet the requirements of Policy C.1 and the statutes applied by reference therein.

Enforceable Coastal Policy	Consistency Determination	
	Alternative 2B	**Alternative 2D**
Agencies that are also required to comply with the NEPA may submit the same document to comply with the Puerto Rico Environmental Policy Law as long as it contains the required information and analysis according to the EQB Regulation Number 88584 (Regulation for the Environmental Evaluation Process). Determination for the Proposed Project Alternative: Consistent. This EA and the detailed environmental impact analyses contained within are consistent with and meet the requirements of Policy C1 and the statutes applied by reference therein.		
Policy C.2: Other policies administered by the DNER for the protection and conservation of natural resources (hunting, fishing, forestry, forest planting, forest reserves, land acquisition, nurseries, mining, watersheds, flooding, extraction of minerals, conservation and development of Culebra, wildlife, squatters, litter, coral resources, caves, caverns, and sinkholes).	Consistent. The Proposed Project would not include hunting, fishing, forestry, forest planting, land acquisition, mining, flooding, or the extraction of minerals. The Proposed Project would have no effects on forest reserves, nurseries, watersheds, the Island of Culebra, squatters, caves, or caverns. No litter would be produced by the action. Effects to wildlife would be minor and the action would be in compliance with the Endangered Species Act. The Proposed Project Alternative has been specifically designed to avoid direct impacts to the sinkhole located at the east end of the airfield.	Consistent. The Proposed Project would not include hunting, fishing, forestry, forest planting, land acquisition, mining, flooding, or the extraction of minerals. The Proposed Project would have no effects on forest reserves, nurseries, watersheds, the Island of Culebra, squatters, caves, or caverns. No litter would be produced by the action. Effects to wildlife would be minor and the action would be in compliance with the Endangered Species Act. The Proposed Project Alternative has been specifically designed to avoid direct impacts to the sinkhole located at the east end of the airfield.
Policy C.3: Policies for air, water soil, noise and lighting pollution control. Puerto Rico Environmental Policy Law (Law No. 416 of September 22, 2004): The EQB have the ministerial responsibility to implement all the provisions of this law related to air, water, soil, noise and lighting pollution. This agency is also responsible to establish and implement the Puerto Rico Water Quality Standards according to section 303 of the Clean Water Act (CWA).	Consistent. All construction and operational activities associated with the Proposed Project Alternative would be implemented in compliance with the CAA and CWA. Temporary increases in air emissions would occur during the construction phase but are expected to remain below significance thresholds. Operational emissions are not expected to change	Consistent. All construction and operational activities associated with the Proposed Project Alternative would be implemented in compliance with the CAA and CWA. Temporary increases in air emissions would occur during the construction phase but are expected to remain below significance thresholds. Operational emissions are not expected

Enforceable Coastal Policy	Consistency Determination	
	Alternative 2B	**Alternative 2D**
	from current rates as a result of the Proposed Project (see Section 4.2). Hazardous materials that may be used in the construction phase and any hazardous or regulated waste that may be generated during demolition activities associated with the project would be stored, managed, or disposed in accordance with all applicable federal and territorial laws and regulations (see Section 4.6). Substantial changes in the viewshed from light emissions compared to existing conditions would not occur with the Proposed Project. Resulting changes in off-airport noise exposure are consistent with existing and future land uses. Impacts related to noise would result from Alternative 2B, but would be mitigated as described in Section 4.9.2.1 of this EA.	to change from current rates as a result of the Proposed Project (see Section 4.2). Hazardous materials that may be used in the construction phase and any hazardous or regulated waste that may be generated during demolition activities associated with the project would be stored, managed, or disposed in accordance with all applicable federal and territorial laws and regulations (see Section 4.6). Substantial changes in the viewshed from light emissions compared to existing conditions would not occur with the Proposed Project. . Resulting changes in off-airport noise exposure are consistent with existing and future land uses. Impacts related to noise would result from Alternative 2D, but would be mitigated as described in Section 4.9.2.1 of this EA.
Policy D: Policies for the conservation of historic and archaeological resources. Proposed activities and projects must not have negative impacts on cultural resources of Puerto Rico. The Environmental Evaluation or Assessment documents must include an evaluation of possible impacts on historic and archaeological resources. OGPe and the PRPB consult the Puerto Rican Culture Institute and the State Historic Preservation as part of the required evaluation process for compliance with the Puerto Rico Environmental Policy Law and the Federal Consistency review.	<u>Consistent.</u> This EA includes a survey and analysis of impacts to historical, architectural, archaeological, and cultural resources and has been undertaken in coordination and consultation with the Puerto Rico State Historic Preservation Office (PRSHPO). PRSHPO has indicated that BQN (formerly Ramey Air Force Base) constitutes a historic district, and that all structures historically associated with the former base individually contribute to the historic district. Demolition of buildings to the south of the proposed runway reconstruction location and reconfiguration of Runway 8-26 to serve as a taxiway constitute adverse effects under Section 106 of the NHPA. FAA,	<u>Consistent.</u> This EA includes a survey and analysis of impacts to historical, architectural, archaeological, and cultural resources and has been undertaken in coordination and consultation with the Puerto Rico State Historic Preservation Office (PRSHPO). PRSHPO has indicated that BQN (formerly Ramey Air Force Base) constitutes a historic district, and that all structures historically associated with the former base individually contribute to the historic district. Demolition of buildings to the south of the proposed runway reconstruction location and reconfiguration of Runway 8-26 to serve as a taxiway constitute adverse

Enforceable Coastal Policy	Consistency Determination	
	Alternative 2B	**Alternative 2D**
	PRPA, and PRSHPO have entered into a Memorandum of Agreement (MOA) to resolve adverse effects identified by PRSHPO. Section 4.7 and Chapter 5 provide additional information regarding historical, architectural, archaeological, and cultural resources and PRSHPO consultation and coordination.	effects under Section 106 of the NHPA. FAA, PRPA, and PRSHPO have entered into a MOA to resolve adverse effects identified by PRSHPO. Section 4.7 and Chapter 5 provide additional information regarding historical, architectural, archaeological, and cultural resources and PRSHPO consultation and coordination.
Policy E: Other Enforceable Policies (soil conservation districts, natural heritage, earthquake safety, natural hazards, flood hazards).	Consistent. The Proposed Project Alternative would not involve or affect soil integrity, issues of natural heritage, or flood hazard areas. Furthermore, implementing the project would generally improve human safety at BQN compared to the existing conditions.	Consistent. The Proposed Project Alternative would not involve or affect soil integrity, issues of natural heritage, or flood hazard areas. Furthermore, implementing the project would generally improve human safety at BQN compared to the existing conditions.

Source: PRPB, 2009.

4.4.2.1. Avoidance, Minimization and Mitigation Measures

As stated in **Table 4.4-1**, FAA, PRPA, and PRSHPO have entered into a MOA to resolve PRSHPO's finding of adverse effects to historic properties. Noise impacts to residential parcels will be mitigated by offering landowners a choice of options including purchase assurance and sales assistance, as described in **Section 4.9.2.1**. By implementing these mitigation measures, significant coastal resource impacts would not be incurred due to the Proposed Project, and the Proposed Project is certified to be consistent with the PRCZMP. No additional mitigation is required; however, impact minimization measures and best management practices (BMPs) are discussed throughout the environmental consequences chapter of this EA for specific environmental resources. Adopting these measures and practices would serve to reduce or minimize any effects of the Proposed Project on coastal resources.

4.5. DOT SECTION 4(F) RESOURCES

4.5.1. AFFECTED ENVIRONMENT

Resources that meet criteria for Section 4(f) protection include publicly-owned parks, recreational areas, wildlife and waterfowl refuges, and significant historic sites (properties listed on or eligible for listing on the NRHP, as discussed in **Section 4.7**). The term "Section 4(f) resource" in this evaluation refers to any specific site or property meeting DOT Act criteria.

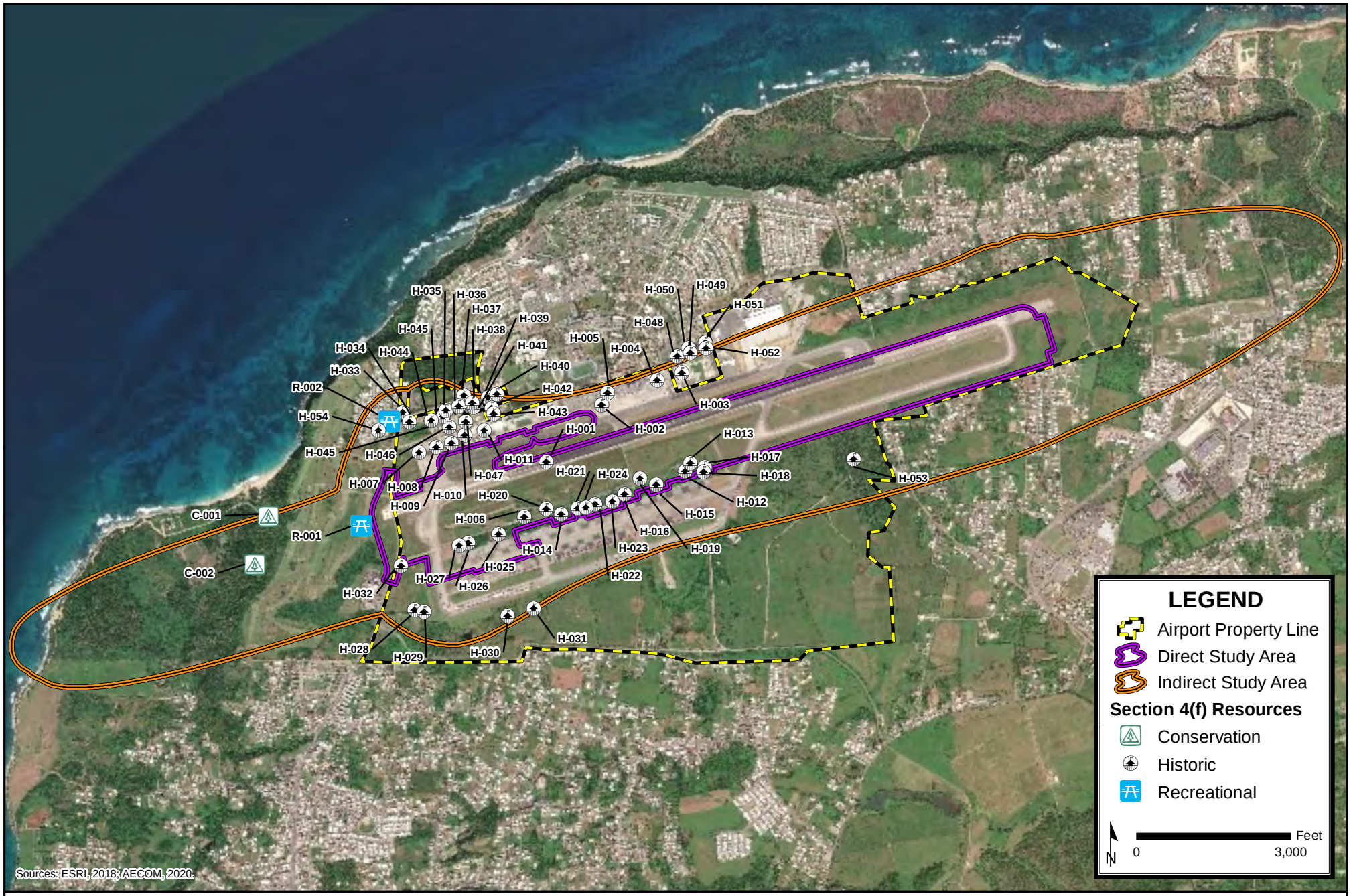
A review of available information from a variety of sources including Aguadilla Municipality and state databases, documented the location of publicly-owned parks, recreational areas, wildlife, and waterfowl refuges within the vicinity of BQN. During cultural resources consultations between the FAA and PRSHPO, the PRSHPO indicated that it considers all of BQN, which occupies the site of the former Ramey Air Force Base, to be a historic district eligible for the NRHP, and that all extant structures constructed as part of the former Borinquen Field and Ramey Air Force Base are individually contributing resources. As such, these structures are afforded Section 4(f) protections. **Table 4.5-1** and **Figure 4.5-1** provide the locations and an overview of Section 4(f) properties identified within the DSA and ISA. A detailed summary and description of Section 4(f) resources are provided in **Appendix K**.

Table 4.5-1 Section 4(f) Properties Within the ISA

Resource Category	Map ID (Figure 4.5-1)	Name
Historic Resource	H-001	Runway 8-26
	H-002	Building 400 - Control Tower
	H-003	Building 402 - Hangar 2
	H-004	Building 403 - Hangar 3
	H-005	Building 405 -Hangar 5
	H-006	Building 3 - Gazebo
	H-007	Building 571 - Nose Dock Hangar
	H-008	Building 572 - Nose Dock Hangar
	H-009	Building 573 - Nose Dock Hangar
	H-010	Building 574 - Nose Dock Hangar
	H-011	Building 575 - Hangar

Resource Category	Map ID (Figure 4.5-1)	Name
	H-012	Building 1029 - Ground Support Equipment Shop
	H-013	Building 1031 - Electric Power Station
	H-014	Building 1132 - Squadron Operations
	H-015	Building 1070 - Aircraft Maintenance Organizational Shop
	H-016	Building 1071 - Squadron Operations
	H-017	Building 1072 - Weapons and Base Systems Shop
	H-018	Building 1073 - Traffic Check House
	H-019	Building 1089 - Weather Observation Tower
	H-020	Building 1104 -Storage and Supply
	H-021	Building 1121 -Electrical Station
	H-022	Building 1128 - Armaments and Avionics Shop
	H-023	Building 1129 - Armaments and Electrical Shop
	H-024	Building 1133 -Captive Water Supply Tank Building
	H-025	Building 1245 - Readiness Crew Facility
	H-026	Building 1251 - Target Intelligence
	H-027	Building 1270 - Storage
	H-028	Building 1203 - Small Arms Magazine
	H-029	Building 1204 - Small Arms Magazine
	H-030	Building 1214 - Fuel Storage Tank
	H-031	Building 1215 - Fuel Storage Tank
	H-032	Building 1230 - Storage
	H-033	Building 501 - Motor Transportation and Repair)
	H-034	Building 502 - Ordnance Repair Shop
	H-035	Building 503 - Quartermaster Warehouse
	H-036	Building 504 – Bakery
	H-037	Building 505 - Utility Shop
	H-038	Building 506 - Commissary and Quartermaster Warehouse
	H-039	Building 507 - Power Plant
	H-040	Building 508 - Laundry
	H-041	Building 509 - Cold Storage Plant
	H-042	Building 510 - Air Corps Garage
	H-043	Building 511 - Air Corps Garage
	H-044	Building 512 - Quartermaster Warehouse
	H-045	Building 513 - Quartermaster Warehouse
	H-046	Building 524 - Pavement and Grounds
	H-047	Building 543 - Veterinary Office
	H-048	Building 406 - Fire Station
	H-049	Building 407 - Paint, Oil, and Dope House
	H-050	Building 408 - Photographic Laboratory
	H-051	Building 409 - Air Corps Garage
	H-052	Building 410 - Air Corps Garage
Historic Area	H-053	Civilian War Housing
	H-054	Fullana Neighborhood (Partial)
Recreational Area	R-001	Punta Borinquen Golf Course and Club House
	R-002	Aguadilla (Ramey) Skate and Splash Park
Conservation Area	C-001	Conservation Area (Unnamed)
	C-002	Conservation Area (Unnamed)

Sources: AECOM 2020



RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

DOT SECTION 4(F) RESOURCES

FIGURE
4.5-1

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4.5.2. ENVIRONMENTAL CONSEQUENCES

A review was conducted to determine if any resources would have the potential to be directly or indirectly impacted by the Proposed Project Alternatives or the No-Action Alternative with regard to the protective provisions of Section 4(f) of the DOT Act. Section 4(f) of the DOT Act provides that the Secretary of Transportation will not approve any program or project that requires the use of publicly-owned land of a public park, recreation area; or wildlife and waterfowl refuge of national, state, or local significance; or land of an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof, unless:

- There is no feasible and prudent alternative to use of such land and
- The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

During the NEPA process, the FAA considers whether the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a constructive use based on a determination that the project would substantially impair the Section 4(f) resource. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished. A significant impact under NEPA would not occur if appropriate mitigation measures avoid or minimize the effects of the use below the threshold of significance. If Section 4(f) property is used, the FAA is responsible for complying with Section 4(f) even if the impacts are less than significant for NEPA purposes. A detailed evaluation of impacts to Section 4(f) resources is provided in **Appendix K**, including demonstration that the FAA preformed all possible planning to identify that there were no reasonable and prudent alternatives to avoid the 4(f) resources. **Sections 4.5.2.1** and **4.5.2.2** below summarize the findings of the Section 4(f) evaluation, including any measures to minimize harm (i.e., mitigation) that the FAA has identified.

4.5.2.1. Physical Use

Physical use of a Section 4(f) property by a project occurs in any of the following circumstances (23 CFR 774.17):

- Land from the Section 4(f) property is permanently incorporated into a transportation facility; or
- There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose, as determined by the criteria in 23 CFR 774.13(d) (i.e., when all or part of the Section 4(f) property is required for project construction-related activities).

As discussed in **Chapter 3**, Alternatives 2B and 2D would include reconstruction of Runway 8-26 approximately 500 feet to the south of its current location. This would require the demolition and removal of 21 existing structures south of the relocated runway to achieve compliance with 14 CFR 77.17(a)(5), which prevents the persistence or placement of objects within the surface of a

takeoff and/or landing area of an airport, or within any imaginary surface (including, primary, horizontal, conical, approach or transitional surfaces). 16 of these structures are considered by PRSHPO to be eligible for NRHP inclusion and are therefore Section 4(f) resources, as they were constructed as part of Ramey Air Force Base. Demolition and removal constitutes physical use of these resources.

The Proposed Project would also reconfigure the existing Runway 8-26 to serve as a full-length parallel taxiway for the reconstructed runway to the south. This would require relocation of NAVAIDs as well as repairing and reconstructing portions of the existing pavements. Approximately 66% of the existing pavements have not been repaired in over 50 years, and are therefore part of historic pavements installed at the former Ramey Air Force Base[12]. PRSHPO considers the existing Runway 8-26 to be a historic structure eligible for inclusion in the NRHP, and therefore a Section 4(f) resource. As such, the existing runway would experience physical use as a result of the Proposed Project.

Table 4.5-2 provides a summary of physical use of Section 4(f) resources that would result from the Proposed Project.

Table 4.5-2 Physical Use of Section 4(f) Resources

Resource Category	Map ID (Figure 4.5-1)	Name	Description of Physical Use
Historic Structure	H-001	Runway 8-26	Conversion of runway to parallel taxiway will require removal and replacement of historic pavement materials.
	H-006	Building 3 - Gazebo	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-012	Building 1029 - Ground Support Equipment Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-013	Building 1031 - Electric Power Station	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-014	Building 1132 - Squadron Operations	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-015	Building 1070 - Aircraft Maintenance Organizational Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-016	Building 1071 - Squadron Operations	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-017	Building 1072 - Weapons and Base Systems Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).

[12] *Regional Airport Pavement Maintenance and Management Program, Rafael Hernandez Airport (BQN)*. Prepared by Kimley-Horn and Associates, Inc., June 2016.

Resource Category	Map ID (Figure 4.5-1)	Name	Description of Physical Use
	H-018	Building 1073 - Traffic Check House	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-019	Building 1089 - Weather Observation Tower	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-020	Building 1104 - Storage and Supply	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-021	Building 1121 - Electrical Station	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-022	Building 1128 - Armaments and Avionics Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-023	Building 1129 - Armaments and Electrical Shop	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-024	Building 1133 - Captive Water Supply Tank Building	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-025	Building 1245 - Readiness Crew Facility	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).
	H-026	Building 1251 - Target Intelligence	Demolition and removal of historic structure to comply with 14 CFR 77.17(a)(5).

Source: AECOM 2020

No-Action Alternative

Under the No-Action Alternative, the existing airfield infrastructure would remain in its current location, no demolition of buildings that are eligible for inclusion in the NRHP would be required, and these Section 4(f) resources would not experience physical use. Because of the failed state of significant portions of existing Runway 8-26 (see **Section 2.1.2**), substantial rehabilitation and possible reconstruction of the pavements would eventually be required to comply with FAA standards and regulations, which would result in physical use of this Section 4(f) resource at that time.

4.5.2.2. Constructive Use

A "constructive use" of a Section 4(f) property is defined at 23 CFR 774.15(a) as a use which occurs when the transportation project does not incorporate land from the Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features or attributes that qualify the property for protection under Section 4(f) are substantially impaired. The Proposed Project's indirect effects in the following areas is necessary to ascertain whether a constructive use of any Section 4(f) land in the proximity to the Proposed Project would occur:

- Air Quality: Construction emissions would occur but would by temporary in nature and would not create a significant or lasting impact on air quality in the area. Operational emissions would not increase at BQN due to either Proposed Project Alternative, as compared to the No-Action Alternative. The region does not currently experience violations of any NAAQS and neither construction nor operation of the Proposed Project is expected to cause or contribute to exceedances. It is unlikely that either Proposed Project Alternative would cause air quality impacts that affect the use of a Section 4(f) resource.

- Light Emissions and Visual Impacts: The lighting modifications associated with the Proposed Project are not expected to cause changes in light emissions resulting in substantial annoyance or causing interference with normal activities at Section 4(f) properties. Relocation of runway-associated lighting to the south of its current location would increase light emissions and visual impacts to Section 4(f) resources on the southern side of the DSA and ISA while slightly decreasing these impacts relative to existing conditions for Section 4(f) resources in the northern portion of the DSA and ISA. Section 4(f) resources that would experience an increase in light emissions and visual impacts are structures located on the Airport, and the impacts would not impair the use or value of the Section 4(f) resources.

- Noise: analysis of predicted noise levels at Section 4(f) resources identified for this EA (see **Section 4.9.2**) indicates that only minor and insignificant noise increases would occur for Section 4(f) resources with the Proposed Project compared to the No-Action Alternative. As shown in **Figures 4.9-1** and **4.9-3** through **4.9-6**, the DNL 60 dB and DNL 65 dB contours would shift to the south of their current locations, which would cause Section 4(f) resources in the southern part of the DSA and ISA to experience elevated noise levels as comparted to the No-Action Alternative. Conversely, Section 4(f) resources located in the northern section of the DSA and ISA would experience a decrease in noise impacts with the Proposed Project. Punta Borinquen Golf Course (Map ID R-001) would experience elevated noise levels across its southern portion with the Proposed Project, while an area of roughly the same size in the northern portion of the golf course would experience a corresponding decrease in noise levels. The highest noise levels experienced at the golf course (DNL 65 dB) would remain fully compatible with land use compatibility guidelines established at Title 14 CFR Part 150 (DNL 75 to 80 dB; see **Table 4.9-1**). This Section 4(f) resource would experience no net constructive use. Noise levels affecting all other Section 4(f) resources would remain consistent with these land use compatibility guidelines. Noise impacts incurred by the Proposed Project would not impair the use of any Section 4(f) resource.

Because neither Alternative 2B nor 2D would cause new indirect environmental impacts that would constitute a significant impairment of Section 4(f) resources, no constructive use would be incurred as a result of the Proposed Project.

No-Action Alternative

Under the No-Action Alternative, Runway 8-26 would not be reconstructed at the proposed location, and the existing Runway 8-26 would not be converted to a taxiway; therefore, the minor, short-term construction related air quality impacts associated with the Action Alternatives would not occur. However, Runway 8-26 would eventually require significant rehabilitation and/or reconstruction to comply with FAA standards, which would result in minor, short-term air quality impacts to Section 4(f) resources. Operational emission levels would be expected to continue to increase incrementally over time as a result of expected incremental increases in airport operations. Visual impacts and impacts from light emissions as well as noise impacts from aircraft would generally remain unchanged from the current conditions. No new Section 4(f) properties would experience constructive use.

4.5.2.3. Avoidance, Minimization and Mitigation Measures

In summary, both Runway 8-26 and 16 of the 21 buildings to be demolished as a result of both Alternatives 2B and 2D are considered Section 4(f) properties with significant direct, physical use as defined at 23 CFR 774.17. No constructive use impacts have been identified. The direct physical use of these properties is significant because they are each individually considered to be contributing resources to a historic district as determined in consultation with PRSHPO as required by Section 106 of the NHPA. The use is not *de minimis* in nature because alterations to the affected Section 4(f) properties constitute an adverse effect to historic resources per 36 CFR 800.

The FAA has performed all possible planning to confirm that there are no feasible and prudent avoidance alternatives to the Proposed Project's impacts on Section 4(f) properties (**Appendix K**). An alternative is not considered feasible if it cannot be built as a matter of sound engineering judgment (23 CFR 774.17). Further, an alternative is not considered prudent if it compromises the project to a degree that it is unreasonable to proceed in light of its purpose and need, results in unacceptable safety or operational problems, causes significant or disproportionate social, economic or environmental impacts after mitigation, or results in additional costs of extraordinary magnitude.

Table 4.5-3 summarizes the alternatives developed for this EA and considered by FAA, among others specifically added within the context of Section 4(f), along with a determination of whether they are feasible or prudent. Of the feasible prudent alternatives, Alternatives 2B and 2D would not avoid the Section 4(f) resources, and on balance, both of these alternatives present the same level of harm to the Section 4(f) resources in question. Therefore, either Alternative 2B or 2D could constitute the "least overall harm" alternative under Section 4(f).

Table 4.5-3 Section 4(f) Avoidance Alternatives Analysis

Criterion[1]	Alternative					
	1B	**1C**	**2B**	**2C**	**2D**	**No-Action**
Feasible – can be constructed/ implemented as a matter of sound engineering judgment	Yes	Yes	Yes	Yes	Yes	Yes
Prudent – Meets Purpose and Need	No	No	Yes	Yes	Yes	No
Prudent – Avoids unacceptable safety or operational problems	No	No	Yes	Yes	Yes	No
Prudent – Avoids disproportionate social, environmental or economic impacts	Yes	No	Yes	No	Yes	Yes
Prudent – Avoids Extraordinary Costs[2]	Yes	Yes	Yes	Yes	Yes	Yes
Result	**Feasible, not prudent**	**Feasible, not prudent**	**Feasible and Prudent**	**Feasible, not prudent**	**Feasible and Prudent**	**Feasible, not prudent**

Source: AECOM, 2020.
Notes:
[1] Chapter 3, Alternatives, provides additional information on purpose and need, constructability, safety and environmental issues related to each alternative
[2.]"Extraordinary Costs" are defined as disproportionately costs higher than other reasonable alternatives under consideration (e.g., order of magnitude increase)..

Because these alternatives unavoidably impact Section 4(f) resources, mitigation is required to minimize the harm incurred. Each impacted Section 4(f) resource individually contributes to the NRHP-eligible Ramey Air Force Base historic district. Mitigations proposed for adverse effects under Section 106 and ratified with a MOA between FAA, PRPA and PRSHPO constitute the mitigation measures under Section 4(f). By adhering to the MOA stipulations discussed in **Section 4.7.2.1** for cultural resources, the FAA will mitigate significant Section 4(f) impacts associated with the Proposed Project.

4.6. HAZARDOUS MATERIALS, POLLUTION PREVENTION AND SOLID WASTE

4.6.1. AFFECTED ENVIRONMENT

To characterize the affected environment with respect to current/historical contamination at BQN, and to evaluate potential for hazardous waste and contamination related impacts on the Proposed Project, an environmental records search was performed by Environmental Data Resources (EDR) which queried available environmental records from Federal and state environmental databases. In addition, EPA's Envirofacts Database[13] was also reviewed for potential environmental records occurring within a one-mile radius of BQN. No sites in the EPA's *Comprehensive Environmental Response, Compensation, and Liability Information System* (CERCLIS), which contains information on potential hazardous waste sites and remedial activities, and no sites on the EPA's *National Priorities List* (NPL or "Superfund") are located within a one-mile radius of BQN. Records located on or surrounding BQN property were uncovered within the following 12 databases:

- Department of Defense (DoD): contains federally owned or administered lands, administered by the DoD, that have any area equal to or greater than 640 acres of the US, Puerto Rico, and the US Virgin Islands.
- Enforcement and Compliance History Online (ECHO): provides integrated compliance and enforcement information for facilities regulated nationwide.
- Facility Index System (FINDS): contains facility information and leads to other sources of information for further detail.
- Formerly Used Defense Sites (FUDS): former defense site properties where the USACE has evaluated the need to take, is actively taking, or has historically taken, remedial actions.
- Integrated Compliance Information System (ICIS): supports the information needs of the national enforcement and compliance program as well as the needs of the National Pollutant Discharge Elimination System (NPDES) Program.
- Leaking Underground Storage Tank (PR LUST): contains inventory of reported LUST incidents in Puerto Rico.
- NPDES: indicates that a facility currently maintains or has historically obtained a discharge permit under the NPDES.

[13] EPA. Envirofacts Database accessed from https://enviro.epa.gov/ on October 3, 2019.

- NY MANIFEST: Manifest that lists and tracks hazardous waste from the generator through transporters to a treatment, storage and disposal facility.
- NJ MANIFEST: Manifest that lists and tracks hazardous waste from the generator through transporters to a treatment, storage and disposal facility.
- Underground Storage Tank (PR UST): contains storage tank facility information for Puerto Rico.
- Resource Conservation and Recovery Act Information System (RCRAInfo): national program management and inventory system about hazardous waste handlers.
- RCRA Conditionally-Exempt Small Quantity Generator (CESQG): registrants are currently or have historically been subject to regulations for CESQG under the RCRA. Conditionally exempt signifies that the facility generates 100 kilogram (kg) or less of hazardous waste per calendar month, accumulates 1,000 kg or less of hazardous waste at any time, and/or generates or accumulates less than 1 kg of acutely hazardous waste per calendar month.
- Superfund Enterprise Management System Archive (SEMS-ARCHIVE): sites that have not further interest under the Federal Superfund Program based on available information. Archived status indicates that assessment at site has been completed and location not judged to be potential NPL site.

Available historical aerial photographs were also collected and evaluated. The results of the evaluation are presented in the following sections.

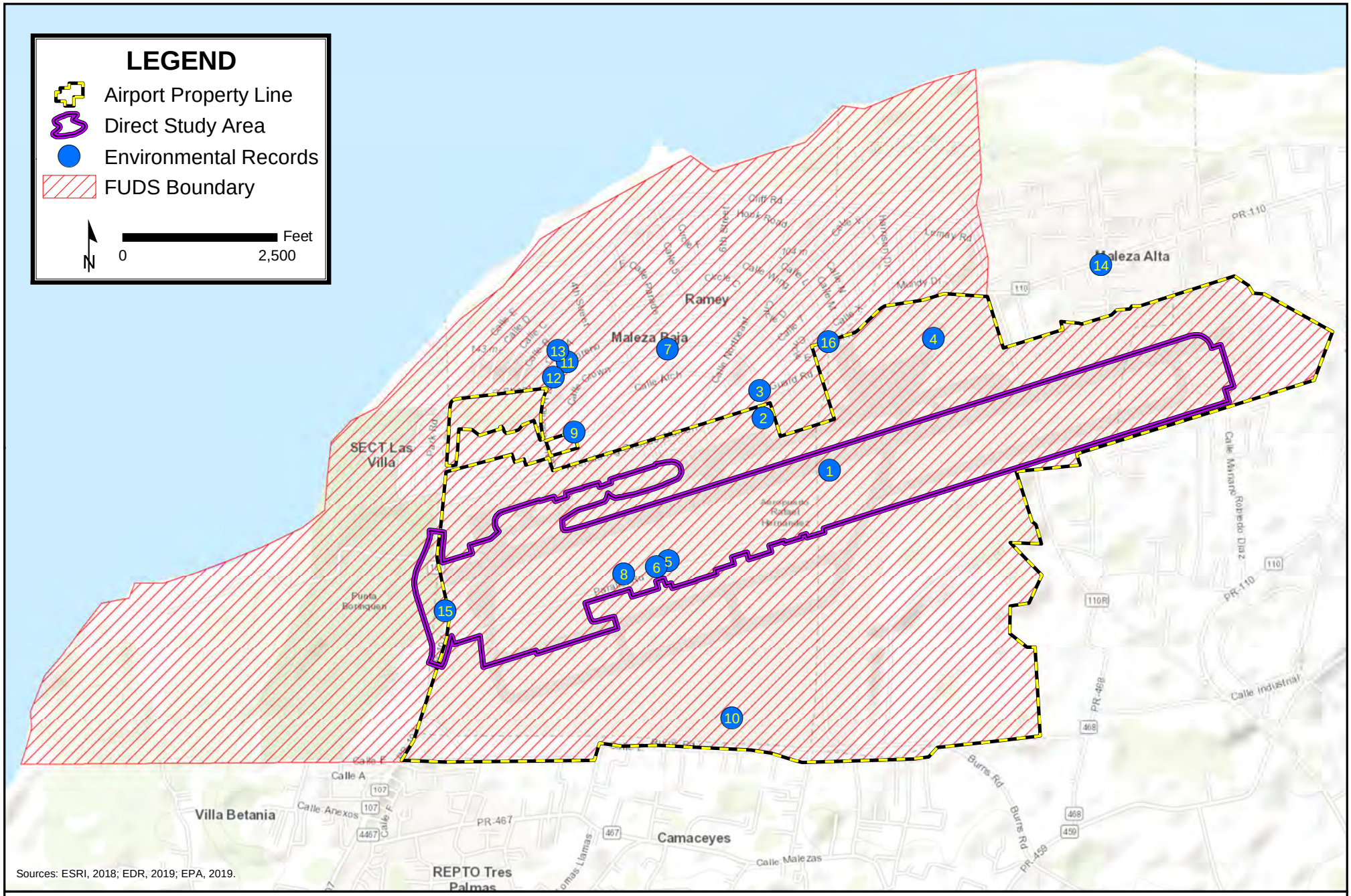
The results of the environmental records searches described above are depicted graphically on **Figure 4.6-1**. Results are also described in detail on **Table 4.6-1** for those records that likely occur on existing and proposed Airport property based on best available geographic data. Records occurring within or immediately adjacent to the DSA for this EA (i.e., within 150 feet) are highlighted in red. Environmental records included in the analysis are shown in **Appendix F.1** (electronic EA only).

No sites in the EPA's CERCLIS, which contains information on potential hazardous waste sites and remedial activities, and no sites on the EPA's NPL are located within a one-mile radius of BQN.

4.6.2. ENVIRONMENTAL CONSEQUENCES

4.6.2.1. Construction Impacts

During construction, contractor staging areas will be located at various locations in the DSA. The staging areas will likely include portable aboveground storage tanks or fuel storage. The construction contractor(s) will be required to implement pollution prevention, spill prevention, and response plans documenting the measures that will be taken to prevent accidental releases to the environment and, should they occur, the actions that will be undertaken to minimize the environmental impact.



Path: C:\Users\tia.norman\Desktop\BQN GIS\mxd\Figure 4-6-1_Env Records_rev0.mxd, Date Saved: 6/24/2020 12:51:23 PM

RAFAEL HERNANDEZ AIRPORT

RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL RECORDS

FIGURE
4.6-1

Table 4.6-1 Environmental Records Search Summary

Map ID	Site Name	Database(s)	Description
1	Rafael Hernandez Airport/FEDEX Express 405 Hangar Road Aguadilla, PR 00604	FINDS, ECHO, NPDES	Facility is tracked in the Emissions Inventory System pursuant to the CAA. Minor NPDES permit for stormwater discharge issued in October 2015 that expires in June 2020. No violations reported.
2	Rafael Hernandez Airport Autoridad De Los Puertos, Box 250466 Aguadilla, PR 00604	ICIS	Administrative Compliance Order (non-penalty) documented at site. Respondents failed to comply with all the applicable requirements of 40 CFR Part 61 Subpart M. The case is an asbestos remediation case, involving a failure to notify, failure to conduct an asbestos building survey or inspection, waste disposal and work practice violations under the asbestos National Emission Standards for Hazardous Air Pollutants. Case was resolved in November 2012.
3	US Coast Guard Air Station Borinquen PR-107 at Ramey Air Force Base Aguadilla, PR 00604	FINDS, ECHO	This facility has been issued a NPDES permit that expires on February 15, 2022. No violations reported as of July 2016. Facility is tracked in the ICIS-AIR system pursuant to the CAA.
4	Tick Eradication Program Substation Road #110, KM. 10.0 Ramey Air Force Base, PR 00604	SEMS-ARCHIVE	Site does not qualify for the NPL based on existing information.
5	Mayne Pharma Inc 1071 Parallel Road - Ramey Base Aguadilla, PR 00604	RCRA-CESQG, FINDS, ECHO	Registered as a CEQSG[1] of hazardous waste under the RCRA as of 2008. Wastes historically generated have included ignitable hazardous wastes (D001), corrosive hazardous wastes (D002), reactive hazardous wastes (D003), barium (D005), mercury (D009), silver (D011), benzene (D018), methyl ethyl ketone (D035), pyridine (D038), spent non-halogen solvents (F003), potassium cyanide (P098), hydrogen sulfide (U135), phenol (U188), chromium (D007), lead (D008), carbon tetrachloride (D019), chloroform (D022). Violation notices for this facility were received in 1986 and 1989. However, these violations have been resolved as of May 1989.
6	US Army Corps of Engineers 1089 Parallel Road - Ramey Air Base Aguadilla, PR 00604	FINDS, ECHO	Registered as a very small quantity generator[2] of hazardous waste under RCRA. No violations recorded as of July 2016.
7	U.P.R Col. Reg. Aguadilla Belt Road #252 Aguadilla, PR 00604	PR UST	Registered UST for diesel reported as permanently out of use.
8	V Mueller Del Caribe Inc Building 1132 Parallel Road RAM	FINDS, ECHO	Historically registered as a generator of hazardous waste under RCRA. Currently, facility

Map ID	Site Name	Database(s)	Description
	Aguadilla, PR 00604		is status is reported as inactive. No violations reported as of July 2016.
9	Ramey Caribe Gas Station Arch & Crown STS Aguadilla, PR 00604	FINDS	Registered in FINDS and ICIS as a Gasoline Service Station.
10	Coast Guard Air Station Borinquen Highway 107, Ramey Air Force Base Aguadilla, PR 00603	SEMS-ARCHIVE, RCRA-CESQG, NY MANIFEST, NJ MANIFEST	Site does not qualify for the NPL based on existing information. Registered as a CESQG[1] since 2008 for non-specified hazardous wastes under RCRA. Violation notices for this facility were received in 1988. However, these violations have been resolved as of May 1988. Manifest tracked transport of hazardous wastes in 1991, 2007, and 2008.
11	Awilda Nieves Real Estate 115 Belt Street, Ramey Base Aguadilla, PR 00603	FINDS	Registered in FINDS and ICIS.
12	UPR - Aguadilla Campus PR-2 KKM 130 (Belt Street Ramey Base) Aguadilla, PR 00603	FINDS	Registered in FINDS and ICIS.
13	DSC Puerto Rico Inc ST A Lot 8 Aguadilla, PR 00603	FINDS, ECHO	Facility tracked in RCRA information system. No violations reported as of July 2016.
14	Cortes Service Center PR-110 KM 0.8 Aguadilla, PR 00603	FINDS	Registered in FINDS and ICIS.
15	Mo-ka Shoe Corp Borinquen Road Aguadilla, PR	RCRAInfo	Registered as a hazardous waste generator. No violations have been reported.
16	MRO Apron Area at Rafael Hernandez Airport San Antonio Road, Former Ramey Air Force Base Aguadilla, PR	NPDES	Minor NPDES permit for stormwater discharge issued in September 2017 that expires in February 2022. No violations reported.
N/A	Ramey Air Force Base	FUDS, DoD	The US Government acquired the property comprised of 4,357.33 acres between 1939 and 1963 and utilized the property as a fully operational Air Force base until its deactivation in 1973. On March 1, 1974, ownership of most of the property was transferred to the Puerto Rican Industrial Development Company. Since March 1974, there have been numerous transfers of land parcels between US Government agencies, between the Government and private companies, and between the Government and local government agencies. The former base

Map ID	Site Name	Database(s)	Description
			property is currently occupied by the PRPA, the Puerto Rico National Guard, US Customs, USCG, educational facilities, several privately-owned businesses, and residential properties. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance) and therefore, may present an explosive hazard.
N/A	Ramey Solar Observatory Carr 110 KM 7.7	PR LUST	Facility has reported LUST incidents. Additional information not available. Location not specified.
N/A	US Immigration and Naturalization 722 Belt Road	PR LUST	Facility has reported LUST incidents. Additional information not available. Location not specified.
N/A	Former Ramey Air Force Base US Naval Station Roosevelt Roads Aguadilla, PR	PR LUST	Facility has reported LUST incidents. Additional information not available. Location not specified.

Source: EDR, 2019; individual databases as noted; EPA Envirofacts Database, 2019.
Notes: Records in red occur directly in the DSA or within 150 feet of the DSA. N/A = Not Applicable
[1] Conditionally exempt signifies that the facility generates 100 kg or less of hazardous waste per calendar month, accumulates 1,000 kg or less of hazardous waste at any time, and/or generates or accumulates less than 1 kg of acutely hazardous waste per calendar month.
[2] Generates 100 kg or less of hazardous waste per calendar month, accumulates 1,000 kg or less of hazardous waste at any time.

In general terms, solid wastes and hazardous materials generated during the construction phase of any project would be handled in accordance with all applicable Federal, state and local regulations. Construction waste not diverted, recycled, or re-used would be transported to and disposed of in local permitted construction/demolition facilities or in local waste-to-energy plants in accordance with applicable state and local requirements. Construction contractor(s) would be required to implement pollution prevention, spill prevention, and response plans documenting the measures that will be taken to prevent accidental releases to the environment and, should they occur, the actions that will be undertaken to minimize the environmental impact. In addition, new aviation-related tenants would, in most cases, be required to implement site-specific pollution prevention plans (i.e., Spill Prevention Control and Countermeasures Plan [SPCC]) that reduce the potential for substantial impacts associated with regulated materials.

Based on review of available environmental records and historical aerial photography, a vast majority of environmental contamination events or compliance issues documented at BQN are historical or otherwise minor in nature. No sites on or around BQN are listed on the NPL of contaminated sites. Overall, the potential for contaminated site involvement during the construction or implementation of either Alternative 2B or 2D is generally low. As indicated in **Table 4.6-1**, the former Ramey Air Force Base, the site of BQN, is listed as a FUDS. FUDS represent unique hazards such as the potential to encounter unexploded munitions and ordnances and low-level radiological hazards. Construction would will be conducted in accordance with guidance for FUDS construction activities provided by Federal Agencies,

including USACE Interim Risk Management procedures[14] and FUDS Interim Risk Management Notification and Safety Education Initiative[15].

Demolition and construction activities associated with Alternatives 2B and 2D would result in minor, short-term increases in the volume of hazardous and solid waste generated at BQN. Structures that would be demolished that were built before 1978 could potentially contain asbestos-containing materials (ACM) and lead-based paint (LBP). In February 2018, AECOM Caribe, LLP surveyed the buildings scheduled to be demolished to determine the presence of suspect ACM and LBP (see **Appendix F.2**). The surveyed structures were identified as Building 1000 and a guardhouse; Building 1029 and an herbicides storage room; Building 1070, Building 1089 (Airport old Control Tower); Building 1071 and related utilities; Building 1128 and various utility structures; Building 1120 (former fuel storage station); Building 2000, and Building 1251. Two other buildings identified as Buildings 1129 and 1132 were evaluated by the subcontractor CMC Environmental Consultants. LBP was detected in the following structures: Buildings 1000, 1029, 1070, 1071, 1089, 1128, 1251 and 2000. No LBP was detected in Building 1120. ACMs were detected in the following structures: Buildings 1000, 1029, 1071, 1128, 1251, 2000, and 1120. No ACM was detected in Buildings 1070 and 1089. According to the mentioned findings, LBP and ACM abatement activities are recommended at the evaluated buildings prior to the start of any demolition activity on the site.[16] A summary of anticipated demolition solid waste quantities from Alternatives 2B and 2D is provided in **Table 4.6-2**.

Table 4.6-2 Estimated Demolition Debris from Alternatives 2B and 2D

Debris Type	Debris Total (Cubic Yards)	
	Alternative 2B	Alternative 2D
Concrete	161,140	160,002
Wood Products	3,437	3,437
Drywall and Plasters	1,213	1,213
Steel	401	401
Brick & Clay Tile	1,130	1,130
Asphalt Shingles	1,207	1,207
AC	115,095	114,242
Total	**283,624**	**281,633**

Source: Construction and Demolition Debris Generation in the US, 2014; EPA Office of Resource Conservation and Recovery, December 2016; Debris Estimating Field Guide Federal Emergency Management Agency (FEMA) 329, Federal Emergency Management Agency, September 2010.

[14] https://www.usace.army.mil/missions/environmental/formerly-used-defense-sites/
[15] https://www.usace.army.mil/Missions/Environmental/Formerly-Used-Defense-Sites/FUDS-Notification-and-Safety-Education-Initiative/
[16] AECOM Caribe, LLP. *Limited Lead-Based Paint and Asbestos-Containing Material Survey for Vacant Structures to be Demolished, Rafael Hernandez Airport, Aguadilla, PR.* June 2018.

Removal of existing ACM and LBP would result in a long-term beneficial impact on waste management, by removing regulated materials that could otherwise be impacted by ongoing repair and maintenance activities on the affected buildings.

Solid waste facilities and landfills in Puerto Rico face serious challenges, especially after the massive debris generated from Hurricane Maria. Even before the massive cleanup effort required after the hurricane, the majority of Puerto Rico's operating landfills were beyond capacity. EPA began its direct involvement to address Puerto Rico's landfills in 2002 and continues to work closely with the EQB. In Puerto Rico, EPA focuses on the closure of open dumps (i.e., long-term, non-complying landfills) to protect human health and the environment; implementing recycling; GHG reductions via landfill gas collection, control, and energy recovery; and improving operations in existing landfills. While available waste disposal facility capacity is constrained, recent reports indicate that Puerto Rico retains sufficient EPA-compliant landfill capacity to accept the relatively minor amount of solid waste that would be generated by construction of the Proposed Project. Although the Aguadilla Landfill has been closed due to EPA Consent Decree, new cell construction at landfills in the adjoining municipalities of Isabella and Moca are planned starting in 2020 and would provide additional capacity for waste materials generated by the Proposed Project [17,18]

Based on the foregoing discussion, Alternatives 2B and 2D would not generate a considerable or appreciable amount of hazardous materials or solid waste that would violate applicable regulations or exceed available handling capacity.

No-Action Alternative

Under the No-Action Alternative, there would be no increase in the presence or risk of hazardous materials or waste and no new hazardous waste or material would be generated.

4.6.2.2. Operational Impacts

The use of fuel, and other regulated substances necessary for routine operations at the Airport will continue and will increase to correspond to the forecast growth in operations at the Airport and development of either Alternative 2B or 2D.

The amount of waste generation at BQN would not substantially increase with the implementation of either Alternative 2B or 2D and in conjunction with area recycling activities, would not significantly impact the capacity of the Aguadilla municipality solid waste management systems.

A new or revised NPDES permit may be required due to the relocation of Runway 8-26 and the addition of impervious surfaces. PRPA will be required to obtain any needed permit or permit modification prior to construction activities.

[17] EPA. *EPA's Work to Address Puerto Rico Landfills*. EPA Region 2. September 2016.
[18] Waste 360. *Puerto Rico Landfills: Is the Problem Around Capacity or Noncompliance?* August 7, 2019.

No-Action Alternative

Under No-Action Alternative, there would be no increase in the presence or risk of hazardous materials or waste and no new hazardous waste or material would be generated.

4.6.2.3. Avoidance, Minimization and Mitigation Measures

The Proposed Project and its retained alternatives are not anticipated to result in a change in the quantity or type of hazardous materials used and stored on site or in significant hazardous material impacts. Therefore, mitigation measures are not warranted and have not been developed by the Airport Sponsor for this EA.

In the event that existing clean-up sites or previously unknown contaminants are discovered during construction activities, or a spill occurs during construction, construction contract provisions would specify that work would stop until the National Response Center is notified. Depending on the parameters of potential soil contamination, the soil could be reused on-site. If the soil could not be used on-site, the soil would be manifested and transported off-site to an authorized disposal facility.

Entities participating in the storage, use, transportation, and disposal of hazardous materials at BQN would be required to prepare a SPCC documenting the measures that have been taken to prevent accidental release to the environment and, should they occur, the corrective actions that are in place to minimize the environmental impacts

4.7. HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

4.7.1. AFFECTED ENVIRONMENT

Section 106 of the NHPA of 1966 (16 U.S.C. 470f) requires that Federal agencies take into account the effect of their undertakings on any site that is included on or eligible for inclusion on the NRHP, and implementing regulations published at 36 CFR 800 define the measures to be implemented to attempt to identify and mitigate impacts to such historic properties. The Section 106 process consists of four steps: 1) Initiate the Section 106 Process; 2) Identify Historic Properties; 3) Assess Adverse Effects; and 4) Resolve Adverse Effects.

An archaeological and historical literature and background information search pertinent to the project APE was conducted to determine the types, chronology, and locations of previously recorded cultural resources and studies within or near the APE. This included an appraisal of area physiographic and soils information, as well as a search of the PRSHPO cultural resource files, historic photos, the 2004 Historic and Architectural Resources Survey and Evaluation of the USCG Station Borinquen in Aguadilla, Puerto Rico[19] (which partially overlaps the former Ramey

[19] MWH Americas, Inc. *US Coast Guard Air Station Borinquen Aguadilla, Puerto Rico, Historic and Architectural Resources Survey and Evaluation*. Prepared for US Coast Guard. 2004.

Air Force Base/current BQN location), a 2014 Phase IA and IB study at BQN on behalf of Federal Emergency Management Agency (FEMA)[20], US Geological Survey Historical Topographic Map Explorer[21], and NRHP nomination forms.

The APE is located within the Northern Karst province in the northwestern portion of Puerto Rico. This physiographic region is characterized by the dissolution of limestone and has resulted in a belt of karst topography 15-23 kilometer (km) (9.3 to 14.3 miles) wide and about 135 km (83.8 miles) long. Typical of karst topography, the majority of drainage is underground and features relatively few through-flowing rivers and tributaries. Approximately 800 meters (0.5 miles) to the south of BQN, Canal Aguadilla, a man-made feature, acts as the principal drainage surrounding the APE. The canal drains westerly approximately 2.19 km (1.36 miles) towards Borinquen and then to the Atlantic Ocean near Punta Borinquen. The elevation within the project area generally ranges from 200-250 feet above mean sea level. NRCS soils data are not available for the entirety of the APE; therefore, soils data comprising a one-mile radius around the APE were used to interpret soils information for the APE. Eight distinct soil types are identified within the APE. With the exception of limestone outcrops, the soil types in the survey area are considered moderately well drained to well drained.

Examination of the PRSHPO cultural resource files indicated that no currently NRHP-listed or archaeological sites are present within the APE or within a one-mile (0.8 km) radius of the APE. The closest recorded sites to the APE are located 2.4 km (1.5 miles) to the west-southwest of the APE. These sites are the Borinquen Lighthouse (AL0100001) and Antiguo Fara Espanol (AL0100005). The 2004 survey of the USCG Station in Borinquen identified 201 architectural resources constructed between 1939 and 1990, dating from the time Air Station Borinquen was established to the end of the Cold War. However, this survey excluded most of the BQN property, which lies outside of the USCG ownership. Within the APE, Building 402 (old Flight Hangar 2) was individually eligible for listing in the NRHP. The 2014 Phase IA and IB study at BQN further identified a potentially historic hangar (currently Building PR4043, formerly Building 575), which was associated with the SAC dispersal program that brought B-52 bombers to Ramey Air Force Base. However, the survey found that the building had been substantially altered and did not retain integrity and was therefore ineligible for NRHP listing. A 2020 historic architecture survey investigated 199 individual potential resources across six geographic subareas within the APE.

BQN has been in operation since 1939 (originally as Borinquen Field during World War II, and later as Ramey Air Force Base during the Cold War) and many ground-disturbing operations have occurred during its time of operation. Ground-disturbing activities also occurred prior to construction of the Base and Airport, due to extensive agricultural use as sugar cane plantations. The Cultural Resources Assessment Survey (CRAS) report included as **Appendix G** revealed that the majority of the project area has been subjected to significant grading and other ground-disturbing activities related to the rapid construction of the airport property associated with World

[20] Marti, Armando J. *Draft Structural and Cultural Resources Survey for CBP OAM New Maintenance Hanger and Administrative Building, Aguadilla, PR*. Prepared for FEMA. 2013.

[21] USGS Historical Topographic Map Explorer. http://historicalmaps.arcgis.com/usgs/

War II operations. Areas of disturbed soil were consistently encountered within the project area during the survey efforts. The majority of the APE exists within or adjacent to runways, associated runway drainage systems, paved and unpaved roads, parking, storage, and buried utilities. The main Airport property has been cleared of vegetation; however, there are also unmaintained areas overgrown with shrubs and small trees. Numerous test pits revealed evidence of repeated fill events.

Of the 199 individual resources surveyed, three individual resources were identified in the CRAS as eligible for the NRHP. Each of the three eligible individual resources was included within a single potentially historic district. The remaining resources were deemed ineligible for NRHP inclusion for a variety of reasons. The most common reasons for individual resource ineligibility were the loss of integrity of design, materials, workmanship, feeling, and association due to numerous changes to the structures. While some potentially historic districts and individual resources retained their overall integrity, they failed to meet any of the NRHP eligibility criteria[22] as stated below:

- Criterion A. Associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B. Associated with the lives of significant persons in the past;
- Criterion C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D. Have yielded or may be likely to yield, information important in history or prehistory.

FAA initiated consultation with the PRSHPO and the Advisory Council on Historic Preservation (ACHP) to satisfy requirements of Section 106 of the NHPA for the Proposed Project. The basis for consultation is the CRAS prepared for the Proposed Project (**Appendix G**), as well as two previous reports prepared in 2015 and 2016. As an outcome of the identification efforts presented by FAA, the PRSHPO concluded that BQN, formerly Ramey Air Force Base, constitutes a historic district eligible for inclusion to the NRHP, and that all structures originally constructed as part of the base, including the structures to be demolished south of the proposed runway reconstruction location and the existing Runway 8-26, are considered contributing resources to the district's eligibility. **Table 4.7-1** summarizes the individual resources assessed within the APE for the Proposed Project. Refer back to **Figure 4.5-1** for a location map of these features.

[22] National Register Bulletin. *How to Apply the National Register Criteria for Evaluation*. 1997.

Table 4.7-1 Historic Architectural Resources in the APE

Area	Map ID (Figure 4.5-1)
Punta Borinquen Golf Course and Clubhouse (W of Borinquen Road)	R-001
Fullana Wherry Housing (NW of Golf Street and Borinquen Avenue)	H-054
Motor Pool and Supply Buildings (NE of Borinquen Avenue and Hangar Road)	H-033, H-034, H-035, H-036, H-037, H-038, H-039, H-040, H-041, H-042, H-043, H-044, H-045, H-046, H-047
Garages and Support Buildings (NW of Hangar and Wing Roads)	H-048, H-049, H-050, H-051, H-052
Borinquen Field Concrete Hangars and Control Tower (SW of Hangar and Wing Roads)	H-002, H-003, H-004, H-005
Cold War-era SAC Bomber Alert Facility (S and N of BQN Runway)	H-006, H-007, H-008. H-009, H-010, H-011, H-012, H-013, H-014, H-015, H-016, H-017, H-018, H-019, H-020, H-021, H-022, H-023, H-024, H-025, H-026, H-027
Material Storage and Fuel Tanks Resources (W and S of Former Taxiway 2)	H-028, H-029, H-030, H-031, H-032
Civilian War Housing (SE of Former Taxiway 2 and W of PR 110R)	H-053
Paul Revere Lodge No. 98 (Calle Villa Caribe)	N/A (not NRHP-eligible)
Runway 8-26 and associated pavements	H-001

Source: AECOM, 2020.

4.7.2. ENVIRONMENTAL CONSEQUENCES

The Proposed Project has been evaluated in compliance with Section 106 of the NHPA, which requires Federal agencies to consider the effects of their actions on properties that may be eligible for listing or are listed in the NRHP. The Section 106 process generally requires four steps: 1) initiation of the process through early coordination with the SHPO and other interested parties; 2) identification of cultural resources that are listed in or are eligible for listing in the NRHP; 3) assessment of the effects the project will have on eligible or listed properties; and 4) resolution of adverse effects in consultation with the SHPO and, if necessary, the AHCP. Resolution of adverse effects (e.g., avoidance/minimization/mitigation steps) is typically outlined in a MOA between the SHPO, Federal agency, and interested parties.

The methodology for identifying potential historic resources is that of 36 CFR 800.4, *Identification of Historic Properties*. The methodology for assessing the effects the Proposed Project might have on NRHP-listed or -eligible resources is that of 36 CFR 800.5, *Assessment of Adverse*

Effects. The methodology for providing a resolution for any such adverse effects is that of 36 CFR 800.6, *Resolution of Adverse Effects.*

As indicated in **Section 4.7.1**, a Phase I CRAS was conducted at BQN that included background research and field surveys (see **Appendix G**). The historic architecture and archaeological field surveys were performed from December 16-19, 2019. The archaeological field investigations identified no positive recoveries of potential archaeologically significant artifacts, including in areas that were previously surveyed by others in support of ongoing identification efforts at BQN.

As discussed in **Section 4.7.1**, the analyses performed for the CRAS indicated that none of the buildings that would be demolished as part of Alternative 2B or 2D are eligible for listing to the NRHP. Three individual resources were found to contribute to a potential historic district; however, due to most of the buildings being substantially altered and none of them being rare resource types nor satisfying NRHP criteria, neither the district nor the individual resources would be eligible for the NRHP.

However, during Section 106 consultation, the PRSHPO indicated that it considers all existing structures associated with the former Ramey Air Force Base to be contributing resources to the NRHP-eligible Ramey Air Force Base Historic District, and that the Proposed Project adversely effects individual resources. This includes 16 of the 21 structures that would be demolished as a result of the Proposed Project, located to the south of the proposed Runway 8-26 reconstruction location. These buildings were part of the Cold War-era SAC Bomber Alert Facility. The facility was designed to speed crews, planes, and nuclear weapons into the air within 15 minutes of an alert sounding. This required putting necessary facilities, including crew quarters, next to the planes.

Additionally, PRSHPO concluded that Runway 8-26 constitutes a resource contributing to the Historic District, as roughly 66% of the existing runway is comprised of pavements emplaced for the original runway at Borinquen Field or Ramey Air Force Base. The PRSHPO further concluded that reconfiguration of the runway to serve as a taxiway would result in an adverse impact to an NRHP-eligible resource.

In total, PRSHPO concluded that the Proposed Project would result in adverse effects to 17 historic resources that contribute to the Ramey Air Force Base Historic District: 16 individual buildings located in the Cold War-era SAC Bomber Alert Facility (south of the proposed Runway 8-26 reconstruction location), and Runway 8-26. FAA subsequently notified ACHP of the finding of adverse impact. In a letter dated June 22, 2020, ACHP stated that its involvement in the consultation processes was completed with the notification. **Table 4.7-2** depicts the structures proposed for demolition or alteration along with their descriptions, CRAS findings, and the PRSHPO findings.

Table 4.7-2 Structures Proposed for Demolition or Alteration

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
H-026	Building 1251-Target Intelligence	Between 1956 and 1959	Two one-story rectangles of different depths that form a flush elevation on the south-facing facade. The section on the west is deeper than the one on the east. Stuccoed concrete block topped by a flat roof with overhanging eaves forms the building. Plain concrete pilasters regularly spaced along the elevations, divided by a narrower, horizontal, beltcourse-like projection. Windows of western and eastern sections have been mostly walled in, but for small glass-block-filled bays set above the beltcourse. A projecting covered entry bay to the building's front is an early or original feature. A longer one to the north may have been added after the military left. Interior is currently a large open space containing numerous heavy-duty, floor-to-ceiling, storage racks.	Original location. Retains some of its original setting but appears to have lost its integrity through the blocking up of large portions of its windows and the gutting of its interior. Original functions are no longer apparent due to interior changes. Has lost its integrity of design, materials, workmanship, feeling, and association. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-025	Building 1245 - Readiness Crew Facility	Late 1950s	Long, one-story, rectangular, concrete-block building. Regularly spaced, concrete pilasters cross the north-facing central third of the building. In front of pilasters are slender columns forming a portico that supports a flat porch roof set lower than the building's principal, flat, concrete roof. Central section of the facade had long window bays now walled in. The eastern	Original location. Retains some of its original setting, but otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association through the blocking up of its windows and the removal of most of its interior walls. Original function difficult to ascertain, given surviving structural elements. Does not	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			and western thirds of the facade appears to have always lacked windows. Vestibules with side doors project from the centers of the eastern and western sections. Central section of interior is a large open space with exposed structural columns running down its center. Eastern and western sections are broken up into small rooms, historically for crews. The south-facing vestibules at each section open into a central corridor. To either side of each corridor are six or eight small rooms. The western and eastern sections of the building are windowless. Half-story extensions, apparently for air conditioning units project above each of the four bathrooms.	possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	
H-006	Building 3 - Gazebo	1960s	Heavily overgrown remains of what may have been a gazebo or picnic shelter stand in a roughly rectangular area of ground that 1964 and 1968 base maps identify as the “alert force picnic area.” The former structure retains portions of ten concrete-block posts spaced to form a rectangle. Its concrete floor slab remains in place, but its roof is gone.	Original location. Retains some of its setting, but its integrity appears to have been lost through the loss its roof and damage to its posts. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
H-020	Building 1104 - Storage and Supply	Late 1950s	One-story tall and built of concrete block, shaped like a comb with four widely spaced teeth. Its long east rear and shorter south and east side elevations are of solid concrete block, but for groups of tripled ventilation holes beneath its flat, overhanging, concrete roof. West-facing elevation has four protruding sections finished on their west like the other elevations. They embrace three U-shaped recesses that are lined with concrete shelves. Shelving is exposed, but remains of wooden frames suggest they were originally enclosed by wooden doors.	Original location. Retains some of its original setting. Has lost the many wooden doors that once protected the contents of its storage shelves. Due to their absence, much of its integrity of design, materials, workmanship, feeling, and association has been lost. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-014	Building 1132 - Squadron Operations	Late 1950s	Building is long and rectangular with extensions at each of its elevations. Built of plastered concrete blocks and topped by a flat concrete roof. Retains a few long window bays; others have been blocked in. Extended from its west side elevation is a round-edged addition of one story with an apparent second story that is actually parapet walls without an upper roof. Building has been extended by flat-roofed, one-story additions on the north and south elevations. A loading dock has been added to its east. Changes were made by the pharmaceutical company that took it over as a	Original location. Retains some of its original setting, but appears to have lost its integrity of design, materials, workmanship, feeling, and association through the enclosure of most of its windows, the construction of extensions on all four of its elevations, and the near complete reworking and partitioning of its interior. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			manufacturing facility and extensively reworked the interior.		
N/A (not NRHP-eligible)	Building 6 - Guard House	Mid-1970s	Built of concrete and topped by a widely overhanging flat roof. Has a guard room on the north facing a former road with windows looking north, east, and west. A bathroom is contained in its southeastern corner.	Less than 50 years old and not of exceptional importance. *Demolition results in no adverse effect to historic property.*	*Building is not a contributing resource to Ramey Air Force Base Historic District.* *Demolition results in no adverse effect to historic property.*
H-021	Building 1121 - Electrical Station	Late 1950s	Heavily overgrown, has wires down on it from utility poles, and could not be carefully viewed or approached. Description based primarily on historical research. Small, rectangular, concrete-block building with concrete beams and a concrete slab roof. South rear and east and west side elevations are described as having windows. These are glass on the south elevation and "contemporary, Miami style, aluminum louvered windows" on the south. The front (north-facing) elevation, which could be partially viewed as part of the current survey, has a single metal door and no windows.	Original location. Retains some of its original setting. Appears to have lost much of its integrity of design, materials, workmanship, feeling, and association through the replacement of windows and likely the north entry door as well. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-024	Building 1133 - Captive Water Supply Tank Building	Late 1950s	Vacant and heavily overgrown, has wires down on it from utility poles, and could not be carefully viewed or approached along its north elevation. Description based primarily on historical research. Small, rectangular, concrete-block building with concrete beams and a concrete slab roof, similar to	Original location and retains some of its original setting. Appears to have lost some of its integrity of design, materials, workmanship, feeling, and association through the replacement of two windows. Does not possess sufficient integrity to support any historic,	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			Building 1120 just to its west. The north elevation is open, overlooking a 12'-diameter tank as long as the building. The west elevation has "Miami aluminum louver style" windows that are not original. The east elevation has no windows.	associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	
N/A (not NRHP-eligible)	Building 9 - Water Storage Building	Post-1968	Small concrete-block building topped by a flat concrete roof with overhanging eaves. Surrounded by a concrete-block wall and chain-link or cyclone fencing that extends to the north, encompassing two fiberglass water tanks that are exposed to the elements. Metal pipe railings extend over the tanks.	Less than 50 years and not of exceptional importance. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-022	Building 1128 - Armaments and Avionics Shop	Late 1950s (northern third). 1970-1980s (southern two-thirds)	Vacant and greatly deteriorated. Original rectangular rear block is one-story tall. Built of concrete block with concrete columns and topped by a flat overhanging concrete roof. The rear block historically featured long windows, many of which have been filled in. The later southern two-thirds of the building has concrete-block walls with no windows. Steel I-beams form the building's structural body. Two wide entryways with shielding eaves face south. A rectangular, one-story, flat-roofed, concrete addition—also post-1970s—projects to the building's west. The building is heavily overgrown	Building has been added to and heavily altered. Approximately two-thirds of it was built less than 50 years and is not of exceptional importance. Original location and retains some of its setting, but otherwise appears to have lost its integrity of design, materials, workmanship, feeling, and association. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			and was deemed unsafe to enter, so it is unclear how extensively the interior of its original block was altered. Former pharmaceutical company tenant likely altered building interior to suit its industrial needs.		
N/A (not NRHP-eligible)	Building 11 - Boiler Building	Post-military, Presumed Late 1970s.	Long tall building apparently built to hold boilers and other heavy equipment, all of which have been removed. Concrete construction with additional I-beam support. Topped by a corrugated-metal shed roof, which slopes to the south. Five nearly full-height openings cross its south elevation. Three are divided two-thirds of the way up by cross beams. Portions of the floor of a second or mezzanine level have been cut away to facilitate the removal of the boilers and other equipment. Several doors and windows located on the east and west sides and north elevations. Various pipes and other equipment-related openings mark the north elevation and, particularly, the roof.	Less than 50 years and not of exceptional importance. *Demolition results in no adverse effect to historic property.*	Building is not a contributing resource to Ramey Air Force Base Historic District. *Demolition results in no adverse effect to historic property.*
N/A (not NRHP-eligible)	Building 13 - Guard House	1975	Fully engulfed in overgrown vegetation. Made of concrete with a concrete roof slab. Square configuration with its southeast corner chamfered. It has an entrance and a window on its east facade. Other windows are in the south and west facades. Not	Less than 50 years and not of exceptional importance. *Demolition results in no adverse effect to historic property.*	Building is not a contributing resource to the Ramey Air Force Base Historic District.

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			accessible due to a locked gate blocking its entrance. Contemporary auxiliary building.		*Demolition results in no adverse effect to historic property.*
H-023	Building 1129 - Armaments and Electrical Shop	Between 1956 and 1959	Most of the core first story of this long building is original, if heavily altered, construction Appears to be built of concrete block, but much of its original wall surface is hidden by circa-1975 extensions along its west side and south-facing elevations and at its northwest corner. The additions, likely of concrete block, are fitted out with modern, single-light windows. Includes later addition of a partial second story on the south—some of the bays of which are empty or filled in—and the construction of a metal platform over the body of the remaining part of the building. Platform supports a complex web of oversized pipes, ducts, and machinery that were central to the manufacture of pharmaceuticals. The building was not entered during current survey due to industrial hazards, but previous investigations report: "Its interior is full of industrial wastes, which include a large number of vials full of unknown chemicals. Building materials dangle everywhere. Most rooms have no windows and signs reveal the possibility of that hazardous materials were handled when last in use"	Original location. Some of its setting in intact. Appears to have lost its integrity of design, materials, workmanship, feeling, and association through its many additions and reworkings, which obscure its original appearance and functions. No historic, associational, or architectural significance. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
N/A (not NRHP-eligible)	Building 15 - Electrical Station	2004 or 2005	Building is small and rectangular. Flat concrete roof with a wide overhang tops its concrete-block walls. The south elevation retains glass windows. Window bays on the east and west side elevations contain louvers. The large aboveground water storage tank to the north is built of metal, rusting at the seams, and topped by a low conical roof. A metal cage frames a ladder that still climbs its west-facing section.	Building and tank are less than 50 years and not of exceptional importance. *Demolition results in no adverse effect to historic property.*	Building and tank are not contributing resources to the Ramey Air Force Base Historic District. *Demolition results in no adverse effect to historic property.*
H-016	Building 1071 - Squadron Operations	Between 1956 and 1959	One-story tall with concrete-block walls, concrete piers that project forward as pilasters, and a flat concrete roof. Many if not all of its windows appear to have been modernized, likely in the late 1970s when it was converted to terminal use. Some window bays may retain their original aluminum frames or were replaced by similar frames. An extension at the building's eastern end likely made when the terminal took over the building. Its north face, looking toward the runway, contains an entry set in floor-to-ceiling glass. An open concrete-block wall on the western end of the north elevation appears to have been built to screen a luggage or cargo loading area. The interior appears to have been altered to accommodate terminal use.	Original location. Retains some of its setting. Appears to have lost its integrity of design, materials, workmanship, feeling, and association through the replacement of windows, changes to bays, an addition, and reconfiguring for use as the airport's terminal. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
H-019	Building 1089 - Weather Observation Tower	Between 1956 and 1959	Building consists of a one-story base with a glass-filled cab above. The nearly square base is built of concrete blocks with concrete corner posts. South elevation holds a boarded-up bay that has lost its original window glass. East elevation has no bays. The north once held a window bay, evidenced by a plain projecting concrete sill, that has been blocked in. On the west is an off-center door that has been replaced. A metal stair climbs in a single run to a landing above that door. Pipe railings at the stair have been altered at least where they attach at the landing. The landing continues around the north, east, and west sides of the cab as a narrow pipe-railed balcony. From the landing, a glass door leads into the cab, which has nearly floor-to-ceiling glass windows. All four elevations slant outward and each elevation has a central window with a large light at the top and a narrower one at the bottom. Flanking the two-part windows are windows with a single full-height light and the glass entry. Aluminum frames all of the windows and the entry. The interior, which has been stripped of its equipment, retains some desks and cabinets that are not	Original location. Retains some of its setting. Appears to have lost some of integrity of design, materials, workmanship, feeling, and association through the blocking in of a window, replacement of a door, and some alteration to its stair railings. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			original to the building. A flat roof tops the cab.		
H-015	Building 1070 - Aircraft Maintenance Organizational Shop	Between 1956 and 1959	One-story tall and built of concrete blocks covered in plaster. Concrete pilasters that are also beams are spaced regularly across its elevations. A flat overhanging concrete roof covers it. It was once lit by long window bays, but all the original windows are gone, their bays either completely blocked or reduced to relatively small, glass-block-filled openings tucked beneath the eaves. The surviving metal doors are not original. A doorway on the north elevation has been blocked in. A one-bay addition extends along the length of the building's east side elevation.	Original location and retains some of integrity of setting. Appears to have lost its integrity of design, materials, workmanship, feeling, and association through the blocking in, or almost complete blocking in, of all of its windows bays, the loss of its original windows and doors, and the addition of an ell on its east side. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-012	Building 1029 - Ground Support Equipment Shop	Between 1956 and 1959	Rectangular core of building is one-story tall and built of concrete block that has been plastered. Concrete beams project as pilasters along its elevations. It has three slightly recessed panels across its north and south elevations and five recesses along its longer east and west side elevations. A concrete-block band level with the pilasters rings the building. Tall sets of louvers in the right and left panels at the north elevation—the central panel holds a garage door—and in the	Original location and retains much of its setting. Has been little altered and therefore appears to retain much of its integrity of design, materials, workmanship, feeling, and association. However, the building was a functional airbase shop and has no historic, associational, or architectural significance. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			three northern panels on the side elevations. They are underpinned with a projecting concrete band or beltcourse and topped by an additional row of narrow, concrete-block-filled recessed panels that appear to be original. Central panel holds a garage door and the panels to either side have a band of three narrow louvered openings that extend out into another set of three louvers on low wings that project to the side. The south louvers are shaded by wide overhanging eaves, which mark both wings. Interior of the main block is a straightforward utilitarian space with exposed metal trusses and concrete block. The interiors of the wings were not accessible.		
H-013	Building 1031 - Electric Power Station	Late 1950s	Building is nearly square and one-story tall. A flat roof tops its concrete-block walls. South-facing elevation holds a replacement door and an eight-light casement window that may be original. Two large bays at the east have been blocked over, but for some large later louvers added at their tops. A smaller bay on the north has been fully enclosed by concrete block. The west elevation, largely screened by a shed of sheet metal and chain-link fencing, has no openings. Inside, two concrete	Original location and retains some of its original setting. Appears to have lost its integrity of design, materials, workmanship, feeling, and association, though, through the enclosure of most of its bays, the addition of louvers, and the replacement of a door. Does not possess sufficient integrity to support any historic, associational, or architectural significance it might have. Unlikely to yield important historic information.	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			pads likely once held generators or other equipment.	*Demolition results in no adverse effect to historic property.*	
H-017	Building 1072 - Weapons and Base Systems Shop	Between 1956 and 1959	Tall, one-story, concrete-block building with a nearly flat roof with no overhangs. Three large garage bays, only one with a door, open from its south-facing front elevation. The space that could have held a fourth bay, but apparently never did, has three smaller entry bays with topped by a single empty window bay. North elevation only has two garage bays, both retain their doors. One partially intact casement window is set high near its western edge. Two metal doors and two upper casement windows, painted over, mark the west side elevation; similar windows bays, but no doors, at the east elevation have largely lost their casement windows. Building's interior has functional exposed concrete-block walls; spaces that could be viewed are littered with old computer and mechanical equipment, plastic pipes, bricks, and other odds and ends.	Original location. Appears to have lost its integrity of design, materials, workmanship, feeling, and association through alterations to and/or loss of garage doors, windows, and doors *Demolition results in no adverse effect to historic property.*	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse effect to historic property.*
H-018	Building 1073 - Traffic Check House	Between 1956 and 1959	Small nearly square building built of concrete block with a widely overhanging flat concrete roof. South front and north rear elevations each hold one door and one window. Single window bays pierce the side elevations. The aluminum frames of the	Original location. Retains some of its original setting. Although the glass in its window bays and the tops of its doors is broken, it appears to retain its integrity of design, materials, workmanship, feeling, and association. Has no historic, associational, or	Building is contributing resource to Ramey Air Force Base Historic District. *Building demolition results in adverse*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			casement windows suggest that they might be original. The inside is a single open space.	architectural significance. Unlikely to yield important historic information. *Demolition results in no adverse effect to historic property.*	*effect to historic property.*
H-026	Runway 8-26	Beginning in 1939	11,700 feet long by 200 feet wide with 50-foot shoulders. The center section of the runway between 2,000 feet and 8,000 feet is comprised of six to eight inches of PCC, with AC overlay with thicknesses varying between three and six inches. Runway construction at Borinquen field began immediately upon breaking ground at the airfield in 1939. Lengthened from 1941 to 1946. From 1957 to 1959 it was extended and widened, in order to accommodate the B-52 heavy bomber aircraft. A partial length 1.5-inch asphalt overlay was applied in 1971 before Ramey Air Force Base was closed in 1972 . Since initial construction and widening, relatively small portions of the runway have undergone various repairs and rehabilitations. Roughly 66% of the runway (approximately 6,188,971 square feet of the of the 9,348,881 total square feet) has not undergone any pavement repair or maintenance in 50 or more years . This indicates that at least two-thirds of the runway are	Original location and retains much of its setting, framed by buildings erected by the Army and Air Force during WWII and the Cold War. Appears to have lost much its integrity of design, materials, workmanship, feeling, and association due to numerous extensions, rebuilding, and other changes. Not believed to possess sufficient integrity to support any historic, associational, or architectural significance it might have, is unlikely to yield important historic information. *Alteration results in no adverse effect to historic property.*	Runway is a contributing resource to the Ramey Air Force Base Historic District. *Reconfiguration of historic runway results in adverse effect to historic property.*

ID (Figure 4.5-1)	Structure Name	Date of Construction	Building Description	CRAS Appraisal*	PRSHPO Effects Determination
			comprised of materials that date back at least to Ramey Air Force Base.		

Notes: *An updated CRAS with revised findings will be produced in 2020, pursuant to a Memorandum of Understanding between FAA, PRPA, and PRSHPO, as described in **Section 4.7.2.1**.

Source: AECOM, 2020

No-Action Alternative

Under the No-Action Alternative, no buildings would be demolished, Runway 8-26 would retain its current use as a runway, and no ground disturbing activities would occur, and therefore there would be no impact to historical, architectural, archaeological, and cultural resources.

4.7.2.1. Avoidance, Minimization and Mitigation Measures

Should construction activities associated with the Proposed Project uncover any archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains.

In accordance with 36 CFR §800.6(b)(1) et seq, the FAA seeks to resolve adverse effects identified by the PRSHPO and described in **Section 4.7.2** of this EA by entering into a MOA with the PRSHPO and the PRPA. The MOA as drafted contains nine individual stipulations. The complete MOA is included in Appendix C of this EA. The stipulations are summarized briefly below:

Stipulation I: Archaeological Investigation

A single archaeological survey report will be prepared by PRPA that integrates the entirety of archaeological identification and evaluation work carried out in the 2015, 2018, and 2019 archaeological surveys, and will include all related letters by the SHPO, and an evaluation of eligibility with the basis for such recommendations. This single report will be submitted to the PRSHPO for review. If additional subsurface testing is deemed necessary, a work plan will be submitted to the PRSHPO for review and concurrence prior to implementation. FAA will obtain consensus determinations of eligibility, assessment of effects and resolution of effects from PRSHPO.

Stipulation II: Historical Site Documentation

PRPA will prepare a report to document the architectural and cultural history of the airfield to include history of the Airport's role during the Cold War; documentation of Ramey Air Force Base's role in the use of reconnaissance planes during the Cold War; oral histories from a locals' perspective in how the Air Force Base affected the economy of Puerto Rico; the role of Ramey Air Force Base as part of a SAC which will include the mission and history of the SAC and exploration of Ramey's contribution to this command; and discussion of Ramey Air Force Base's influence on life including education, employment, and people's views concerning the base.

Stipulation III: Permanent Archival Record

Prior to acquisition and demolition of buildings, digital photographs will be taken of the buildings and landscape within the APE including views of the exterior and interior of all buildings, structural or decorative. Digital photographs showing the overall complex and its setting will also be included.

Stipulation IV: Duration

The MOA shall expire if its terms are not carried out within five years from the date which the fully executed MOA is filed with ACHP. Prior to such time, FAA may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation VIII.

Stipulation V: Post-review Discoveries

If potential cultural resources are discovered or unanticipated effects on cultural resources found during design or construction, all work shall promptly stop and the FAA, PRPA, and PRSHPO will be notified and consulted on how to proceed pursuant to 36 CFR Part 800.13.

Stipulation VI: Monitoring and Reporting

Each year following the execution of the MOA until it expires or is terminated, the PRPA shall provide all parties to the MOA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the Sponsor's efforts to carry out the terms of the MOA.

Stipulation VII: Dispute Resolution

Provides a dispute resolution process, should any signatory to the MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented.

Stipulation VIII: Amendments

The MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

Stipulation IX: Termination

Provides a process for terminating the MOA, should any signatory determine that its terms will not or cannot be carried out. If the MOA is terminated, work shall stop on the undertaking. Prior to work continuing on the undertaking, FAA shall either (a) execute an MOA pursuant to 36 CFR § 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR § 800.7. FAA shall notify the signatories as to the course of action it will pursue.

4.8. NATURAL RESOURCES AND ENERGY SUPPLY

4.8.1. AFFECTED ENVIRONMENT

Potable water is supplied to the Airport by the Puerto Rico Aqueduct and Sewer Authority (PRASA) via the Ramey filtration plant. Capacity is reported as 3.0 million gallons per day (MGD), compared to an average demand of 2.0 MGD and a peak day demand of 2.5 MGD. The Airport's current water distribution system is connected to two 14-inch cast iron mains that serve the entire

property. Twelve-inch and eight-inch cast iron pipes branch out from the 14-inch mains to serve the north side of the Airport and adjacent areas, with a 12-inch pipe serving the buildings and an eight-inch pipe serving the fire hydrant system.

Wastewater disposal is provided to the Airport by sanitary sewer lines which run on the street in front of the property and connect to a trunk line that links the former base to the PRASA Aguadilla regional wastewater plant. The plant has a capacity of eight MGD and is currently receiving less than four MGD.

Electric service is provided by the Puerto Rico Electric Power Authority (PREPA). Three substations distributed around the Airport property provide most of the power. No power is generated on the property proper, except through occasional use of emergency generators. The distribution system consists of an overhead primary line of 4,160/2,400 volt with step-down transformers to a secondary voltage of 120/240 volt. A segment of the 4,160 volt line runs underground under the runway and airfield, from Hangar Road to Parallel Road. The system is a three wire Delta System. In addition to the overhead lines, there is also a 38 kilo-volt underground line located along Parallel Road and connecting to a substation located near the intersection of Parallel Road and PR 107. PREPA's power capacity for BQN is reported as 22,000 kilo-volt-ampere (kVA) versus an average demand of 7,000 kVA, and a peak demand of 7,500 kVA.

Commercial telephone service is provided to the Airport by the Puerto Rico Telephone Company. A main telephone station is located at the Airport behind the USCG facilities.[23]

BQN is located within Karst Zone Special Planning Area (APE-ZC, by its initials in Spanish). The APE-ZC was created by Puerto Rico Regulation No. 8486, which governs the protection and conservation of the karst physiography of Puerto Rico, including sinkholes. Activities in APE-ZC areas must be authorized under the appropriate conditions, complying with the required permits, endorsements and franchises required by applicable laws and regulations. All work required for the Proposed Project will be implemented in accordance with these requirements, including implementation of BMPs to avoid karst features and address possible soil instability.

A sinkhole is present on the airfield near the east end of Taxiway M. Pursuant to APE-ZC requirements, a geotechnical study of the Proposed Project area was performed in 2018[24] to determine stability of soils in the Proposed Project area, identify additional karst features, and identify areas of likely subsoil collapse due to karst features and subsurface dynamics. The study did not find evidence of additional karst features or karst-related soil instability within the Proposed Project area. Areas of unsuitable fill material were discovered and the study's report includes geotechnical recommendations to address these areas.

[23] US Customs and Border Protection. Final Environmental Assessment for New Hangar and Administrative Support Facility for US Customs and Border Protection, Office of Air and Marine, Aguadilla, Puerto Rico. July 2014.
[24] *Report for the Preliminary Subsurface Exploration (Geophysical (GPR) & Borings) and Geotechnical Engineering Assessments for the Proposed New Runway Project at Rafael Hernández International Airport (BQN) on Maleza Baja to Maleza Alta Wards of the Municipality of Aguadilla, Puerto Rico*. Despiau Associates Consulting Geotechnical Engineers for AECOM Caribe, LLC. September 18, 2018.

4.8.2. ENVIRONMENTAL CONSEQUENCES

FAA Order 1050.1F identifies a significant impact on natural resources and energy supply "[w]hen an action's construction, operation or maintenance would cause demands that would exceed available or future (project years) natural resources or energy supplies". To the end of determining impact significance, the Proposed Project was considered in the following contexts:

- **Utility Impacts**: identify any large demand on local existing or planned utilities;
- **Consumable Materials Impacts:** estimate the volume(s) of any scarce or unusual materials needed to implement the Proposed Project; and
- **Fuel Consumption Impacts:** identify any changes to existing fuel usage attributable to changes in aircraft operations, ground procedures, or service vehicle utilization.

Changes in energy demands or other natural resource consumption for most FAA projects will not result in significant impacts. If an EA identifies problems such as demands exceeding supplies, additional analysis may be required in an EIS. Otherwise, it may be assumed that impacts are not significant.

Significance determinations can be made by estimating the amount of natural and energy resources needed for a project and comparing that estimate to local supply and demand information. Local supply and demand information for the assessed resources can be obtained from local utilities and suppliers.

The implementation of either Alternative 2B or 2D would not cause unsupportable demands on available natural resources or energy supplies, and construction and operation of either Alternative 2B or 2D would not require consumable natural and energy resources that would be considered in short supply in Puerto Rico.

Additionally, the Proposed Project would not significantly affect features unique to karst features, and is unlikely to be affected by karst-related soil instability. Therefore, neither Alternative 2B nor 2D is anticipated to result in a significant impact on this resource category.

No-Action Alternative

Under the No-Action Alternative, no changes would be made at the site. There would be no additional requirements for natural and energy resources and no impacts to APE-ZC karst features.

4.8.2.1. Avoidance, Minimization and Mitigation Measures

Because no significant impacts to energy or natural resources are anticipated, mitigation measures are not warranted. To the extent applicable and practical, BQN would consider design measures that reduce energy consumption, solid waste generation, and water consumption, and would apply sustainable construction and engineering practices wherever possible. Engineering

measures identified in the geotechnical study and report previously referenced, such as the use of geogrids and designing pavement slops to prevent water infiltration, would mitigate any possible effects caused by the presence of unsuitable fill material.

4.9. NOISE AND NOISE COMPATIBLE LAND USE

The evaluation of the BQN noise environment, and land use compatibility associated with airport noise, was conducted using methodologies developed by the FAA and published in FAA Order 5050.4B, FAA Order 1050.1F, and title 14 CFR Part 150.

For aviation noise analysis, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of yearly DNL which is used as FAA's primary metric. DNL is a 24-hour time-weighted-average noise metric expressed in A-weighted decibels (dBA) which accounts for the noise levels of all individual aircraft events, the number of times those events occur, and the time of day which they occur. DNL has two time periods: daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.). In order to represent the added intrusiveness of sounds occurring during nighttime hours, DNL penalizes or weights events occurring during the nighttime periods by 10 dBA.

Title 14 CFR Part 150, Appendix A provides Federal compatible land use guidelines for several land uses as a function of DNL values. The ranges of DNL values reflect the statistical variability for the responses of large groups of people to noise. Compatible or non-compatible land use is determined by comparing the predicted or measured DNL values at a site to the values listed at Title 14 CFR Part 150 (**Table 4.9-1**). It should be noted that Title 14 CFR Part 150 land use compatibility guidelines shown in **Table 4.9-1** do not constitute a Federal determination that a specific land use is acceptable or unacceptable under Federal, state, or local laws. The responsibility for determining acceptable land uses rests with the local authorities through its zoning laws and ordinances.

Table 4.9-1 Land Use Compatibility with Yearly Day-Night Average Sound Levels

	Yearly DNL					
	Below 65 dB	**65-70 dB**	**70-75 dB**	**75-80 dB**	**80-85 dB**	**Over 85 dB**
Residential						
Residential (Other than mobile homes & transient lodges)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						

	Yearly DNL					
	Below 65 dB	**65-70 dB**	**70-75 dB**	**75-80 dB**	**80-85 dB**	**Over 85 dB**
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communications	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, General	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and Optical	Y	Y	25	30	N	N
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y[5]	Y[5]	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

Source: Title 14 CFR part 150, Appendix A, Table 1, January 1998.

NOTE:

The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE:

SLUCM Standard Land Use Coding Manual.

Y (Yes) Land Use and related structures are compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

NLR Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.

25,30, or 35 Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

[1] Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

[2] Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[3] Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[4] Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[5] Land use compatible provided special sound reinforcement systems are installed.

[6] Residential buildings require an NLR of 25 dB.

[7] Residential buildings require an NLR of 30 dB.

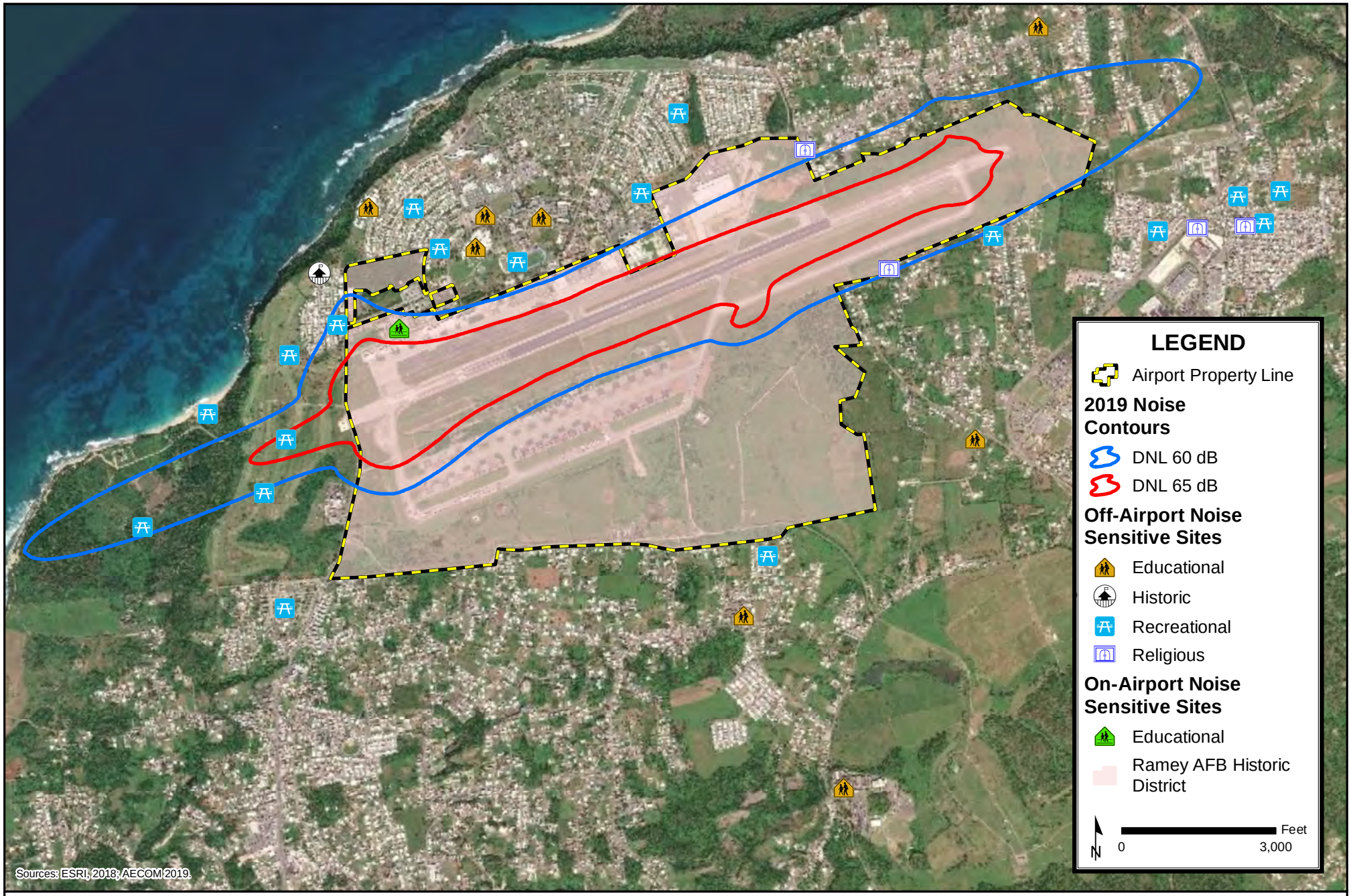
[8] Residential buildings not permitted.
Noncompatible land use denoted in red highlighting.**Affected Environment**

Figure 4.9-1 shows modeled noise exposure resulting from projected aircraft operations under existing conditions. Overall, the acreage of off-airport land contained within the DNL 65 dB or greater contour is approximately 32 acres and approximately 389 acres of off-airport land are contained within the DNL 60 dB or greater contour. Detailed noise impact analysis methodology is shown in **Appendix H**.

A review of existing and future land use within the DNL 60+ dBA and DNL 65+ dBA areas identified for BQN, for existing noise conditions and for each Proposed Action Alternative. As shown on **Figure 4.9-2** and **Table 4.9-2**, land use within the existing DNL 60+ dBA is predominantly classified as Endowment (648.9 acres of the 1,106-acre total). Similarly, land use within the existing DNL 65+ dBA is predominantly classified as Endowment (350.4 acres of the 421.8-acre total). There is substantial coverage of Resource Conservation and Road System land uses within the DNL 60+ dBA (173.7 acres and 160.8 acres, respectively). Within the DNL 65+ dBA, the only land uses not classified as Endowment are Resource Conservation (25 acres) and Road System (91.4 acres). Refer to **Table 4.9-2** for further details on noise compatible land uses within these areas.

4.9.1. ENVIRONMENTAL CONSEQUENCES

Figure 4.9-3 shows modeled noise exposure resulting from projected aircraft operations under the 2024 Alternative 2B scenario. **Figure 4.9-4** shows modeled noise exposure resulting from projected aircraft operations under the 2024 Alternative 2D scenario. Approximately 18 acres of off-airport land would be contained in the DNL 65 dB or greater contour and approximately 460 acres of off-airport land would be exposed to DNL 60 dB or greater contour under the Alternative 2B scenario. Approximately 16 acres of off-airport land would be contained in the DNL 65 dB or greater contour and approximately 475 acres of off-airport land would be contained in the DNL 60 dB or greater contour under Alternative 2D scenario. **Table 4.9-3** summarizes the off-airport area contained in the DNL 60 dB and 65 dB for each build alternative under the 2024 condition. Approximately five residential structures and one recreational area will experience a 1.5 dB increase in DNL 65 dB or greater and approximately 64 residential structures, one church, and three recreational areas will experience a 3 dB increase in DNL 60 dB under the 2024 Condition for both Alternative 2B and 2D. **Table 4.9-4** summarizes the number of noise sensitive areas experiencing a 1.5 dB increase in the DNL 65 dB and 3 dB increase in the 60 dB under the 2024 condition for Alternatives 2B and 2D.



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RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

2019 EXISTING CONDITION
NOISE CONTOUR

FIGURE
4.9-1

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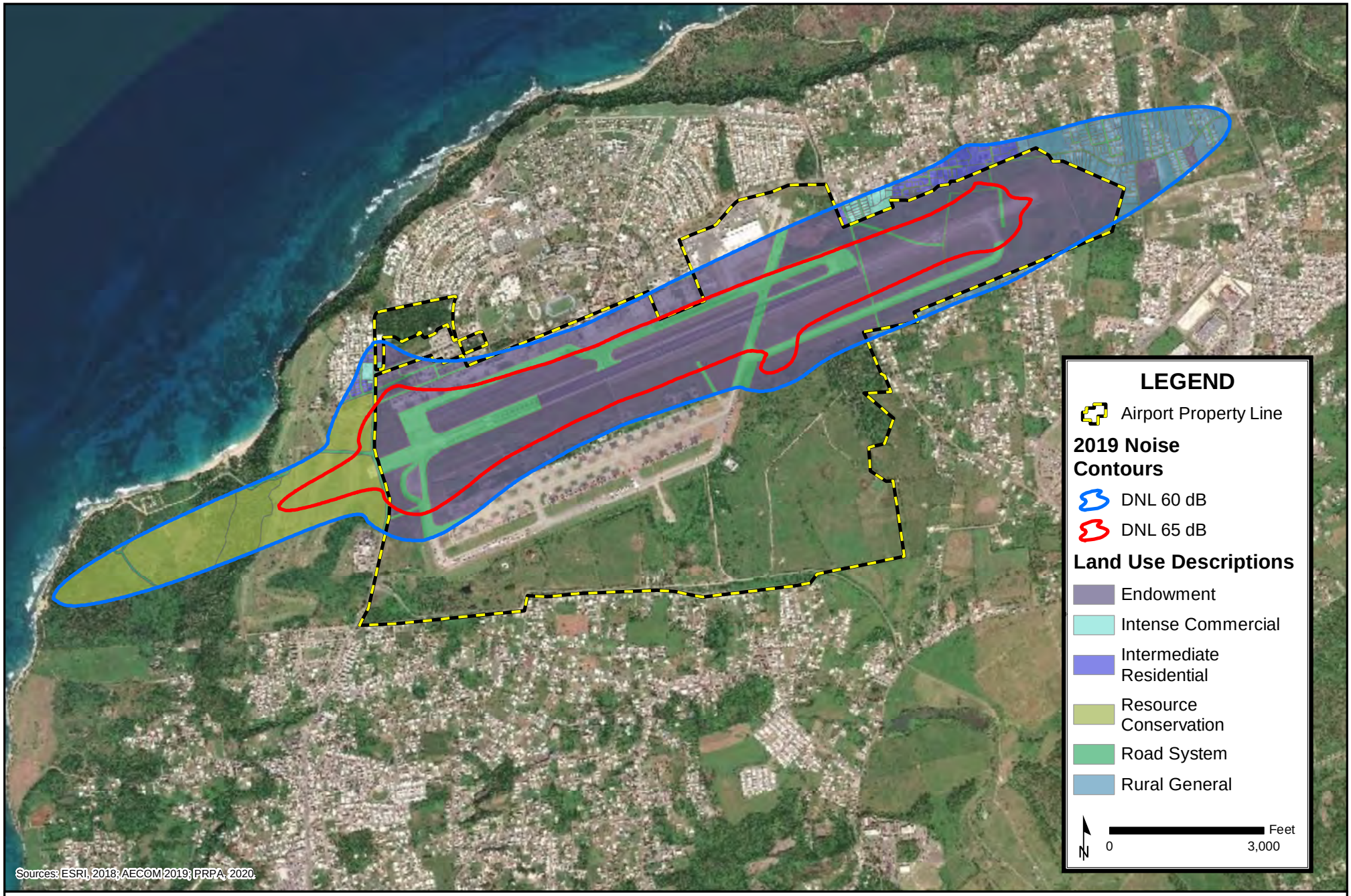

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RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

LAND USE WITHIN 2019 EXISTING CONDITION NOISE CONTOUR

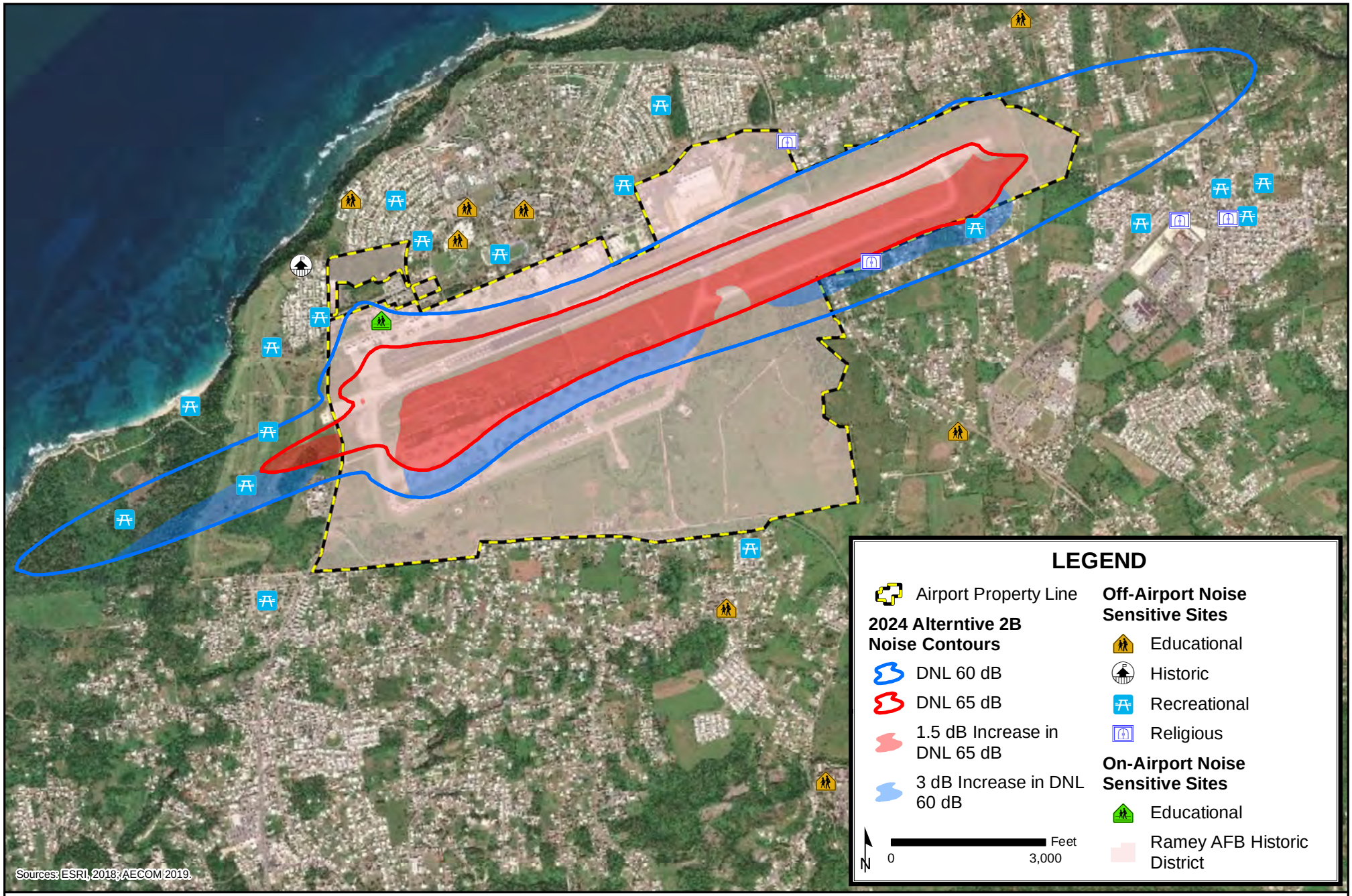
FIGURE 4.9-2

Table 4.9-2 Existing Land Use Noise Exposure Estimates

Land Use Type	Land Use Description	Permitted Uses	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)
Endowment (D)	Public or private land associated with endowment, institutional, tourist, commercial, recreational uses, civic, educational, philanthropic, cultural, scientific, educational, religious or similar as a means of ensuring that they are developed in harmony with the Uses Plan of Land of Puerto Rico.	Municipal business; churches; cemetery; offices; tourist use parking lot; animal hospital; lodging services; commercial (i.e., shops, pharmacy, restaurants); single/multi-family homes; cultural; institutional; museum; renewable energy projects; hospital; outdoor recreational facilities	648.9	305.4
Intense Commercial (CI)	Commercial areas that meet needs of various neighborhoods, residential communities; existing commercial areas of a central nature, including intensive trade and marketing centers	Extensive recreational commercial centers (i.e., retail, lodging services, gas stations, animal hospitals, mortuary, restaurants, theaters, museums, auto shop, hardware stores, light industries)	10.6	-
Intermediate Residential (RI)	Residential areas with intermediate population density	Single-family residential; apartments; row house; lodging services; care centers; emerging businesses that do not generate dust, noise, objectionable smells; urban gardens.	25.6	-
Resource Conservation (CR)	Areas of special value to be improved or maintained to conserve and protect areas of special interest such as, but not limited to, dunes, beaches, lake margins, flora and fauna refuges, etc.	The following uses as long as they do not conflict with the conservation of the resource or land stabilization: recreational/ecotourism; agricultural; lodging services; residential; archaeological excavations; scientific studies; gift shops; museum	173.7	25.0

Land Use Type	Land Use Description	Permitted Uses	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)
Road System (VIAL)	Puerto Rico roadway system	Includes highways; municipal roadways; expressway; forest highways	160.8	91.4
Rural General (RG)	Area with potential for agricultural and agro-ecological activities based on soil characteristics; agricultural reserves	Depends on limitation of infrastructure availability and topographic/geological conditions; fishing/mariculture; sowing/cultivation; compost; animal lodging; agroecology; housing for 1 or 2 families; retail, agricultural shops, education services; health services; warehouses; recycle center; medical cannabis; agricultural equipment repair shop; renewable energy projects; eco-lodge; animal hospital	86.7	-
		TOTAL:	**1,106.3**	**421.8**

Note: Permitted uses and design parameters vary and are reviewed case-by-case by the Board Adjudicative of the OGPe.
Sources: PRPB, *Joint Regulation for Evaluation and Issue of Permits Related to Development, Land Use and Business Operation.* June 7, 2019. ; AEDT 2d; AECOM 2019.



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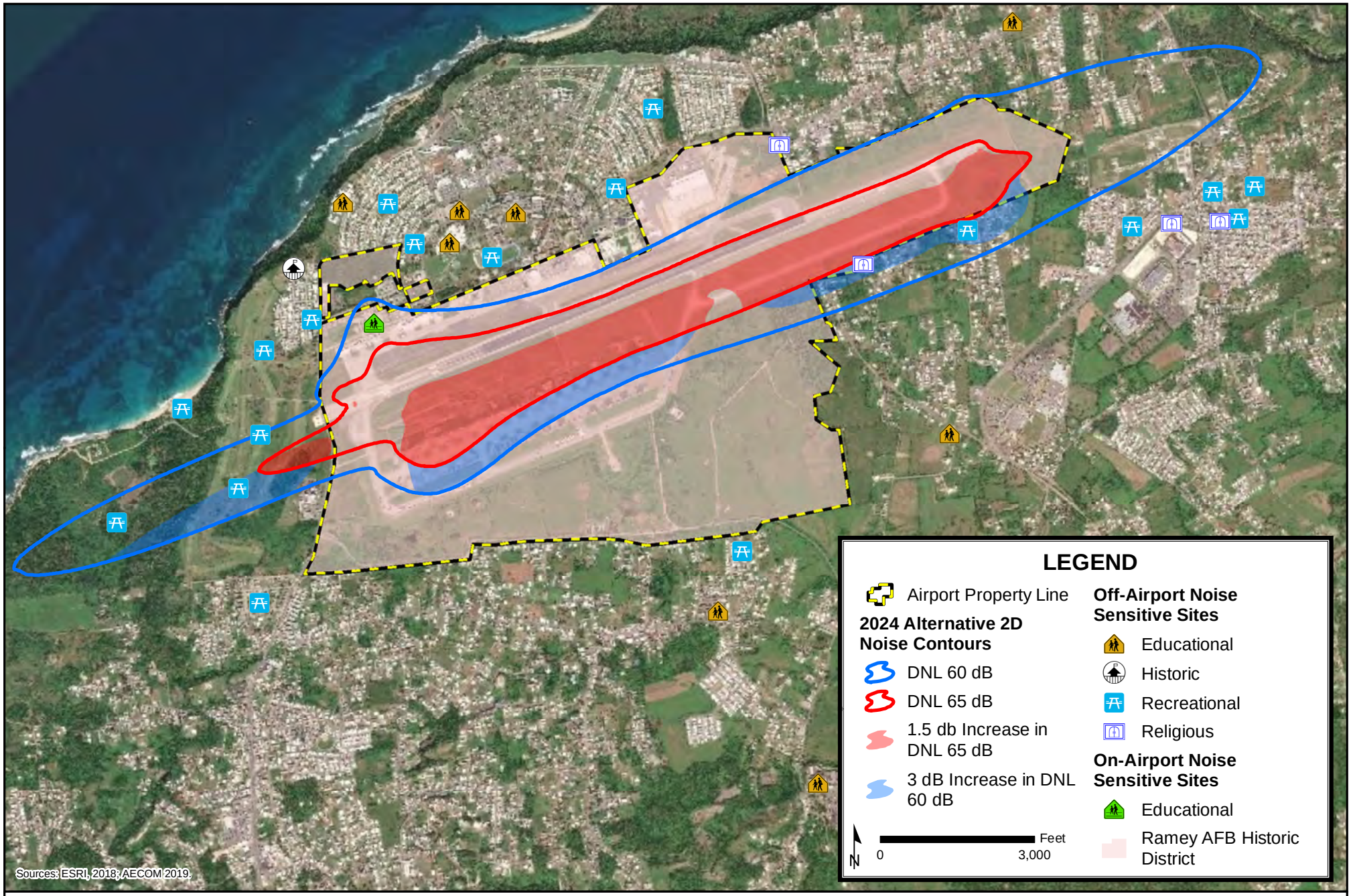
ENVIRONMENTAL ASSESSMENT

2024 ALTERNATIVE 2B NOISE CONTOURS

FIGURE 4.9-3



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2024 ALTERNATIVE 2D NOISE CONTOURS

FIGURE 4.9-4

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Table 4.9-3 2024 Alternatives 2B and 2D Off-Airport Noise Exposure

Alternative	DNL 60 dB (acres)	DNL 65 dB (acres)
2B	460	18
2D	475	16

Source: AECOM, 2019.

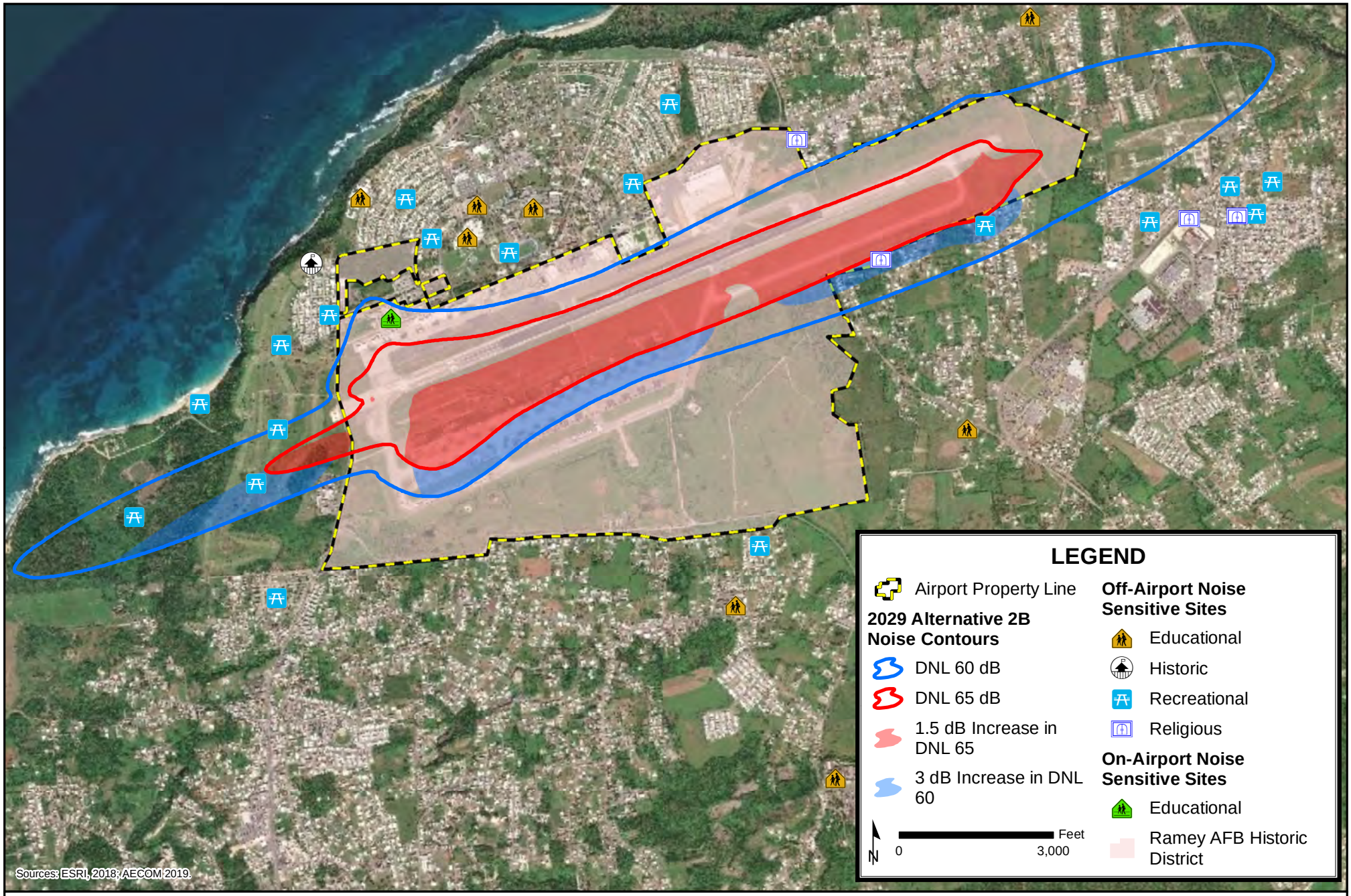
Table 4.9-4 2024 Alternatives 2B and 2D Condition Noise Exposure Estimates (Count)

Category	1.5 dB Increase in the DNL 65 dB	3 dB Increase in the DNL 60 dB
Residential Structures	5	64
Recreational Area	1	3
Church	0	1
Total	**6**	**68**

Source: AECOM, 2019.

Figure 4.9-5 shows modeled noise exposure resulting from projected aircraft operations under the 2029 Alternative 2B scenario. **Figure 4.9-6** shows modeled noise exposure resulting from projected aircraft operations under the 2029 Alternative 2D scenario. Approximately 20 acres of off-airport land would be contained in the DNL 65 dB or greater contour and approximately 496 acres of off-airport land would be exposed to DNL 60 dB or greater contour under the Alternative 2B scenario. Approximately 18 acres of off-airport land would be contained in the DNL 65 dB or greater contour and approximately 511 acres of off-airport land would be contained in the DNL 60 dB or greater contour under Alternative 2D scenario. **Table 4.9-5** summarizes the off-airport area contained in the DNL 60 dB and 65 dB for each build alternative under the 2024 condition.

Approximately five residential structures and one recreational area will experience a 1.5 dB increase in DNL 65 dB or greater and approximately 64 residential structures, one church, and three recreational areas will experience a 3 dB increase in DNL 60 dB under the 2029 Condition for both Alternative 2B and 2D. **Table 4.9-6** summarizes the number of noise sensitive areas experiencing a 1.5 dB increase in the DNL 65 dB and 3 dB increase in the 60 dB under the 2029 Alternative 2B and 2D scenarios.



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ENVIRONMENTAL ASSESSMENT

2029 ALTERNATIVE 2B NOISE CONTOURS

FIGURE 4.9-5

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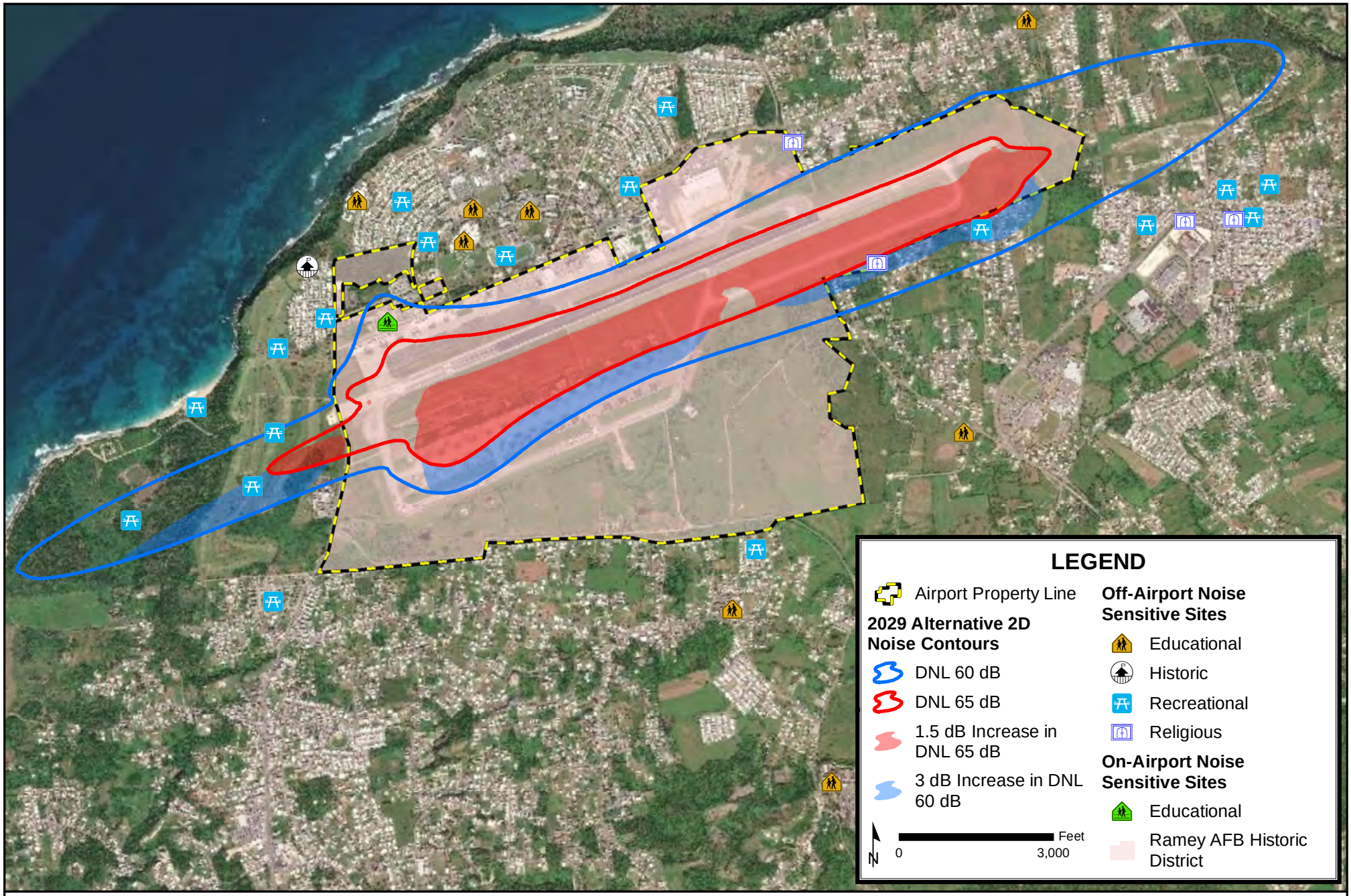

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ENVIRONMENTAL ASSESSMENT

2029 ALTERNATIVE 2D NOISE CONTOURS

FIGURE 4.9-6

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Table 4.9-6 2029 Alternatives 2B and 2D Condition Noise Exposure Estimates (Count)

Category	1.5 dB Increase in the DNL 65 dB	3 dB Increase in the DNL 60 dB
Residential Structures	5	68
Recreational Area	1	3
Church	0	1
Total	**6**	**72**

Source: AECOM, 2019.

Per 49 U.S.C. § 47107(a)(10) and if determined necessary by the FAA, the Airport Sponsor must provide assurance that appropriate action, including adopting zoning laws, has been or will be taken to the extent reasonable, 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 the landing and takeoff of aircraft.

Future land uses and noise impacts to future land use were reviewed for Alternative 2B and Alternative 2D for each of the future study years, as depicted in **Tables 4.9-7** and **4.9-8** and **Figures 4.9-7** through **4.9-10**. For the 2024 study year, Alternative 2B would result in an additional 103 acres being located within the DNL 60+ dBA and an additional 25 acres being located within the DNL 65+ dBA. In the same year, Alternative 2D would result in DNL 60+ dBA and DNL 65+ dBA acreage increases of 109 and 28 acres, respectively. The largest changes to land use type acreage for both Action Alternatives would be increases in Endowment and Rural General land uses acreage, and decreases in Intermediate Residential, Intense Commercial, and Resource Conservation land uses acreage within the affected areas.

For the 2029 study year Alternative 2B would result in an additional 146 acres being located within the DNL 60+ dBA and an additional 39 acres to fall within the DNL 65+ dBA. In the same year, Alternative 2D would result in DNL 60+ dBA and DNL 65+ dBA acreage increases of 152 and 43 acres, respectively. Similar to the 2024 study year, the largest changes to land use type acreage for both Action Alternatives would be increases in Endowment and Rural General land uses acreage, and decreases in Intermediate Residential, Intense Commercial, and Resource Conservation land use acreage within the affected areas.

Table 4.9-7 2024 Condition Noise Exposure Estimates

Land Use Type	Alternative 2B		Alternative 2D	
	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)
Developed Rural Area	<0.1	-	0.8	-
Endowment	690.4	357.4	688.8	365.0
Federal Property	3.2	-	6.7	-
Intense Commercial	-	-	0.2	-
Intermediate Residential	1.9	-	1.8	-
Resource Conservation	160.8	14.1	156.3	12.6
Road System	186.3	74.3	185.4	72.1
Rural General	166.8	0.5	175.6	0.5
TOTAL:	**1,209.4**	**446.3**	**1,215.6**	**450.2**

Source: PRPB 2020, AEDT ,2019.

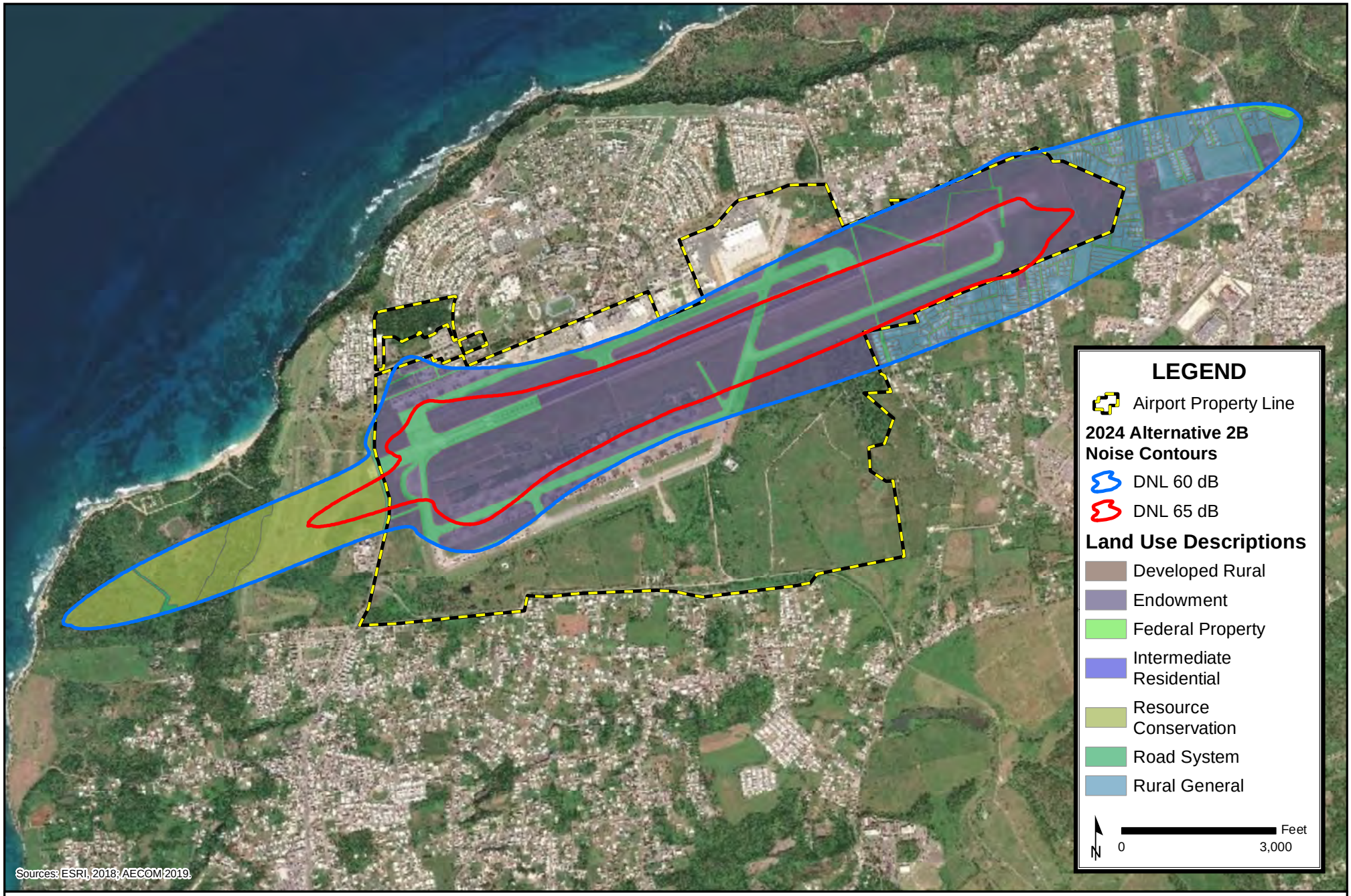
Table 4.9-8 2029 Condition Noise Exposure Estimates

Land Use Type	Alternative 2B		Alternative 2D	
	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)	DNL 60+ dBA (acres)	DNL 65+ dBA (acres)
Developed Rural Area	0.3	-	3.2	-
Endowment	702.5	367.1	700.0	374.8
Federal Property	5.6	-	8.8	-
Intense Commercial	0.5	-	0.9	-
Intermediate Residential	3.4	-	3.2	-
Resource Conservation	171.7	15.9	167.7	14.2
Road System	191.0	76.6	190.4	74.5
Rural General	176.8	0.8	183.7	0.8
TOTAL:	**1,251.8**	**460.4**	**1,257.9**	**464.3**

Source: PRPB 2020, AEDT ,2019.

Table 4.9-1 summarizes the consistency of various land uses with noise levels. The FAA has not established significance thresholds specifically for land use, nor have they identified specific factors to consider in making a significance determination for land use. Significant impact determinations typically depend on the significant impacts of other resource categories, each of which is discussed in detail throughout this EA.

In general, both Proposed Project Action Alternatives are consistent with applicable Federal, territory and local land use plans and zoning ordinances.



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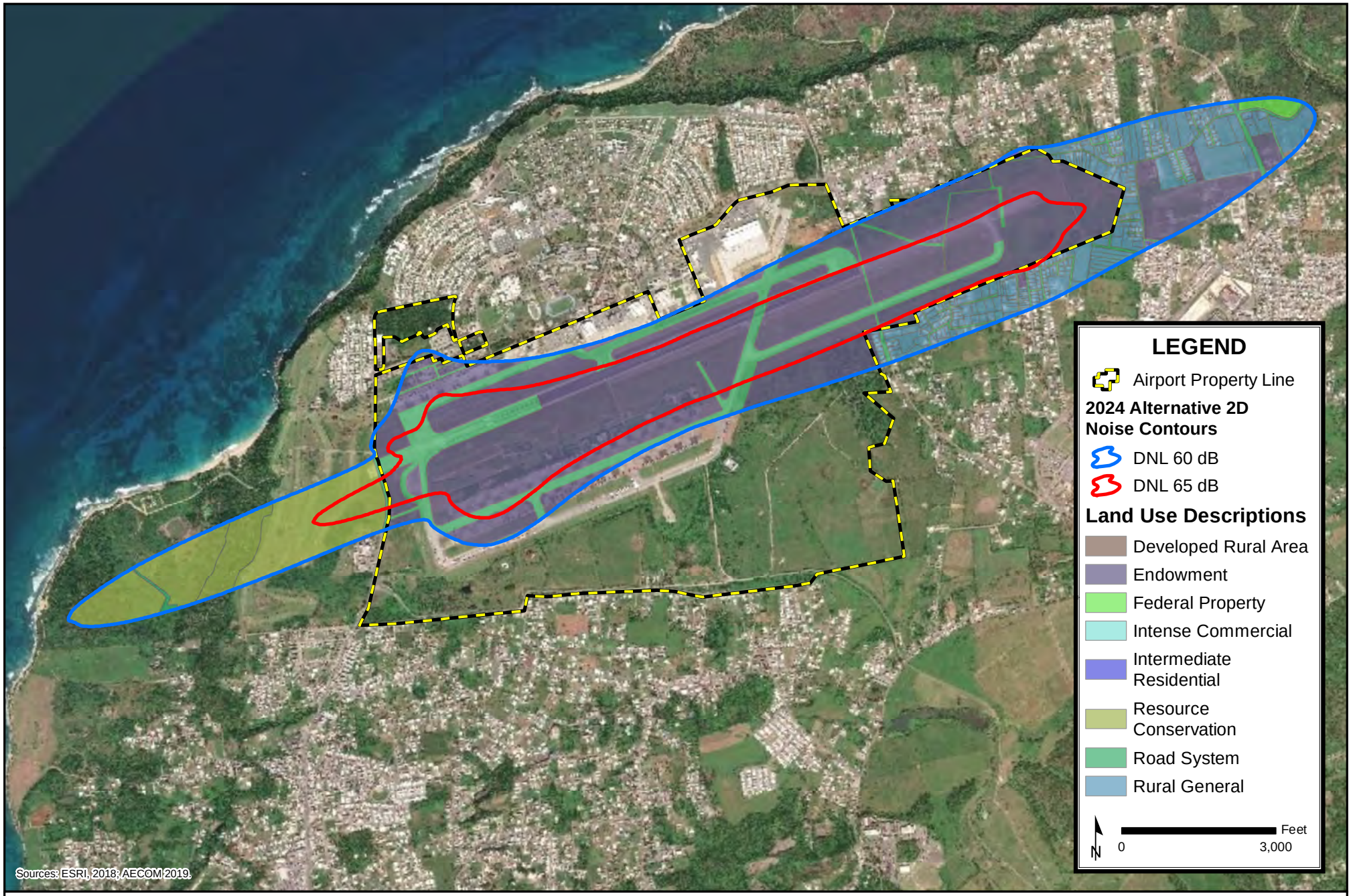
ENVIRONMENTAL ASSESSMENT

LAND USE WITHIN 2024 ALTERNATIVE 2B NOISE CONTOURS

FIGURE 4.9-7



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RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

LAND USE WITHIN 2024 ALTERNATIVE 2D NOISE CONTOURS

FIGURE 4.9-8

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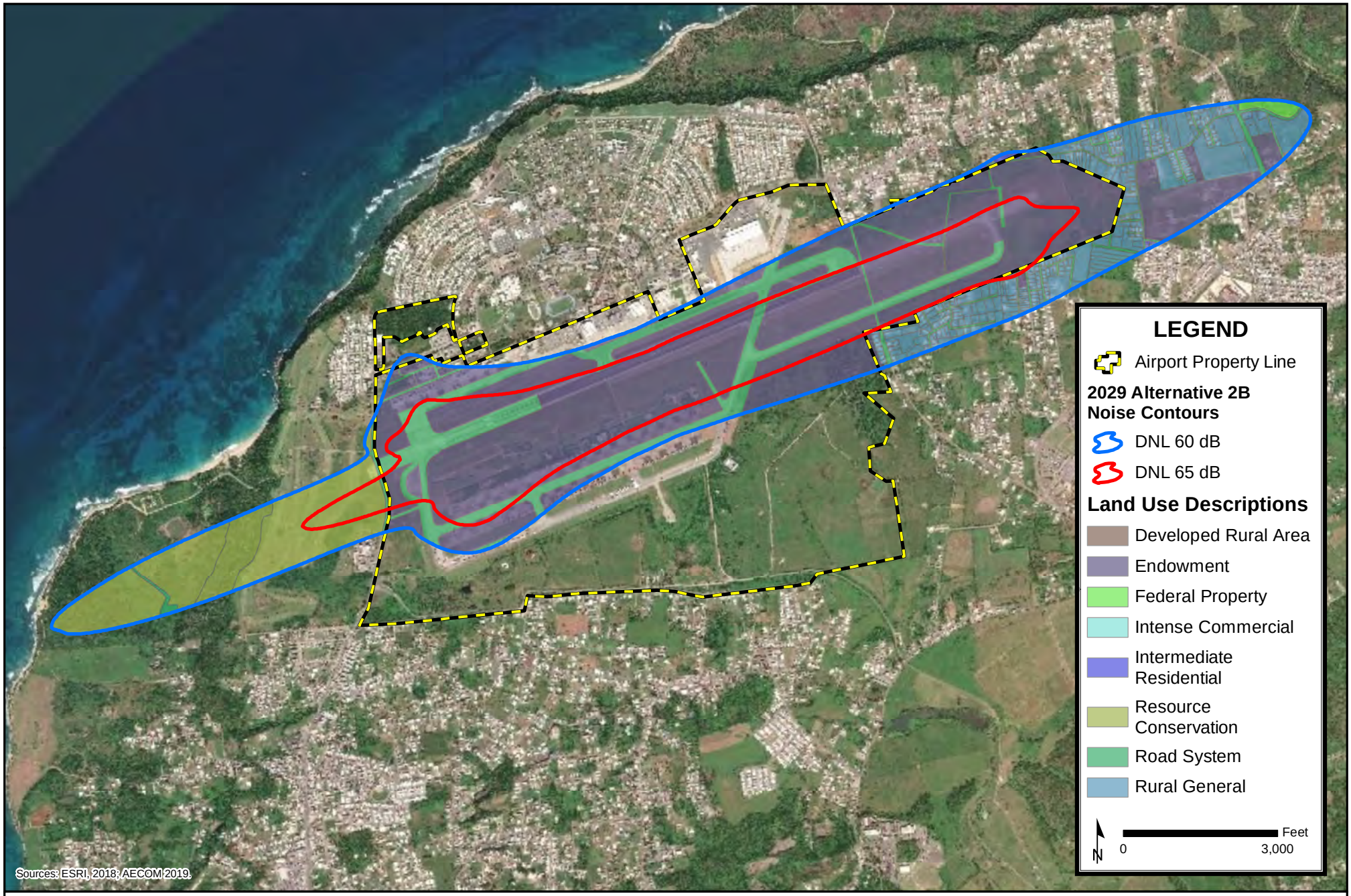

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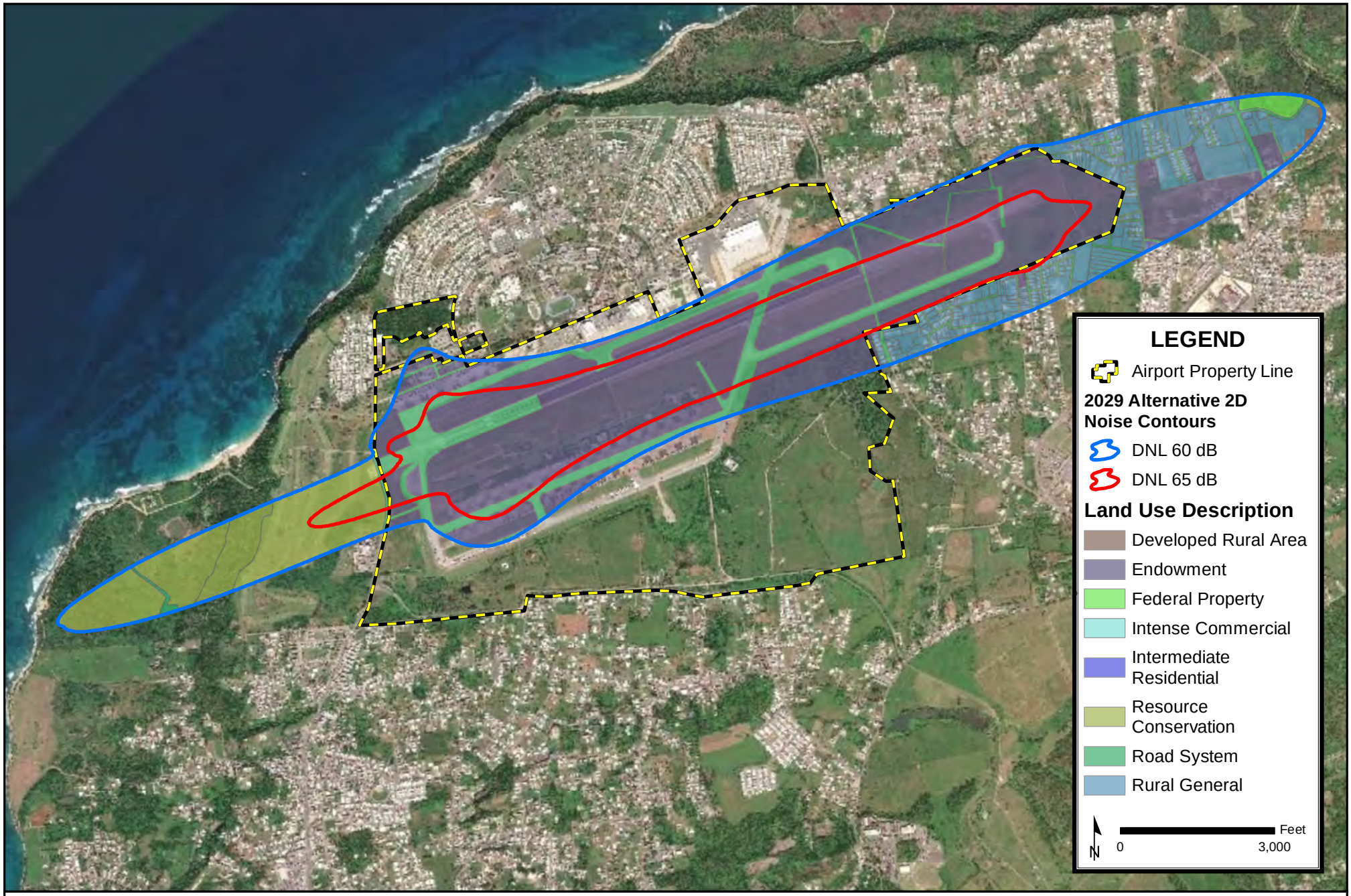
RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

LAND USE WITHIN 2029 ALTERNATIVE 2B NOISE CONTOURS

FIGURE 4.9-9



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RUNWAY 8-26 RECONSTRUCTION
ENVIRONMENTAL ASSESSMENT

LAND USE WITHIN 2029 ALTERNATIVE 2D NOISE CONTOURS

FIGURE 4.9-10

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No-Action Alternative

Under the No-Action Alternative, no construction activities would occur at the project site. Therefore, noise levels would result only from operational activities at the site. Current operations at BQN would continue, with no anticipated change in noise levels. Therefore, no additional noise impacts would be expected from the No-Action Alternative.

4.9.1.1. Avoidance, Minimization and Mitigation Measures

According to a specific point analysis prepared in Aviation Environmental Design Tool (AEDT), the Proposed Project would result in a DNL 1.5 dB increase on nearby residential and religious land uses in the 2024 and 2029 study year, as previously discussed.

These areas are not included in a Part 150 program and mitigation will be required. The Airport Sponsor would offer to purchase properties experiencing a 1.5 dB or greater increase within the DNL 65 dB contour as a result of the Proposed Project, for fair market value, and offer to provide relocation assistance payments to the occupants. Purchased properties would be converted to appropriate noise compatible land uses. For properties that would be purchased outright, affected residents would be considered "displaced persons" under 42 U.S.C. 61, the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Uniform Act) and its implementing regulations under 49 CFR Part 29. See **Section 4.10.2.5** for a discussion of provisions and requirements of the Uniform Act for displaced persons.

Alternative methods of mitigation would be offered to the homeowners of residential properties experiencing a 3 dB increase within the DNL 60 dB noise contours resulting from the Proposed Project. These methods include a sales assistance program and purchase assurance program, all with an associated avigation easement. The choice of purchase assurance or sales assistance are measures with which to assist homeowners who prefer to move from the noise impacted areas to facilitate a timely market sale of noise impacted properties. Participation in the purchase assurance/sales assistance programs recommended for this EA would be voluntary on the part of all homeowners and property owners; therefore, no relocation assistance costs would be included for participants. These measures are described in detail below. A sound insulation program was also explored as an alternative method for noise impact mitigation. However, this program was determined to be infeasible due to the fact that the existing frames/foundations of many houses in the area are not conducive to receiving effective sound insulation improvements, and that many would not be readily able to meet building code regulations that would enable the level of structural modifications necessary to achieve the necessary sound reduction.

The affected homeowner has ultimate decision making regarding the preferred mitigation for their property and may choose any one of the four options.

Purchase of Avigation Easements

An avigation easement is an easement or right of overflight in the airspace above or in the vicinity of a particular property. The interest in the land is recorded with the property deed, and transfers from owner to owner. The owner of an easement-encumbered property (servient property) has restricted use of their property subject to the airport sponsor's easement (dominant property) for

overflight and other applicable restrictions on the use and development of the servient parcel. It also includes the right to create noise or other effects that may result from the lawful operation of aircraft in easement airspace and the right for the Airport to remove any obstructions to such overflight. An avigation easement provides right of flight at any altitude above the approach surface and a right to create noise, vibrations, dust, fumes, etc. without incurring any liability. Thus, the provider of an avigation easement has given up the right to litigate for noise or nuisance damages associated with the normal operation of aircraft to and from an airport. FAA AC 150/5100-17, Change 6, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*, states that where it is determined that fee title is not necessary (i.e. an Airport is not required to purchase full interest of the property), an avigation easement may be used to secure airspace for airport and runway approach protection and for noise compatibility programs.[25]

It may be appropriate for an airport sponsor to purchase avigation easements if sound insulation is not feasible or desirable, or the cost of land acquisition and relocation are too high. Avigation easements provide the airport sponsor with a limited form of control on surrounding properties, while maintaining neighborhood character and stability. To ensure easement rights remain enforceable, a mortgage holder's interest in the property should be subordinated to the easement's rights. Subordination assures the easement rights will survive a foreclosure action and mortgagee or trustee sale of the fee interest. After selling an easement to the airport, homeowners can still sell their homes; however, potential buyers must be provided with an appropriate disclosure statement in the sales contract which describes the airport noise exposure on the property and the airport's avigation rights in the form of the recorded perpetual easement.

Easements are significantly less expensive to acquire than full fee-simple interest. However, valuation of an easement is a very difficult task. An avigation easement acquisition program for noncompatible dwelling units located within the DNL 65 dB noise contours may be eligible for consideration of Federal funding through the noise set-aside component of the AIP. It is estimated that an average avigation easement would be valued at $18,519 per parcel. This estimate assumes that the Airport Sponsor would pay easement damages per unit equal to 20% of fair market value of easement parcels. In total, 101 parcels would require purchase of avigation easements, and the estimated total cost of easement purchase would be $1,870,427.72. This estimate also assumes that every affected parcel would require the purchase of an avigation easement. See **Tables 4.9-9** and **4.10-10** for additional details.

Acquisition of easements does not reduce the noise impacts on people or by and of itself change noncompatible land uses to compatible land uses. Nonetheless, purchase of an easement provides fair disclosure and constitutes a suitable compatibility measure according to Federal guidelines.

Purchase Assurance

[25] AC 150/5100-17 - *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects* .Change 7 (Consolidated). FAA. July 10, 2017.

This measure helps facilitate a timely market sale of a noise impacted property. Under purchase assurance, a property that fails to sell within a specified time is purchased by the airport operator and then resold for continued residential use. The airport operator purchases the property at the appraised market value "as is" subject to airport noise. Typically, sound insulation is provided and the property is then listed and sold subject to the airport's avigation easement. If the airport operator purchases the property prior to resale, the airport operator must retain an easement. A purchase assistance program requires an extensive property management and sales effort on the part of the airport operator and may be contracted with consultants and/or realtors. Some list price premium may be desirable to secure the market price on the airport's sale of the property. Furthermore, the Airport Sponsor must ensure that eligible buyers have an appropriate disclosure describing the airport's noise exposure on the property and the intention of the Airport Sponsor to retain an easement on the property.

The estimated net cost of purchase assurance for the Proposed Project (not including administrative costs) totals $3,273,248.51. This estimate assumes an average property value of $46,297.72 for affected parcels, that 70% of affected homeowners would select purchase assurance, and that properties acquired by the Airport Sponsor could be resold for 50% of fair market value. See **Table 4.9-9** for additional details of this cost estimate. Administrative costs, including abstract of title, appraisal, review appraisal, boundary survey, environmental site assessment, legal, and recording costs were estimated at $20,000 per parcel.

Table 4.9-9 Fee Simple Acquisition in DNL 65, Avigation Easement for all in DNL 60, Purchase Assurance in DNL 60

Impacted Area	Mitigation Component	Unit Qty			Value (Average $ per Unit)		Total Cost*
		Parcels	Structures	Impacted Structures	Fair Market Value**	Easement Damages***	
+1.5 dB in DNL 65	Fee Simple acquisition	9	9	5	$35,866.89	$-	$322,802.00
+3.0 dB in DNL 60	Avigation Easement	101	90	65		$18,519.09	$1,870,427.72
	Purchase Assurance****	71	63	46	$46,297.72		$3,273,248.51
						Program/Administrative Costs (25%)	$1,366,619.56
						Total Cost	$6,833,097.78

*For conservativeness, cost extensions are based on total number of structures on each parcel according to property data. EA counts of impacted structures were derived by visual inspection of aerial photos and are shown for comparison. Fee simple calculation = # parcels x average fair market value of affected parcels ($35,866.89). Avigation easement calculation= # parcels x fair market value of affected parcels ($92,595.43) x 20%. Purchase assurance calculation = # parcels x 70% x average fair market value of affected parcels ($92,595.43) x 50%. Values may reflect rounding.

**Based on total parcel value plus sale value of structure(s) on parcel. Stated value in table reflects calculation result described above.

*** Assumes PRPA would pay easement damages per unit equal to 20% of Fair Market Value of easement parcels. Stated value in table reflects calculation result described above.

**** Assumes 70% of parcels would require purchase assistance and can be resold by PRPA for 50% of fair market value

Table 4.9-10 Fee Simple Acquisition in DNL 65, Avigation Easement for all in DNL 60, Sales Assistance in DNL 60

Impacted Area	Mitigation Component	Unit Qty			Value (Average $ per Unit)		Total Cost*
		Parcels	Structures	Impacted Structures	Fair Market Value**	Easement Damages***	
+1.5 dB in DNL 65	Fee Simple acquisition	9	9	5	$35,866.89	$-	$322,802.00
+3.0 dB in DNL 60	Avigation Easement	101	90	65		$18,519.09	$1,870,427.72
	Sales Assistance****	71	63	46	$13,889.31		$981,974.55
Program/Administrative Costs (25%)							$793,801.07
Total Cost							$3,969,005.34

*For conservativeness, cost extensions are based on total number of structures on each parcel according to property data. EA counts of impacted structures were derived by visual inspection of aerial photos and are shown for comparison. Fee simple calculation = # parcels x average fair market value of affected parcels ($35,866.89). Avigation easement calculation= # parcels x fair market value of affected parcels ($92,595.43) x 20%. Sales assurance calculation = # parcels x 70% x average fair market value of affected parcels ($92,595.43) x 15%. Values may reflect rounding.

**Based on total parcel value plus sale value of structure(s) on parcel. Stated value in table reflects calculation results described above.

*** Assumes PRPA would pay easement damages per unit equal to 20% of Fair Market Value of easement parcels. Stated value in table reflects calculation result described above.

**** Assumes 70% of parcels would require sales assistance. Assumes seller would receive at least 85% of sale price and PRPA would contribute the remaining 15% to assure the seller 100% asking price

Sales Assistance

Under sales assistance, the appraised market value of the homeowner's residence is guaranteed on a timely market sale; however, the airport does not acquire the property. Should the property sell for less than the appraised value, the selling owner is compensated for the shortfall by the airport operator. Property is appraised at its current market value "as is" subject to airport noise, and the Airport Sponsor must ensure that eligible buyers have an appropriate disclosure describing the airport's noise exposure on the property and the intention of the Airport Sponsor to retain an easement on the property. The property is listed and sold subject to the airport's avigation easement that is conveyed to the airport operator at the sale of the property.

The estimated cost of sales assistance, assuming 70% of affected parcel owners would choose this mitigation option, is $981,974.55. This estimate further assumes each seller would receive at least 85% of sale price and the Airport Sponsor would contribute the remaining 15% to assure the seller receives 100% of asking price.

The results of purchase assurance/sales assistance are that:

- The existing occupant is able to sell the property and move away from a noise impacted area.
- The new occupant acquires the property with full disclosure of the noise environment.
- The airport operator retains an avigation easement over the property to permit continued

over flights and their attendant noise.

The property sale listing and purchase contract should explicitly disclose and acknowledge that the property is within the airport's noise impact area and that the property is encumbered with the avigation easement conveyed before their purchase of the property.

The advantages of purchase assurance/sales assistance is that they maintain a viable residential neighborhood and are less costly measures than a buy-out and redevelopment to secure compatible land use. The selling owner for purchase assurance/sales assistance is not considered a "displaced person" and is not eligible for relocation assistance under the Uniform Act.

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

4.10.1. AFFECTED ENVIRONMENT

An SSA was established to support the analysis of social and economic conditions in the area of the Proposed Project. The SSA encompasses the municipality of Aguadilla. The SSA serves as the focus of the evaluation of direct, indirect, and secondary and cumulative socioeconomic effects. Refer back to **Figure 4.1-1** for a depiction of the SSA.

Information pertaining to the existing social and economic characteristics of the SSA was gathered from data published by the US Census Bureau. Specifically, 2013-2017 American Community Survey (ACS) 5-Year Estimates was used to identify the income/poverty and racial/ethnic characteristics of the population within the SSA and serve as the basis for the assessment of economic activity and employment.

4.10.1.1. Population

Table 4.10-1 describes the population present within the SSA, Puerto Rico, and the US. In 2017, the population of Puerto Rico was estimated at 3,468,963 residents. The SSA was estimated to contain 55,722 residents. US Census data shows that the population density within the SSA (1,668.5 people per square mile) is considerably higher than that generally seen in the commonwealth (1088.2 people per square mile).

Additionally, ACS estimates show that approximately 68% of the adult population within the SSA attained a high school diploma or higher level of education. Approximately 24% of the population within the SSA holds a bachelor's or higher degree.

Table 4.10-1 Community Characteristics

Subject	SSA		Puerto Rico		US	
	Number	%	Number	%	Number	%
Total Population	55,722	100.0	3,468,963	100.0	321,004,407	100.0
Age						
< 5 years	2,625	4.7	172,199	5.0	19,853,515	6.2
5 to 17 years	9,011	16.2	559,128	16.1	53,747,764	16.7
18 to 29 years	8,743	15.7	571,027	16.5	53,538,402	16.7
30 to 39 years	6,929	12.4	428,324	12.3	42,026,664	13.1
40 to 49 years	6,984	12.5	444,984	12.8	41,228,606	12.8
50 to 64 years	10,642	19.1	663,680	19.1	62,877,067	19.6
+65 years	10,788	19.4	629,621	18.2	47,732,389	14.9
Median Age	40.6	n/a	39.9	n/a	37.8	n/a
Race						
White	39,551	71.0	2,389,446	68.9	234,370,202	73.0
Black or African American	2,052	3.7	338,939	9.8	40,610,815	12.7
American Indian and Alaska Native	131	0.2	10,849	0.3	2,632,102	0.8
Asian	580	1.0	7,789	0.2	17,186,320	5.4
Native Hawaiian and Other Pacific Islander	10	0.0	136	0.0	570,116	0.2
Some other race	8,313	14.9	511,785	14.8	15,553,808	4.8
Two or more races	5,085	9.1	210,019	6.1	10,081,044	3.1
Ethnicity						
Hispanic	54,216	97.3	3,432,611	99.0	56,510,571	17.6
Households						
Average Household Size	2.52	n/a	2.93	n/a	2.63	n/a

Notes: n/a = not applicable
Source: US Census Bureau, 2013-2017 ACS, B01001, B01002, B02001, B03003, B25010

4.10.1.2. Age, Race and Ethnicity

The racial, ethnic and age composition of the population present within the SSA, Puerto Rico, and the US is shown in **Table 4.10-1**. Data from the ACS reveals that the White population comprises approximately 71% of the SSA's total compared to 69% in Puerto Rico and 73% in the US. The median age in the SSA is 40.6 years compared to 39.9 years in Puerto Rico and 37.8 years in the US.

4.10.1.3. Housing Characteristics

Within the SSA, there are approximately 27,301 residential parcels on 23,379 acres of land. Of the residential parcels present, approximately 80% support single family homes, almost 20% support multi-family homes, and less than one % support mobile homes and other types of residences (see **Table 4.10-2**).

Table 4.10-2 Residential Parcel Types within the SSA

Residential Type	Number	% Total
Single-Family Parcels	21,890	80.2
Multi-Family Parcels	5,389	19.7
Mobile Home Parcels	22	0.1
Other Types of Residential Parcels	0	0.0
TOTAL:	27,301	100.0

Source: US Census Bureau, 2013-2017 ACS, B25024

4.10.1.4. Economy and Employment

Estimates from the US Bureau of Labor Statistics indicate that there are approximately 43,380 non-farm jobs within Aguadilla-Isabela metropolitan area. **Table 4.10-3** provides a summary of jobs within this area by Standard Occupational Classification (SOC) and employment sector. As shown, the most common industries are based in the Office and Administrative Support (15.6%), Sales and Related Occupations (13.4%), and Education, Training, and Library Occupations (11.9%) sectors. Between 2013 and 2018, the average annual unemployment rate in the Aguadilla-Isabela area fluctuated between 19.7% and 12.2%. Data for July 2019 indicates a monthly unemployment rate of 10.2%.[26]

Table 4.10-3 Aguadilla-Isabela Employment by SOC Sector

SOC Code	Sector	Estimate	Share
11-0000	Management Occupations	1,470	3.4%
13-0000	Business and Financial Operations Occupations	1,580	3.6%
15-0000	Computer and Mathematical Occupations	850	2.0%
17-0000	Architecture and Engineering Occupations	1,880	4.3%
19-0000	Life, Physical, and Social Science Occupations	150	0.3%
21-0000	Community and Social Service Occupations	470	1.1%
23-0000	Legal Occupations	50	0.1%
25-0000	Education, Training, and Library Occupations	5,170	11.9%
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	220	0.5%
29-0000	Healthcare Practitioners and Technical Occupations	2,060	4.7%
31-0000	Healthcare Support Occupations	830	1.9%
33-0000	Protective Service Occupations	860	2.0%
35-0000	Food Preparation and Serving Related Occupations	3,630	8.4%
37-0000	Building and Grounds Cleaning and Maintenance Occupations	1,730	4.0%
39-0000	Personal Care and Service Occupations	650	1.5%
41-0000	Sales and Related Occupations	5,800	13.4%
43-0000	Office and Administrative Support Occupations	6,780	15.6%
45-0000	Farming, Fishing, and Forestry Occupations	40	0.1%

[26] US Bureau of Labor Statistics. Databases, Tables & Calculators by Subject. Accessed on September 19, 2019 from https://www.bls.gov/data/.

SOC Code	Sector	Estimate	Share
47-0000	Construction and Extraction Occupations	1,490	3.4%
49-0000	Installation, Maintenance, and Repair Occupations	1,260	2.9%
51-0000	Production Occupations	4,160	9.6%
53-0000	Transportation and Material Moving Occupations	2,250	5.2%
00-0000	All Occupations	43,380	100.0%

Source: US Bureau of Labor Statistics. Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates: Aguadilla-Isabela, PR. May 2018 Data.

4.10.1.5. Household Income and Poverty

The 2017 ACS reported the median household income in the municipality of Aguadilla at $16,821. Also, in 2017, the per capita income was estimated at $10,872 in municipality of Aguadilla. **Table 4.10-4** provides a summary of household income within the SSA. Based on the ACS income estimates, approximately 51.6% of Aguadilla municipality residents fell below the poverty level in 2017.[27]

Table 4.10-4 Household Income within the SSA

Income Range	Households
Less than $10,000	6876
$10,000 to $14,999	2898
$15,000 to $19,999	2137
$20,000 to $24,999	1791
$25,000 to $29,999	1312
$30,000 to $34,999	1114
$35,000 to $39,999	794
$40,000 to $44,999	798
$45,000 to $49,999	482
$50,000 to $59,999	899
$60,000 to $74,999	982
$75,000 to $99,999	561
$100,000 to $124,999	369
$125,000 to $149,999	124
$150,000 to $199,999	72
$200,000 or more	113

Source: US Census Bureau, 2013 - 2017 ACS, B19001

4.10.1.6. Environmental Justice

EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN) reports environmental and demographic indicators, drawing from the US Census Bureau's ACS, the National Air Toxics

[27] US Census Bureau, 2013-2017 ACS, B17001, B19301, and S1903.

Assessment (NATA), information from the Center for Disease Control and other sources. These indicators are used to assess potential environmental justice issues in planning and decision-making processes.

Environmental and demographic indicators from EJSCREEN are summarized on **Table 4.10-5** below. Indicators are expressed in terms of percentiles compared to similar statistics within the Commonwealth of Puerto Rico. At this time, the EPA and the EJSCREEN tool do not provide comparisons for Puerto Rico to the rest of the EPA region or the US.

Table 4.10-5 Socioeconomic Indicators (EJSCREEN)

Category	Percentile: Puerto Rico
Environmental Indicators	
PM	N/A
O_3	N/A
NATA· Diesel PM	41
NATA· Cancer Risk	49
NATA· Respiratory Hazard Index	64
Traffic Proximity and Volume	59
Lead Paint Indicator	78
Superfund Proximity	2
Risk Management Plan Proximity	23
Hazardous Waste Proximity	75
Wastewater Discharge Indicator	64
Demographic Indicators	
Demographic Index (composite of minority and low-income population statistics)	33
Minority Population	13
Low Income Population	35
Linguistically Isolated Population	15
Population With Less Than High School Education	55
Population Under 5 years of age	50
Population over 64 years of age	52

Source: EJSCREEN, 2019.
N/A = Not applicable

A low percentile value signifies that the BQN area scores or ranks better or is at lower risk for that indicator compared to the commonwealth population; a high percentile value signifies that the BQN area ranks worse or is at elevated risk compared to commonwealth populations.

In terms of reported environmental indicators, nearly all environmental indicators show that the BQN area ranks better or is comparable to reference populations for risk of environmental exposure. The only notable exceptions are the indicators for risk from lead paint exposure and for proximity to hazardous waste facilities. Demographically, EJSCREEN reports that the level of

minority and low-income populations are relatively low compared to commonwealth trends. The area's population under age five and its elderly population are both comparable to commonwealth trends.

4.10.2. ENVIRONMENTAL CONSEQUENCES

Socioeconomic impacts having potential to result from the Proposed Project and retained alternatives were evaluated based on the thresholds of significance outlined in FAA Order 1050.1F to include:

- Extensive relocation of residents and availability of replacement housing;
- Extensive relocation of community businesses that would create severe economic hardship for the affected communities;
- Disruptions of local traffic patterns that substantially reduce the levels of service (LOS) of the roads serving the Airport and its surrounding communities; and
- A substantial loss in community tax base.

Impacts were determined through the evaluation of the areas affected. Potentially affected land use, residences, commercial buildings, and transportation facilities were identified through GIS analysis.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies include environmental justice as part of their mission by identifying and addressing as appropriate, the potential for disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and Native American tribes. DOT Order 5610.2, *Environmental Justice in Minority and Low-Income Populations,* implements EO 12898 and was used by FAA for this analysis.

For purposes of this analysis, minority populations and low-income populations were defined as follows:

- A minority is defined as a person of Hispanic or Latino origin of any race; Black or African American; Asian; American Indian or Alaskan Native; and Hawaiian or Pacific Islanders.
- A low-income person is defined as a person living below poverty. The US Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the established threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically but are updated annually to account for inflation.

Environmental justice impacts were evaluated through quantification of populations and households affected by land acquisition and potential noise impacts for the Proposed Project and retained alternatives to determine if there would be a disproportionately high adverse impact on minority and low-income populations and households. Census data was used to determine the populations and households affected by the Proposed Project and retained alternatives.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risk*, requires Federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children and ensure that its actions address any disproportionate risks. Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to. This evaluation was based on the Proposed Project's potential to result in direct impacts to children in a residential or business setting within the DSA.

According to FAA Order 1050.1F, significant impacts would occur if there were disproportionately high and adverse impacts on low-income and minority populations; disproportionate health and safety risks to children; extensive relocation of residents without sufficient relocation housing available; relocation of businesses that would create severe economic hardship; disruption of traffic patterns affecting the LOS on area roads; and a substantial loss in community tax base.

4.10.2.1. Socioeconomics

Relocation of Runway 8-26 under both Proposed Project Action Alternatives would result in a relocation of the DNL 60 dB and DNL 65 dB noise contours, an increase in airport related noise in several neighborhoods, and therefore impacts to the local socioeconomic environment. Notably, residential land uses are not compatible with sound levels above 65 dB, and the relocation of the DNL 65 dB contour would result in five existing residential structures on nine existing residential parcels being incorporated within this contour. As discussed in **Sections 4.9.2.1** and **4.10.2.5**, these parcels would be purchased by the Airport Sponsor for fair market value and converted to noise compatible land uses. The Airport Sponsor would offer relocation assistance to affected tenants, pursuant to the Uniform Act and all property acquisition would be conducted in accordance with AC 150/5100-17 Change 6 and FAA Order 5100.37B. [28]

65 additional residential structures on 101 parcels would experience a 3 dB or greater increase within the new DNL 60 dB as a result of either Action Alternative. Noise levels below 65 dB are compatible with residential land uses. However, the increase in noise levels and the need for rerouting of air traffic would require the Airport Sponsor to purchase avigation easements (see **Section 4.9.2.1**) at these properties. Avigation easements limit the types of development allowed on parcels and allow the airport to cause noise, dust, fumes, vibrations, and other impacts to the affected property as a result of air traffic overflight.

[28] FAA Order 5100.37B – *Land Acquisition and Relocation Assistance for Airport Projects*. FAA. August 1, 2005. Updated March 14, 2008.

Affected property owners would be offered several options to mitigate noise and other impacts to affected properties, as discussed in **Section 4.9.2.1**. Mitigation for these impacts to the socioeconomic environment are further discussed in **Section 4.10.2.5** below. Fee-simple acquisition would affect nine of 27,301 residential parcels within the SSA, and adherence to AC 150/5100-17, FAA Order 5100.37B, and the Uniform Act for residents of these parcels would mitigate the relatively minor effects of property acquisition. The use of purchase assurance and sales assistance programs for the 101 properties experiencing a 3 dB or greater increase within the DNL 60 dB contour would allow the area to maintain a viable residential neighborhood.

2018 data from the US Census Bureau reveal 20,604 households within the SSA.[29] This indicates that with 27,301 residential parcels within the SSA, adequate local housing would be available to homeowners and other residents of parcels affected by the Proposed Project. It is expected that given the broad availability of and low demand for regional housing, residents and owners either displaced by property acquisition or by property owners' choice to sell affected properties, replacement housing would be available for costs similar those of existing residences.

With the implementation of the aforementioned mitigation measures, compensation, and the implementation of regulatory provisions outlined in the Uniform Act described in detail in **Section 4.10.2.5**, the Proposed Project would not substantially affect regional housing resources or neighborhood viability and would not create an economic hardship on the local community. Therefore, overall socioeconomic effects associated with either Action Alternative are expected to be less-than-significant.

No-Action Alternative

The No-Action Alternative would not change the location or length of the runway from the existing conditions, and would therefore not result in any new properties being affected by increased noise levels or rerouted air traffic. The No-Action Alternative would therefore have no effect on the local socioeconomic environment.

4.10.2.2. Environmental Justice

As previously discussed, the SSA includes the entirety of the municipality of Aguadilla. **Section 4.10.1.6** offers a summary of race, ethnicity, and poverty characteristics for the SSA. As discussed above, the minority and low-income populations of the SSA is relatively low compared to the Commonwealth of Puerto Rico, suggesting a low potential for disproportionate effects on these population segments. Based on the analysis completed, neither Alternative 2B or 2D would result in a disproportionately high and adverse impact on minorities, ethnic groups, Tribal nations, or low-income populations.

[29] US Census Bureau. Quick Facts, Aguadilla Municipio Puerto Rico. https://www.census.gov/quickfacts/fact/table/aguadillamunicipiopuertorico/HSG010218#qf-flag-X . Accessed April 27, 2020.

No-Action Alternative

The No-Action Alternative would have no effect on environmental justice.

4.10.2.3. Children's Health and Safety

Neither Alternative 2B nor 2D would result in the acquisition or relocation of any schools, child care centers, or other similar facilities. No schools or child care facilities are located in areas that would be affected by significant changes in noise levels associated with either Alternative. Since there are no schools, daycare centers, or other similar facilities within or adjacent to the DSA and the proposed improvements would be located entirely on the restricted Airport property, both Alternative 2B and 2D are not anticipated to increase environmental health and safety risks or exposures to children in the surrounding community. There would be no disproportionate health and safety risk to children resulting from the Proposed Project.

No-Action Alternative

The No-Action Alternative would not require the acquisition of or relocation of residences, schools, childcare centers, or other similar facilities, and therefore would have no effect on children's health and safety.

4.10.2.4. Surface Transportation

The Proposed Project and its build alternatives would not increase airport capacity and therefore would not result in additional roadway traffic once completed. To determine whether there is a potential for short-term traffic impacts during the construction period, traffic volumes and LOS on major road segments near BQN were considered.

A traffic study using projected CY 2020 traffic utilizing a total of 46 approaches at 10 intersections found that most of the approaches are expected to operate at LOS of C or better under the No-Action Alternative[30]. For signalized intersections, the Highway Capacity Manual[31] describes LOS of C as experiencing average delays greater than 20 to 35 seconds, with a stable flow, and acceptable delays. For unsignalized intersections, LOS C is described as having an average control delay of greater than 15 to 25 seconds. During the AM peak hour, six approaches are projected to operate below LOS of C. During the PM peak hour, four approaches are expected to operate below LOS of C. **Table 4.10-7** depicts intersection approaches expected to operate below LOS of C under projected No-Action CY 2020 traffic conditions.

[30] *Construction Traffic Impact on Surrounding Roadway Study: Rafael Hernandez Airport (BQN), Aguadilla, Puerto Rico*. Marlin Engineering, Inc. July 2018.
[31] *Highway Capacity Manual 2010*. Fifth edition. Transportation Research Board. 2010.

Table 4.10-7 No-Action Intersection Approaches with LOS C or Lower

Intersection	Approach	Delay (Seconds/Vehicle)	LOS
AM Peak Hour			
PR 467 at PR 459	Eastbound STOP-Controlled Approach	1619.3	F
PR 110 at PR 459 North	Eastbound to Northbound Left-Turn	2067.8	F
PR 110 at PR 459 North	Westbound to Southbound Left-Turn	57.3	F
PR 110 at PR 4466	Westbound STOP-Controlled Approach	386.9	F
PR 107 at Engineer Alarcon	Westbound STOP-Controlled Approach	132.3	F
PR 110 at PR 459 South	Eastbound to Southbound Left-Turn	40.5	E
PM Peak Hour			
PR 467 at PR 459	Eastbound STOP-Controlled Approach	864.4	F
PR 110 at PR 459 North	Eastbound to Northbound Left-Turn	149.9	F
PR 110 at PR 4466	Westbound STOP-Controlled Approach	65.2	F
PR 107 at Engineer Alarcon	Westbound STOP-Controlled Approach	94.8	F

Source: Marlin, 2018

Additional analysis performed by AECOM in 2019 examined the effects of construction related traffic on vehicle delay times at the same 10 intersections and 46 approaches. Three intersections would be expected to experience temporary (limited to the construction phase) additional delays due to construction traffic:

- PR 107 at PR 4467 (signalized)
- PR 110 at PR 459 (unsignalized)
- PR 110 at Wing Road (unsignalized)

Table 4.10-8 shows expected temporary changes to vehicle delay and LOS during peak traffic hours at the intersections that would be impacted by construction-related traffic. PR 107 at PR 4467, a signalized intersection, would see additional delays of up to 10 seconds per vehicle during peak hours, reducing overall LOS from B to C on a temporary basis. PR 110 at Wing Road, an unsignalized intersection would be expected to experience less of a delay increase (an average of 9 seconds/vehicle). However, the PM westbound right-turn approach would be expected to decrease from LOS A to C, and the AM and PM westbound left-turn approach would decrease from LOS C to D during peak traffic hours during the construction period. Unsignalized LOS D intersections experience an average of greater than 25 to 35 seconds. The remaining seven intersections in the study area would not be expected to incur additional delays or LOS degradation due to construction traffic. A detailed discussion of traffic analyses conducted for this EA is provided in **Appendix I**.

Table 4.10-8 Alternative 2B and Alternative 2D Construction Traffic Impacts

Intersection	Approach	Delay (Seconds/Vehicle)		LOS	
		No-Action	Alternatives 2B and 2D	No-Action	Alternatives 2B and 2D
PR 107 at PR 4467 (signalized)	Overall	13.1	23.1	B	C
PR 110 at PR 459 (unsignalized)	Eastbound Left-Turn (AM)	2068	2069	F	F
	Westbound Left-Turn (PM)	13.7	14.7	B	B
PR 110 at Wing Road (unsignalized)	Westbound Left-Turn (AM)	21.6	30.6	C	D
	Westbound Right-Turn (AM)	12.6	21.6	B	C
	Southbound Left-Turn (AM)	7.4	16.4	A	B
	Westbound Left-Turn (PM)	19.6	28.6	C	D
	Westbound Right-Turn (PM)	9.8	18.8	A	C
	Southbound Left-Turn (PM)	7.6	16.6	A	B

Sources: Marlin 2018, AECOM 2019

While there would be expected impacts to three intersections, the impacts would be limited to the duration of the construction phase and would represent an additional delay of between 1 and 10 seconds per vehicle, which would not result in degradation of LOS to unacceptable levels or in disruption of local traffic patterns. **Section 4.10.2.5** discusses recommended construction traffic haul routes which would help to reduce these temporary impacts by avoiding the affected intersections.

4.10.2.5. Avoidance, Minimization and Mitigation Measures

As previously discussed, the Proposed Project would affect a total of 69 residential structures on 110 residential parcels. These areas are not included in a Part 150 program and mitigation would be required. The relocation of Runway 8-26 and associated air traffic would require the purchase of 101 avigation easements for the parcels that would experience a 3 dB or greater increase within the new DNL 60 dB noise contour resulting from either Action Alternative. Sound insulation of affected properties is a commonly used method to mitigate airport related noise. This option was explored as a mitigation method for the Proposed Project, but was determined to be infeasible due to the fact that the existing frames/foundations of many houses in the area are not conducive to receiving effective sound insultation improvements, and that many would not be readily able to meet building code regulations that would enable the level of structural modifications necessary to achieve the necessary sound reduction. Additional mitigation methods would be offered to affected residential parcel owners and include a sales assistance program, and purchase

assurance program, all with an associated avigation easement, as well as an avigation easement program. The choice of purchase assurance or sales assistance are measures with which to assist homeowners who prefer to move from the noise and air traffic impacted areas facilitate a timely market sale of impacted properties (see **Section 4.9.2.1**). With the availability and implementation of these mitigation options, the residents of affected properties would not be considered "displaced persons" under the Uniform Act if they choose to relocate in response to the Proposed Project's implementation.

The nine parcels that would experience a 1.5 dB or greater increase within the new DNL 65 dB resulting from the Proposed Project would be purchased under fee-simple interest by the Airport Sponsor. Residents of these parcels would be considered "displaced persons" under the Uniform Act and therefore would be eligible for relocation assistance under the Act. AC 150/5100-17 Change 6 provides guidance to sponsors of airport projects developed under the AIP to meet the requirements of the Uniform Act when property acquisition is required for a Proposed Project. All property acquisition required to support land use compatibility with the Proposed Project would be performed accordance with AC 150/5100-17, including provisions and requirements for real property appraisal, real property acquisition, relocation assistance, payments for moving and related expenses, replacement housing payments, and management of acquired properties.

Property acquisitions would need to be completed in compliance with the Uniform Act. Pertinent sections of the Uniform Act, codified at 42 U.S.C. Chapter 61, are as follows:

- 42 U.S.C. §4622(a): The affected landowner must be reimbursed for actual reasonable expenses in moving himself, his family, or other personal property. The landowner is due compensation for actual direct losses of tangible personal property as a result of moving or discontinuing a business or farm operation, but not to exceed an amount equal to the reasonable expenses that would have been required to relocate such property, as determined by the FAA.

- 42 U.S.C. §4622(b): Any displaced person eligible for payments under subsection (a) of this section who is displaced from a dwelling and who elects to accept the payments authorized by this subsection in lieu of the payments authorized by subsection (a) of this section may receive an expense and dislocation allowance, which shall be determined according to a schedule established by the head of the lead agency.

- 42 U.S.C. §4651(1): The FAA/Airport Sponsor shall make every reasonable effort to acquire expeditiously real property by negotiation.

- 42 U.S.C. §4651 (2): Real property shall be appraised before the initiation of negotiations, and the owner or his designated representative shall be given an opportunity to accompany the appraiser during his inspection of the property, except that the FAA may prescribe a procedure to waive the appraisal in cases involving the acquisition by sale or donation of property with a low fair market value.

- 42 U.S.C. §4651(3): Before the initiation of negotiations for real property, the FAA/Airport

Sponsor shall establish an amount which is believed to be just compensation therefore and shall make a prompt offer to acquire the property for the full amount so established. In no event shall such amount be less than the FAA approved appraisal of the fair market value of such property. Any decrease or increase in the fair market value of real property prior to the date of valuation caused by the public improvement for which such property is acquired, or by the likelihood that the property would be acquired for such improvement, other than that due to physical deterioration within the reasonable control of the owner, will be disregarded in determining the compensation for the property. The FAA/Airport Sponsor shall provide the owner of real property to be acquired with a written statement of, and summary of the basis for, the amount he established as just compensation. Where appropriate the just compensation for the real property acquired and for damages to remaining real property shall be separately stated.

- 42 U.S.C. §4651(5): No person lawfully occupying real property shall be required to move from a dwelling (assuming a replacement dwelling as required by subchapter II will be available), without at least ninety days' written notice from the head of the FAA/Airport Sponsor, of the date by which such move is required.

- 42 U.S.C. §4651 (6): If the FAA/Airport Sponsor permits an owner or tenant to occupy the real property acquired on a rental basis for a short term or for a period subject to termination by the Government on short notice, the amount of rent required shall not exceed the fair rental value of the property to a short-term occupier.

- 42 U.S.C. §4651(8): If any interest in real property is to be acquired by exercise of the power of eminent domain, the FAA shall institute formal condemnation proceedings. No Federal agency head shall intentionally make it necessary for an owner to institute legal proceedings to prove the fact of the taking of their real property.

- 42 U.S.C. §4651(9): if the acquisition of only a portion of a property would leave the owner with an uneconomic remnant, the FAA/Airport Sponsor shall offer to acquire that remnant. For the purposes of this chapter, an uneconomic remnant is a parcel of real property in which the owner is left with an interest after the partial acquisition of the owner's property and which FAA concerned has determined has little or no value or utility to the owner.

With compensation and the implementation of regulatory provisions outlined in the Uniform Act described in this section, overall socioeconomic effects associated with either Action Alternative are expected to become less-than-significant.

Potential impacts to traffic during the construction phase could be minimized by utilizing the following recommended haul routes, particularly during AM and PM peak traffic hours:

- Use PR-107 south, turn east onto PR-2, follow PR-2 to PR-110 north to travel from the airport construction site to the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport.

- Use PR-110 south, turn west onto PR-2, follow PR-2 to PR-107 north to travel from the locations of the bituminous concrete plant, landfill, and borrow site along PR-110 southeast of the airport to the airport construction site.

4.11. WATER RESOURCES (INCLUDING SURFACE WATER AND GROUNDWATER)

4.11.1. AFFECTED ENVIRONMENT

4.11.1.1. Hydrology

Hydrology of the Aguadilla region is typical of karst areas and is characterized by few surface water drainage features.[32] According to the topographic survey, the stormwater collection system at BQN consists of grates, inlets and reinforced concretes pipes that vary in size from 12 to 54 inches in diameter. Runoff at BQN drains superficially in laminar form or by earth's channels towards the collection system and ultimately to the ocean. The topographic survey also detected depressions on Airport property that were identified as sinkholes.

4.11.1.2. Groundwater

Groundwater is considered a minor source of water for the Aguadilla region and mostly occurs within the water-table aquifer that extends throughout the North Coast Province. The water-table aquifer in the Aguadilla region is comprised of rocks of the Aymamón Limestone and the Los Puertos Formation. The Aymamón limestone is the most important part of the aquifer in the north because the Los Puertos lies below the freshwater/saline water interface near the coast. In the south, the Los Puertos is the most important part of the aquifer because the Aymamón is unsaturated in that area. The estimated freshwater-saturated thickness of the water-table aquifer ranges from zero at the southern limit of the aquifer to over 600 feet, south of Isabela. Due to the high, average annual rainfall (60 to 80 inches per year), lack of surface drainage features, and the highly developed karst topography in the highlands, recharge to the groundwater system often occurs through the substantial infiltration of rainfall. Discharge from the groundwater system leaks to streams and to the sea.[33]

4.11.1.3. Water Supply and Treatment

Over 97% of Puerto Rico receives public water services from the PRASA. The water requirements were more than 3.83 MGD in 2015, of which 3.47 MGD were withdrawn from surface water and 0.36 MGD from groundwater. Estimated water usage for non-PRASA–supplied water is only 0.07 MGD, all of which is from groundwater. Approximately 1.1% of Puerto Rico depends on private wells or springs for household water needs.[34]

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[32] Tucci, P. and Martinez, M. *Hydrology and Simulation of Groundwater Flow in the Aguadilla to Rio Camuy Area, Puerto Rico, Water-Resources Investigations Report 95-4028.* US Geological Survey. 1995.

[33] Tucci, P. and Martinez, M. *Hydrology and Simulation of Groundwater Flow in the Aguadilla to Rio Camuy Area, Puerto Rico, Water-Resources Investigations Report 95-4028.* US Geological Survey. 1995.

[34] US Geological Survey. 2015 Water Use Data for Puerto Rico: Aguadilla Municipio. Accessed on October 2, 2019 from https://waterdata.usgs.gov/pr/nwis/water_use.

4.11.2. ENVIRONMENTAL CONSEQUENCES

The analysis of potential impacts to water quality was prepared in accordance with the principal objectives of the Federal Water Pollution Control Act and subsequent CWA, which are to restore and maintain the chemical, physical, and biological integrity of national waters. A qualitative evaluation of potential water quality impacts was performed by reviewing Federal, state, and local regulations and analyzing the current drainage system.

4.11.2.1. Construction Impacts

The general drainage pattern and drainage systems at BQN would remain as described in **Section 4.11.1.** Changes to the existing drainage system within the footprint of either retained alternative would occur with the addition of new impervious area. Within the footprint of either Alternative 2B or 2D, approximately 85 acres of new impervious area would be constructed at the Airport. Approximately 446 acres of land would be disturbed by clearing, excavation, and construction activities associated with each retained alternative. Therefore, short-term and temporary water quality impacts may result from construction activities. The potential impacts may include increases in sedimentation and turbidity during rainfall events. Since these activities would also involve the use of vehicles and equipment, fuels and lubricants, and the storage of construction materials, there is a risk of release or spills of construction-related hazardous materials or petroleum substances. In this regard, both Alternative 2B and 2D have the potential to exceed applicable Puerto Rico water quality standards promulgated in Puerto Rico's Water Quality Standards Regulations (Rule 1303.1). This potential exists as areas of disturbed land would be exposed to rainfall, which could result in stormwater discharges with suspended solids and sediment transport in excess of applicable water quality standards. Turbidity and sedimentation have the potential to adversely affect water quality, aquatic organisms, and benthic habitats. Alternatives 2B and 2D are also expected to involve the use of fuels, lubricants, solvents, paints, and other materials during construction. A release, spill, or improper storage would have the potential to introduce these materials and substances into surface waters in excess of Puerto Rico's water quality standards.

In relation to the possible sinks at the Airport, this would represent that at present part of the stormwater runoff drains through them. If the footprint of either retained alternative covers the possible sinks, then the existing collection system may receive an increase in runoff. Therefore, the capacity of the main 36- and 54-inch pipes would have to be analyzed to see if they have the capacity to manage the increase in discharge. Likewise, the impact at the point of discharge, outside the limits of the Airport, would have to be evaluated.

Though Alternatives 2B and 2D have some potential to exceed applicable water quality standards during construction, the use of project-specific BMPs; implementation of erosion control measures specified in FAA AC 150/5370-10H; acquiring necessary permits, and the implementation of project-specific design criteria to minimize erosion and sedimentation would prevent and/or minimize potential water quality impacts. As a result of these control measures, significant and

long-term water quality impacts resulting from construction activities associated with Alternative 2B or 2D would not occur.

There is a possibility of the release of contaminants to groundwater during construction. However, project-specific BMPs and Stormwater Pollution Prevention Plans (SWPPPs) to be designed for the proposed project would prevent or minimize the potential release of contaminants into groundwater. The BMPs and SWPPPs would require measures to prevent spills, provide swift response to accidental spills, and define acceptable on-site storage of fuel and lubricants (see **Section 4.11.2.3** for further discussion on avoidance and minimization measures). Given the availability of regionally-accepted BMPs and the design of project-specific plans, neither of the retained alternatives would have a substantial impact on groundwater resources.

No-Action Alternative

Under the No-Action Alternative, conditions and operations at BQN would remain the same and no construction activities would occur. Therefore, the No-Action Alternative would have no effect on the surface and groundwater resources in the area.

4.11.2.2. Operational Impacts

The pollutants associated with stormwater runoff from parking lots, roadways, aircraft aprons, runways, and taxiways such as oils, greases, heavy metals and other pollutants associated with industrial activity at airports are expected to increase with the construction of either Alternative 2B or 2D. Most of the pollutants from stormwater runoff will be from areas where industrial activity occurs such as aircraft fueling, maintenance facilities, storage facilities, parking lots, roadways, etc. Pollutants from stormwater runoff from the proposed runway reconstruction and taxiway will be in low concentrations where it can be considered a minimal impact. The existing site-specific SPCC plan for the site would need to be revised to reflect changes in configuration in order to minimize the risk of an accidental discharge to surface or groundwater.

No-Action Alternative

Under the No-Action Alternative, conditions and operations at BQN would remain the same and no construction activities would occur. Therefore, the No-Action Alternative would have no effect on the surface and groundwater resources in the area.

4.11.2.3. Avoidance, Minimization and Mitigation Measures

Runoff from activities at BQN is regulated by the EPA as “stormwater discharges associated with industrial activity.” Applicable requirements for airports are presented in the EPA's Multi-Sector General Permit (MSGP) for stormwater associated with industrial activities. These requirements include submittal of a *Notice of Intent* for coverage under the MSGP and the preparation and implementation of a site-specific SWPPP, incorporating structural and non-structural BMPs aimed at reducing the risk of stormwater pollution. Proper implementation of the BMPs prescribed by the SWPPP will minimize the risk of stormwater pollution associated with the operation of the new

facilities. Regionally-accepted construction BMPs to minimize stormwater exposure to pollutants may include containing sanitary residues (i.e., containment of portable toilets); locating oil storage and handling away from storm drains and waterways; and contain and cover construction waste.[35] Regionally-accepted construction BMPs to minimize sedimentation in nearby waterways may include sediment barriers (i.e., silt fence); stabilize construction entrances (i.e., gravel platform with geotextile fabric); protect storm drain inlets; implement temporary and permanent stabilization of the project (i.e., hydroseeding) to reduce runoff.[36] The SWPPP will be prepared as part of the design and permitting phase detailing specific BMPs authorized by the permitting agencies.

4.12. CUMULATIVE EFFECTS

The regulations that implement NEPA define cumulative impacts as an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local), private entities, or individuals. An assessment of cumulative impacts is required to properly assess the environmental impacts of a proposed action. This requires considering expected environmental effects from the combined impacts of past, current, and reasonably foreseeable future activities that may affect any part of the human or biological environment affected by the Proposed Project.

A review of Proposed Project records for the BQN area was conducted as part of the cumulative impacts review process. Projects in Puerto Rico that may have a significant impact on the environment are required to undergo an environmental review process that is managed by the EQB. Projects that are expected to result in major environmental impacts are required to prepare an EIS as part of their planning process. A review of EIS documents for the years 2008-2013 was conducted using the EQB website. The review showed that no major projects that would impact the BQN area have been presented during the review period.

The Proposed Project is part of the operational area of BQN. The possibility of future projects in the immediate vicinity of the DSA was evaluated as part of the cumulative impacts analysis. Any future projects including facilities related to the operation of the Airport, such as new hangars and aircraft service, would be compatible with the present land use and activities at BQN. The environmental impacts of any such projects would be minor and essentially limited to the construction phase, as is the case of the Proposed Project. The 2020 PRPA Capital Improvement

[35] EPA, 2018. NPDES: Puerto Rico Construction Best Management Practices (BMPs) Fact Sheets: Pollution Prevention BMP Fact Sheet. https://www.epa.gov/sites/production/files/2018-11/documents/pr_esa_factsheet_2_hoja_informativa_sobre_prevencion_de_la_contaminacion.pdf

[36] EPA, 2018. NPDES: Puerto Rico Construction Best Management Practices (BMPs) Fact Sheets: Sediment and Erosion Control BMP Fact Sheet. https://www.epa.gov/sites/production/files/2018-11/documents/pr_esa_factsheet_1_hoja_informativa_sobre_control_de_sedimentacion_y_erosion.pdf

Program lists two planned projects at BQN, in addition to the Proposed Project, between 2020 and 2025.

A search was performed of currently active, planned, and proposed development projects within Aguadilla Municipality to assess possible cumulative effects and interactions when considered with impacts from the Proposed Project. **Table 4.12-1** presents a list of both airport-related and other projects within the vicinity of BQN, project timeframes relative to the Proposed Project construction period, and the potential resource interactions. Potential impacts from the majority of the active, planned, and proposed projects would be limited to construction duration, would be minor, and therefore would not constitute significant cumulative effects when considered with impacts incurred by the Proposed Project. Several of the planned and proposed projects that are not associated with BQN have the potential to incur long-term impacts (e.g. roadway extensions and residential and resort development). However, because the Proposed Project would not result in long-term impacts to most environmental resources, it is unlikely that the Proposed Project, when considered with other regional projects, would result in significant cumulate effects.

None of the projects considered for the cumulative impacts analysis is dependent upon or directly associated with the Proposed Project, and therefore are not considered connected actions. One proposed regional project includes access improvements from highway PR-110 to BQN. This project would be undertaken by the Public Works Puerto Rico Highway and Transportation Authority, and is proposed as part of a region-wide Transportation Improvement Program (TIP). The TIP is designed to enhance the access, safety, and efficiency of the regional transportation system. Improved roadway efficiency may result in a long-term decrease in impacts to certain environmental resources, including air quality and climate.

No significant cumulative impacts have been identified as a result of this cumulative impacts review. It is possible that, in the distant future, some major project that may affect BQN and its vicinity may be proposed, but the nature and extent of such future projects cannot be predicted at the present time. The No-Action Alternative would have no associated cumulative impacts . The overall environmental impacts associated with the construction and operation of the Proposed Project and the build alternatives are expected to be minimal. It is, therefore, unlikely that the Proposed Project will significantly contribute to cumulative adverse impacts in the area.

Table 4.12-1 Regional Projects Considered for Cumulative Effects Analysis

Proponent/ Location	Action	Description	Timeframe	Potential Resource Interaction
Puerto Rico Port Authority/BQN	Airport Property Fence Rehabilitation	As indicated by title.	Present	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Socioeconomics, Environmental Justice and Children's Health and Safety Risks
Puerto Rico Port Authority/BQN	New Cargo Apron South Area	Construction of new cargo apron on south side of airfield.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Island-wide	Pavement Rehabilitation and Reconstruction of Roads	As indicated by title.	Past, Present, Future	Air Quality; Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Island-wide	Rehabilitation and Replacement of Critical Bridges	As indicated by title.	Past, Present, Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)

Proponent/ Location	Action	Description	Timeframe	Potential Resource Interaction
Puerto Rico Highway and Transportation Authority/Island-wide	Highway Safety Improvements	Addition of signals, medians, guardrails and other safety features.	Past, Present, Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Socioeconomics, Environmental Justice and Children's Health and Safety Risks
Puerto Rico Highway and Transportation Authority/Aguadilla	Widening of PR-111, from PR-444 to PR-423	As indicated by title.	Past	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Island-wide	Permanent Repairs in Puerto Rico funded by FEMA	Repairs to hurricane damaged transportation infrastructure.	Past, Present	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Aguadilla	Pavement Reconstruction at PR-2 from Km 125.5 to Km 125.9, Aguadilla, PR	As indicated by title.	Present	Air Quality; Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands,

Proponent/ Location	Action	Description	Timeframe	Potential Resource Interaction
				floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transport Authority/Aguadilla	Access Improvements to Aguadilla Airport (Proposed)	Access Improvements to Aguadilla Airport, from PR-110 to PR-107, Includes Burns Street Connector.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Hatillo - Aguadilla	Extension PR-22 from PR-22/PR-2 to PR-2/PR-111 (Proposed)	Extend PR-22 to connect PR-2 to PR-111.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Aguadilla	Safety Improvements to PR-459 with PR-110 Ramps (Proposed)	Convert the intersection of PR-110 Northwest off-ramp with PR-459 from a stop control to a traffic signal to provide efficient and safe traffic operations for forecasted traffic volumes.	Future	Air Quality; Climate; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks

Proponent/ Location	Action	Description	Timeframe	Potential Resource Interaction
Puerto Rico Highway and Transportation Authority/Aguadilla	Safety and Operational Improvements to the Intersection of PR-459 and PR-463 (Proposed)	Create a left turn and right turn lane on PR-463 to provide safe connectivity to the Inter-American University. Includes the addition of one lane for the westbound approach of the intersection of PR-459 with PR-463, in order to have one left- and one right-turn lane.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Aguadilla	Improvements to PR-107 Intersection with E Street (Proposed)	Convert intersection of PR-107 with E Street from a stop control to a traffic signal. Proposed in response to expected increase in traffic volumes due to future development of the Airport Region and the Tourist Interest Zone.	Future	Air Quality; Climate; Hazardous Materials, Pollution Prevention and Solid Waste; Socioeconomics, Environmental Justice and Children's Health and Safety Risks
Puerto Rico Highway and Transport Authority/Aguadilla	Roundabout PR-110 with PR-2 Right Turn Slip Lane (Proposed)	Convert intersection of PR-2 right-turn ramp slip lane with PR-110 from a stop control to a modern roundabout to comply with Federal Highway Administration's Every Day Counts initiatives.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Highway and Transportation Authority/Aguadilla	Develop Bicycle and Pedestrial Infrastructure (Proposed)	Develop safe and efficient pedestrian and bicycle infrastructure linking Aguadilla districts, recreational facilities, and transit nodes.	Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)

Proponent/ Location	Action	Description	Timeframe	Potential Resource Interaction
Caribbean Management Group/Playuela, Aguadilla	Christopher Columbus Landing Resort	Develop new resort including a 300-room hotel and 100 tourist villas.	Present, Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)
Puerto Rico Beach Properties/Costa del Sol, Aguadilla	Unnamed Development	Permits approved for 200-acre development including 720 multifamily condo-hotel , 125 single family lots, spa & gym, 125 tourist villas, mini-grocery store, 160 hotel rooms, sport facilities and passive recreation areas.	Present, Future	Air Quality; Biological Resources (including fish, wildlife, and plants); Climate; Coastal Resources; DOT Section 4(f) Resources; Hazardous Materials, Pollution Prevention and Solid Waste; Historical, Architectural, Archaeological, and Cultural Resources; Land Use; Noise and Noise Compatible Land Use; Socioeconomics, Environmental Justice and Children's Health and Safety Risks; Visual Effects (Including light emissions); Water Resources (including wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers)

Sources: PRPA, 2020 Capital Improvement Program. 2020; Puerto Rico Department of Transportation and Public Works Puerto Rico Highway and Transportation Authority, Transportation Improvement Program (TIP) Fiscal Year 2019-2022. March 4, 2019; Autonomous Municipality of Aguadilla, Comprehensive and Feasibility Transportation Study for the Municipality of Aguadilla. November 2016; https://globalpressjournal.com/americas/puerto-rico/amid-protest-resort-construction-begins-puerto-rican-region-known-biodiversity/;
https://www.puertoricobeachproperties.com/Aguadilla/Puerto_Rico/Lots_and_Land/Beachfront/Agent/Listing_3924874.html.

CHAPTER 5 COORDINATION AND PUBLIC INVOLVEMENT

5.1. INTRODUCTION

Early agency coordination and a public involvement program were implemented to ensure information regarding the proposed airport development and potential environmental impacts were made available to the general public and public agencies and that input from interested parties was received and considered in the development of this EA. The primary components of the agency and public participation program for this EA include:

- Public and agency Scoping at the beginning of the NEPA process,
- Publication of the Draft EA for public and public agency review,
- A virtual public information website; and
- Public notice of the FAA's decision of whether to issue a FONSI or to prepare an EIS.

The following summarizes the public involvement and review process.

5.2. AGENCY EARLY COORDINATION

Federal, state, and local agencies were provided early notice of the Proposed Project and preparation of this EA on July 20, 2018. In addition, an early agency scoping meeting was held by the FAA and PRPA at BQN on August 1, 2018 subsequent to the FAA issuing the early scoping notification letters and project information to interested agencies. A variety of Federal, state and local agency representatives attended this meeting either telephonically or in person (see **Appendix C** for sign-in sheet), where the PRPA and AECOM briefed the attendees on the project, alternatives and EA process. Comments on the early notice were received either by email or by written correspondence from the following Federal, state and local agencies:

- City of Aguadilla
- DNER
- PREPA
- PRPB
- Puerto Rico Tourism Company
- USFWS

The agency comments received during the early scoping process are provided in **Appendix C**.

5.3. DRAFT EA AVAILABILITY FOR REVIEW

The Draft EA was made for review by the general public and interested parties. The public comment period on the Draft EA extended until August 24, 2020. Notification of the document's availability was advertised through newspapers of regional and local circulation. The Notice of

Availability was published on July 23, 2020, more than 30 days prior to the close of the public comment period. **Appendix J.1** contains a copy of the Notice of Availability. Copies of the Draft EA were also distributed to Federal, state and local agencies that participated in the early coordination period. Letters notifying the availability of the Draft EA were also submitted to Federal, state and local agencies. A list of agencies that received the Draft EA and notification letters is provided in **Appendix J.2**.

A hard copy of the Draft EA was placed on display for inspection at the Rafael Hernandez Airport, Main Terminal, Hangar 405, Floor 1, at Aguadilla, Puerto Rico. An electronic copy of the Draft of the EA was made available for public review at www.prpa.pr.gov, under the section “Avisos”. The document was also made available for public review, along with additional public information display materials, on the project's virtual information website https://BQNRunwayEA.consultation.ai/. Copies of the Draft EA were also distributed to Federal, state and local agencies. A list of agencies receiving the Draft EA is provided in **Appendix J.2**.

5.4. HOW TO COMMENT

Anyone wishing to comment on the information and conclusions in the Draft EA were invited to do so in writing at any time during the advertised public review and comment period. There were three options available to comment:

1 Complete a virtual comment form at https://BQNRunwayEA.consultation.ai by August 24, 2020.

2 Send comments via email to: BQNRunwayEA@prpa.pr.gov, until August 24, 2020

3 Provide written comment, postmarked no later than August 24, 2020 to the following address:

Puerto Rico Ports Authority
Attention: Eng. Romel Pedraza
P.O. Box 362829
San Juan, P.R. 00936-2829

5.5. COMMENTS ON THE DRAFT EA

The Draft EA comment period began on July 23, 2020 and closed on August 24, 2020. During this period, no comments were received.

5.6. FINAL EA

The Draft EA was revised as necessary to summarize and incorporate all comments received during the public and agency review period. PRPA and the FAA considered all comments received from agencies and organizations in development of the Final EA. Summaries of comments received, responses, and any necessary revisions to the EA were incorporated into the Final EA.

CHAPTER 6 LIST OF PREPARERS

As required by FAA Order 5050.4B, the names and qualifications of the principal persons contributing information to this EA are identified. It should be noted, in accordance with § 1502.6 of the CEQ regulations, the efforts of an interdisciplinary team, consisting of technicians and experts from various fields of study were required to accomplish this study. Specialists involved in this EA included those in such fields as airport planning; biology; historic/archaeological; water resources; and other disciplines.

AECOM - PRIME CONSULTANT

Paul Sanford – Project Manager (Tampa)/Airport Environmental Planner. B.S. Environmental Science and Policy. 11 years of experience.

Tia Norman – Aviation Environmental Planner. B.S. Environmental Science. 11 years of experience.

Sam Hartsfield – Aviation Environmental Planner. M.S. Environmental Science and Management. B.S. Biology. 14 years of experience.

Robert Morris – Senior CAD Specialist. 34 years of experience.

Kevin Gu – Traffic Engineer PE, PTOE. M.S. Civil Engineering.

Mark Martinkovic – Senior Archaeologist. M.A. and B.A. Archaeology and Historical Archaeology. 15 years of experience.

Marvin Brown – Senior Architectural Historian and Historian**.** B.A. and M.A. American Civilization, J.D. Law. 35 years of experience.

Daniel Botto –Airport Environmental Planner. B.S. Aviation Business Administration. 21 years of experience.

Victor Morales – Project Manager (San Juan)

Joe Rodriguez – Environmental Planner

MARLIN ENGINEERING, INC. - SUBCONSULTANT

REFORESTA - SUBCONSULTANT