



DRAFT ENVIRONMENTAL ASSESSMENT

Runway 11-29 Safety Area Improvements

Igor I. Sikorsky Memorial Airport (BDR)

Stratford, Connecticut

March 2022



Prepared
For:



Prepared By:



DRAFT ENVIRONMENTAL ASSESSMENT
RUNWAY 11-29 SAFETY AREA IMPROVEMENTS

IGOR I. SIKORSKY MEMORIAL AIRPORT
Stratford, Connecticut

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As Lead Federal Agency pursuant to the National Environmental Policy Act of 1969

MARCH 2022

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed federal action is consistent with existing national policies and objectives as set forth in Section 101 of the National Environmental Policy Act (NEPA) and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 101 (2) (c) of the NEPA. This environmental assessment becomes a federal document when evaluated, signed, and dated by the responsible Federal Aviation Administration (FAA) official.

Responsible FAA Official

Date

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LIST OF ACRONYMS

AC	Advisory Circular
AEDT	Aviation Environmental Design Tool
AIP	Airport Improvement Plan
ALP	Airport Layout Plan
APE	Area of Potential Effect
ARC	Airport Reference Code
ASDA	Accelerate-stop Distance Available
CAA	Clean Air Act
CCMA	Connecticut Coastal Management Act
CEQ	Council on Environmental Quality
CGS	Connecticut General Statutes
CJL	Coastal Jurisdiction Line
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEEP	Connecticut Department of Energy and Environmental Protection
DME	Distance Measuring Equipment
DNL	Day-night Average Noise Level
DOT	Department of Transportation
EA	Environmental Assessment
EFH	Essential Fish Habitat
EJ	Environmental Justice
EMAS	Engineered Materials Arresting System
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FEMA	Federal Emergency Management Agency
HIRL	High Intensity Runway Lights
HTL	High Tide Line
ILS	Instrument Landing System

IPaC	USFWS Information for Planning and Conservation
LDA	Landing Distance Available
LWCF	CT DEEP Land and Water Conservation Fund
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NDDB	National Diversity Database
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NOP	National Offload Program
PAPI	Precision Approach Pathway Indicator
RDC	Runway Design Code
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SWPPP	Stormwater Pollution Prevention Plan
TODA	Takeoff Distance Available
TORA	Takeoff Run Available
TOY	Time of Year
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
VOR	Very High Frequency Omni-directional Range

1 INTRODUCTION

This Environmental Assessment (EA) documents the evaluation of potential impacts associated with proposed safety improvements to Runway 11-29 at Igor I. Sikorsky Memorial Airport (BDR). This EA was prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969 to address potential impacts associated with upgrades to the Runway Safety Area and proposed tree obstruction removal while providing the opportunity for public involvement and comments. The proposed improvements will improve and enhance safety but not change the runway's length, width, or strength. The study was conducted in accordance with Federal Aviation Administration (FAA) guidelines, including:

- *Environmental Desk Reference for Airport Actions (Version 2, 2020)*
- *FAA Order 1050.1F: Environmental Impacts: Policies and Procedures*
- *FAA Order 5050.4B: National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*

Since the proposed action would require federal approval and funding determinations by the FAA, the EA must comply with NEPA and other federal special-purpose laws.

This EA includes the following chapters:

- Chapter 1: Introduction
- Chapter 2: Purpose and Need
- Chapter 3: Alternatives
- Chapter 4: Affected Environment
- Chapter 5: Environmental Consequences
- Chapter 6: Public Outreach
- Chapter 7: List of Preparers

1.1 AIRPORT OVERVIEW

Igor I. Sikorsky Memorial Airport (BDR) is a public-use airport owned by the City of Bridgeport, Connecticut. According to the FAA's 2021 – 2025 National Plan of Integrated Airport Systems (NPIAS) report, BDR is designated as a General Aviation (GA) airport and is classified with a role of "national." As defined within the NPIAS, a national airport "*supports the national airport system by providing communities access to national and international markets in multiple states and throughout the U.S. National airports have very high levels of aviation activity with many jets and multiengine propeller aircraft.*" The other FAA airport categories include Regional, Local, Basic, and Unclassified. Of the nearly 3,000 public airports in the study, only 84 airports were of National Importance. Although scheduled airlines are not provided at BDR, the airport maintains a commercial operating certificate under Part 139.

BDR is in the Town of Stratford, Connecticut, and is approximately three miles southeast of the City of Bridgeport. Bridgeport and Stratford are in Fairfield County, approximately 15 miles from New Haven and 60 miles from New York City (Midtown Manhattan). Figure 1-1 depicts the location of BDR relative to southwestern Connecticut and the Long Island Sound.



Igor I. Sikorsky Memorial Airport



NOT TO SCALE



Figure 1-1
Airport Location

1.1.1 Airside Facilities

BDR operates under a two intersecting runway system consisting of a main runway and a crosswind runway. Runway 11-29 is 4,761-feet long and 150-feet wide (see Figure 1-2). It is constructed of asphalt and in fair to poor condition. According to the FAA Facility Directory, the runway’s load-bearing capacity is estimated at 30,000 pounds for single wheel aircraft and 108,000 pounds for double wheel aircraft. Runway 11 end maintains basic markings, while Runway 29 maintains non-precision markings. Both are in fair condition.

Runway 6-24 was reconstructed in 2016 and is 4,677 feet in length and 100 feet in width. It is constructed of asphalt and in excellent condition. As per the FAA Facility Directory, the runway’s load-bearing capacity is estimated at 57,000 pounds for single wheel aircraft and 80,000 pounds for double wheel aircraft. The Runway 6 end maintains precision markings in good condition, while the Runway 24 end maintains non-precision markings, also in good condition. Table 1-1 presents the runway characteristics.

Table 1-1: BDR Runway Characteristics

	Runway 11-29		Runway 6-24	
Runway Length (feet)	4,761'		4,677'	
Displaced Threshold (feet)	0	364'	0	320'
Width (feet)	150'		100'	
Runway End Elevation (feet above MSL)	8.5'	6.5'	6.9'	6.8'
Pavement Type	Asphalt		Asphalt/Grooved	
Pavement Load Bearing	108,000 lbs.		80,000 lbs.	
Effective Runway Gradient	0.04%		0.01%	
Aircraft Approach Category	C		C	
Airplane Design Group	III		II	
Runway Markings	Basic/Non-Precision		Precision/Non-Precision	
Runway and Approach Lighting	HIRL, REIL, PAPI-4		HIRL, REIL, PAPI-4	
Navigational Aids	n/a	RNAV	ILS/DME, RNAV	RNAV, VOR
Runway Design Code	C-III-5000		C-II-4000	C-II-5000

Source: BDR Airport Master Plan, CHA 2021.

An aircraft operation is defined as either a landing or a takeoff. Thus, each flight includes at least two operations: one takeoff and one landing. According to data provided by the Air Traffic Control Tower, there were approximately 55,000 annual operations at BDR in 2019, which amounts to an average of 75 landings per day. Of that total, itinerant and local operations were approximately split evenly. Local flights are conducted mostly by based aircraft and primarily include single- and multi-engine piston aircraft conducting training and recreational flights. Itinerant operations (i.e., those arriving from outside the local area) are conducted by a mix of based and transient or visiting aircraft. These operations are conducted by all sizes of general aviation aircraft up to large business jets.

1.1.2 Runway Classification



The FAA uses a classification system, known as the Airport Reference Code (ARC), to signify the airport’s highest Runway Design Code (RDC), the design standards to which the runway is to be built. RDC consists of three components:



Legend

--- Airport Property Line

Igor I. Sikorsky Memorial Airport

0 450 900 1800 Feet

Sources: Imagery (esri/State of CT., 2019)


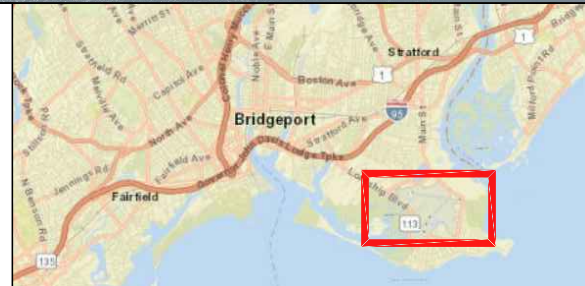



Figure 1-2
Airport Layout

- Aircraft approach speed
- Airplane design group relating to either the aircraft wingspan or tail height, whichever is more restrictive
- Visibility minimums

The overall ARC is determined by taking the highest RDC minus the visibility component. ARC affects runway and taxiway dimensions, separation standards, pavement marking standards, and other safety standards. Furthermore, it is used for airport planning and design but does not limit the aircraft that may be able to operate safely at the airport. The relationship between the ARC and design standards is further described in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design* and summarized in Table 1-2. According to the BDR Airport Layout Plan (ALP), BDR is currently designated with an ARC C-III.

Table 1-2: FAA Airport Reference Code Classification

Approach Categories			
Approach Category	Airspeed (Knots)		Example Aircraft
A	<91		Cessna 152
B	91 ≤ 121		Citation X
C	121 ≤ 141		Gulfstream 450
D	141 ≤ 166		Boeing 757
E	166+		B-2 Spirit
Airplane Design Group			
Design Group	Tail Height (feet)	Wingspan (feet)	Example Aircraft
I	<20	<49	Piper Cherokee
II	20-<30	49 ≤ 79	King Air B250
III	30-<45	79 ≤ 118	Gulfstream 550
IV	45-<60	118 ≤ 171	Boeing 757
V	60-<66	171 ≤ 214	Boeing 747
VI	66-<80	214 ≤ 262	Airbus A380

Source: FAA AC 150/5300-13A *Airport Design*, CHA, 2021.

1.2 NON-STANDARD CONDITIONS

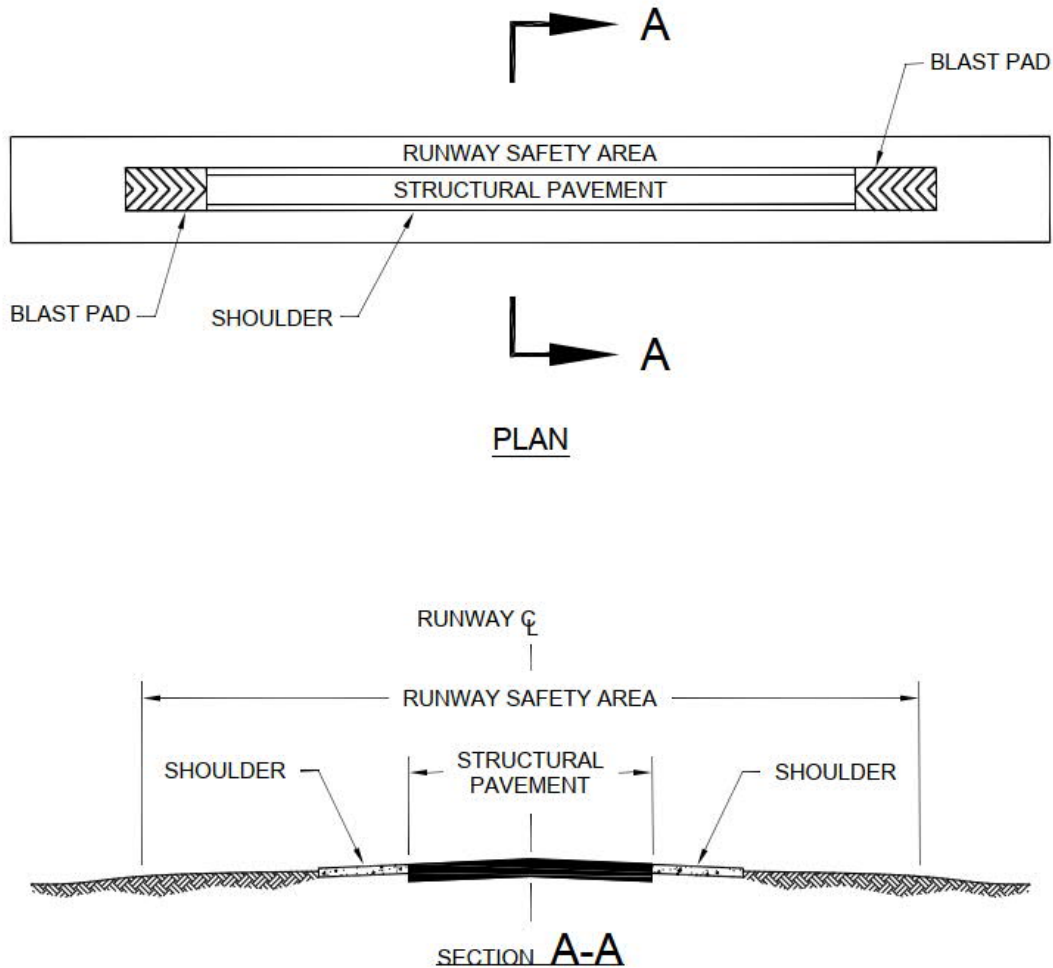
Although Runway 11-29 currently has a C-III ARC, it does not fully comply with C-III design standards. AC 150/5300-13A identifies safety areas and zones surrounding runways and taxiways that must be protected from foreign objects, hazards, or obstacles that may impact safety. The non-standard conditions with Runway 11-29 are identified and discussed in the following sections.

1.2.1 Runway Safety Areas

The FAA requires airports to provide an RSA at each runway end and along the sides to reduce the risk of injury to persons and damage to aircraft in the event of an excursion from the runway. An excursion from the runway includes when an arriving aircraft fails to stop before the end of the runway or an aborted takeoff (overrun), an aircraft arriving on a runway touches down before the start of the paved runway surface (undershoot), or an aircraft veers off to one side of a runway. The FAA requires that airports improve their RSAs to FAA design standards where possible. RSAs are safety improvements and do not extend the length of runways or have any effect on normal runway operations, runway capacity, or the types of aircraft that can use the runways. FAA standards, as defined in AC 150/5300-13A, detail RSA design requirements as follows (see Figure 1-3):

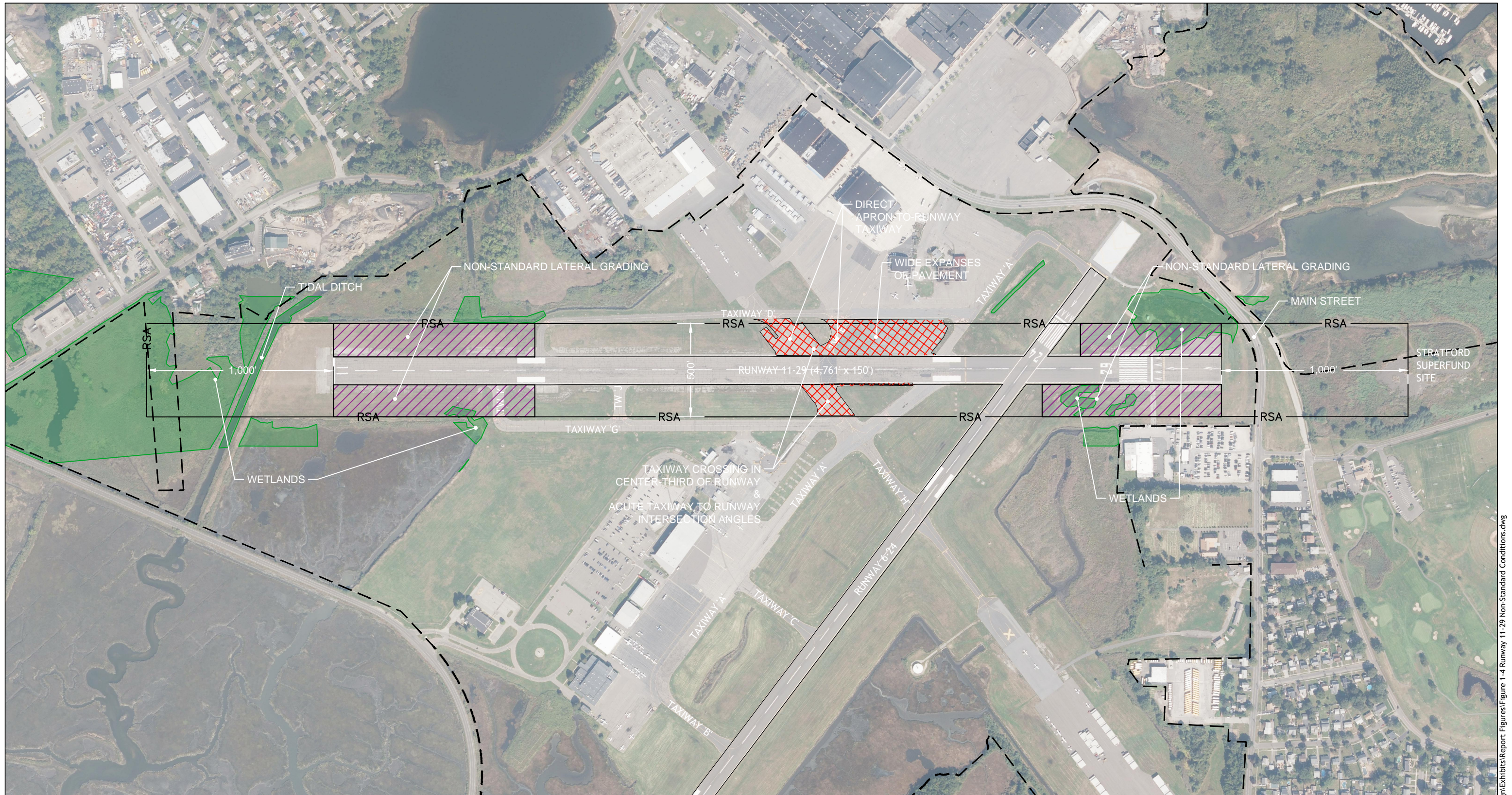
- Cleared and graded with no potentially hazardous ruts, humps, depressions, or other surface variations
- Drained by grading or storm sewers to prevent water accumulation
- Capable under dry conditions of supporting snow removal equipment, aircraft rescue firefighting equipment, and occasional passage of aircraft without causing significant damage to the aircraft
- Free of objects, except for objects that need to be in the RSA because of their function

Figure 1-3: Runway Safety Area



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

The non-standard conditions within the existing RSA for Runway 11-29 are shown in Figure 1-4, and their dimensions are listed in Table 1-3.



Legend

--- Airport Property Line

Igor I. Sikorsky Memorial Airport




0 250 500 1000 Feet

Sources: Imagery (esri/State of CT., 2019)


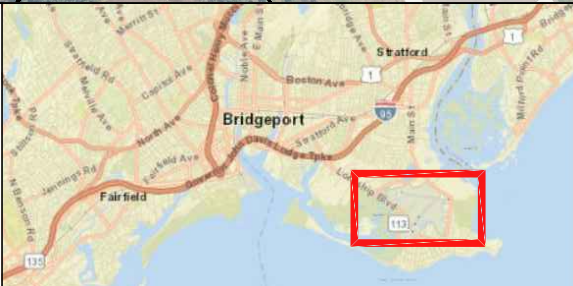



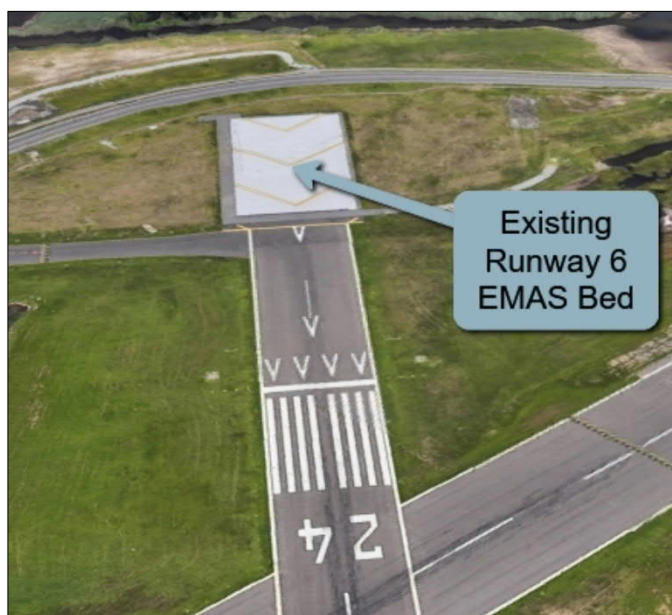
Figure 1-4
Runway 11-29 Non-Standard Conditions

Table 1-3: RDC C-III Runway Safety Area Design Standards

	RSA Width		RSA Length Beyond Runway End	
	Existing (ft)	Required (ft)	Existing (ft)	Required (ft)
Runway 11	240	500	360 approach	600 approach
			240 departure	1,000 departure
Runway 29	0	500	540 approach	600 approach
			110 departure	1,000 departure

Source: BDR Airport Master Plan, CHA 2021.

Engineered Materials Arresting Systems (EMAS) are often used when a full-dimension RSA is not practicable due to a lack of available land or environmental resources located at the end of a runway. An EMAS bed provides a level of safety equivalent to a full-dimension RSA. A standard bed is made of material designed to stop an aircraft traveling with a runway exit speed of 70 knots. EMAS is an energy-absorbing material placed at the end of a runway and designed to accommodate a runway's critical aircraft. The material crushes under the weight and surrounds the landing gear, stopping the aircraft. The runway's critical aircraft determines the length of the EMAS bed. FAA provides guidance in comparing RSA alternatives and EMAS to determine financial feasibility, which is discussed in the Alternatives chapter.



1.2.2 Obstructions

The obstruction survey completed as part of the Master Plan identified multiple tree penetrations to FAA design surfaces on both ends of Runway 11-29. As a coastal airport, large areas of tree obstructions are not present, but some removals are needed to ensure continued airspace protection for runway operations. The identified obstructions are located both on and off airport.

1.2.3 Other Deficiencies

The Master Plan identified other issues with Runway 11-29 unrelated to its RSAs that will also be addressed as part of this EA. They are discussed below.

Excess Pavement

According to the Master Plan, the midpoint of Runway 11-29 and the intersection of Taxiways E and H create several non-standard conditions that can be rectified with pavement removal and reconfiguration. The current non-standard conditions in the location include (refer to Figure 1-4):

- Taxiway crossings in the center third of the runway – Taxiways E and H
- Taxiways leading directly from an apron to the runway – Taxiways E and H
- Taxiways intersecting the runway and acute angles – Taxiways E and H

- Wide expanses of pavement – between Taxiway D and Runway 11-29

Wildlife Attractant Issues

The proximity of wetland areas dominated by tall vegetation to the existing pavement of Runway 11-29 has increased the potential for wildlife strikes on the airfield. A review of the FAA Wildlife Strike Database indicates an increase in recorded wildlife strikes over the past six years, representing 20 percent of all wildlife strikes reported at BDR since 1990. Two white-tailed deer have been struck by aircraft at the airport within the past three years, which is a significant concern. The tall vegetation growing within the wetland areas and the minimal vegetation management have created a situation where hazardous wildlife, including white-tailed deer and flocking bird species, has visual cover near the active runway.

1.3 SPONSOR'S PROPOSED ACTION

The Sponsor's Proposed Action includes enhancing the non-standard conditions for Runway 11-29 as shown on the FAA-approved ALP (see Figure 1-5). The following project components are part of the Sponsor's Proposed Action:

- Shift Runway 11-29 150 feet to the west, allowing for additional RSA for arrivals
- Install EMAS on both ends to satisfy RSA standards beyond runway ends
- Grade lateral RSA to satisfy standards along the sides of Runway 11-29
- Reconstruct 2,100 feet of Runway 11-29
- Remove on and off obstructions (trees) within both approaches to Runway 11-29
- Excess pavement removal

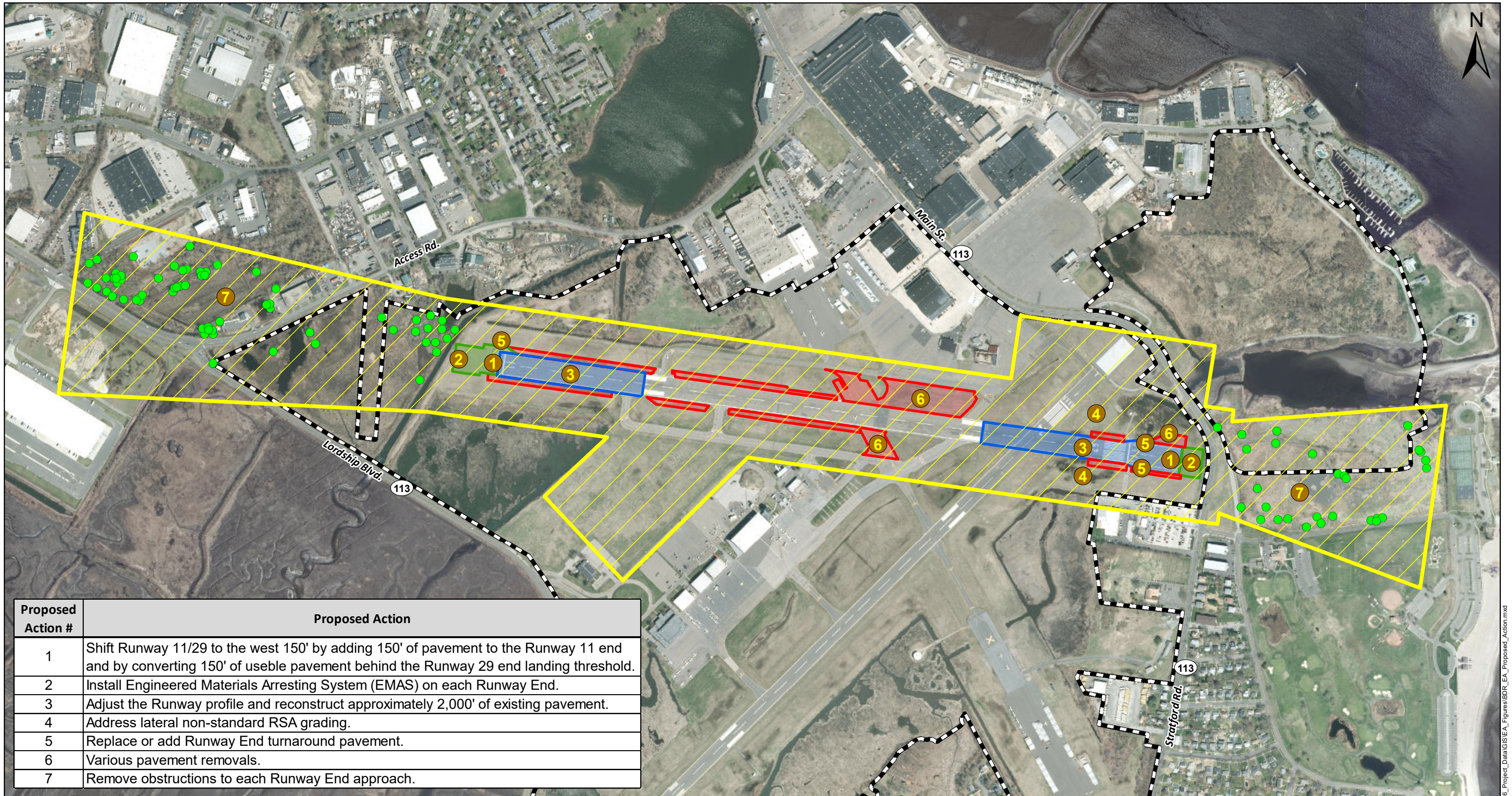
1.4 FEDERAL ACTIONS

There are numerous actions necessary for federal approval to allow the Sponsor's Proposed Action to occur. These include the approval of the ALP elements associated with the Runway 11-29 improvements. In addition, environmental approval is required to support Airport Improvement Program (AIP) grant-in-aid funding for the Sponsor's Proposed Action. The following federal actions will be required as part of the project:

- Unconditional approval of the updated ALP for BDR, depicting the proposed improvements pursuant to 49 USC § 40103(b), 44718, and 47107(a)(16)
- Federal environmental approval of further processing of an application for federal assistance to implement those AIP eligible projects

1.5 TIMEFRAME OF THE PROPOSED ACTION

The City of Bridgeport expects to submit the Final EA to the FAA in May 2022 and anticipates an environmental finding before June 2022. The city will apply for FAA AIP Fiscal Year (FY) 2023 funding for the first phase of the program, which will be design and permitting. The construction may be phased over multiple years depending on funding; however, work is anticipated to begin as early as 2024 and could be completed by 2025 or 2026, depending on AIP funding and how the project is phased.

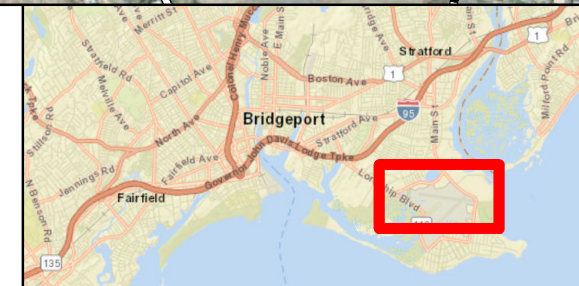


Proposed Action #	Proposed Action
1	Shift Runway 11/29 to the west 150' by adding 150' of pavement to the Runway 11 end and by converting 150' of useable pavement behind the Runway 29 end landing threshold.
2	Install Engineered Materials Arresting System (EMAS) on each Runway End.
3	Adjust the Runway profile and reconstruct approximately 2,000' of existing pavement.
4	Address lateral non-standard RSA grading.
5	Replace or add Runway End turnaround pavement.
6	Various pavement removals.
7	Remove obstructions to each Runway End approach.

Legend

- Airport Property Boundary
- Study Area
- Tree Obstruction
- Proposed Action
- Existing Pavement Reconstruction
- Existing Pavement Removal
- New Pavement

**Sponsor's Proposed Action
Igor I. Sikorsky Memorial Airport**



Sources: Imagery (esri/State of CT., 2019)

**Figure 1-5
Sponsor's Proposed Action**

2 PURPOSE & NEED

The Sponsor's Proposed Action includes improvements to the RSA for Runway 11-29 and the removal of both on and off airport obstructions to various FAA design surfaces for the runway. The City of Bridgeport and the FAA have initiated this EA under NEPA to assess and consider potential impacts on the human and natural environments from the Sponsor's Proposed Action. The purpose and need for the Sponsor's Proposed Action must be clearly explained and stated in terms that are understandable to individuals unfamiliar with aviation or commercial aerospace activities. It presents the problem being addressed and describes what the Airport Sponsor is trying to achieve with the Sponsor's Proposed Action. It provides the parameters for defining a reasonable range of alternatives to be considered. Presented in this chapter is a concise statement of purpose for the Proposed Project, as introduced in Section 1.3, and a series of substantiating points as to why the Proposed Project is needed and will be of benefit to BDR and its users

2.1 PURPOSE

The purpose of the project is to provide runway and associated airfield improvements that comply with FAA design standards to the extent practicable while meeting the runway length operational requirements for both the existing and future fleet mix. According to the BDR Master Plan (2020), the existing runways at BDR do not provide the length required for the entire fleet mix operating today. The Master Plan evaluation identified that reducing the capability of Runway 11-29 would significantly impact existing jet aircraft users that rely on both runways for takeoffs and landings. This fact was verified in early 2020 when the airport restricted operations on Runway 11-29 to aircraft with a maximum takeoff weight of 12,500 pounds due to poor pavement conditions and recent flooding. Several existing jet operators were grounded during western and northwesterly winds or diverted/relocated to other airports when wind conditions required their use of Runway 11-29. The Master Plan wind analysis and facility requirement determination identified that BDR should ideally have a jet runway with ARC C-III, with a length of 5,700 feet, plus a crosswind ARC B-II runway for smaller aircraft under 12,500 pounds maximum takeoff weight. The longer length of the primary runway would permit most operations, even during crosswind and wet runway conditions. However, given the sensitive resources on and in the immediate vicinity of BDR, a runway extension is not feasible, and thus jet operations will remain distributed to both runways per wind conditions. The short runway lengths at BDR prevent many jet aircraft from accepting crosswind takeoffs and landings, resulting in the need for both runways at their current lengths to support these operations. Therefore, while the existing RSA deficiencies should be addressed, the existing Runway 11-29 cannot be shortened to do so.

2.2 NEED

The need for the project is to address non-standard FAA design criteria and increase safety for aircraft and their passengers by improving the RSA for Runway 11-29 along the sides and beyond the ends of the runway. The need to correct other runway deficiencies include removing obstructions, eliminating non-standard pavement, and addressing wildlife attractants within the RSA.

2.2.1 Need to Eliminate Non-Standard Safety Areas

The RSA is an important part of an airport's runway environment. The FAA defines the RSA as "*a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the*

event of an undershoot, overshoot, or excursion from the runway.” The FAA design standards for the RSA also include the following criteria:

- The RSA should be cleared and graded with no hazardous ruts, bumps, depressions, or other longitudinal/transverse grade changes.
- The RSA must be capable, under dry conditions, of supporting Aircraft Rescue Fire Fighting vehicles, snow removal equipment, and an aircraft without causing structural damage.
- The RSA should be properly drained within FAA design standards for drainage.
- The RSA should be free of objects, except for those that are “fixed by function.” Any object higher than 3 inches above grade should be constructed with frangible mounted structures.

The standard RSA dimensions for Runway 11-29 should be 500 feet wide, centered on the runway centerline, and extend 1,000 feet beyond each end of the runway. At least 600 feet of RSA should be provided for arriving aircraft. However, the RSA lengths beyond both ends of the existing Runway 11-29 do not meet FAA design criteria. Currently, at the Runway 11 end, a standard RSA would include a channelized, tidal drainage ditch, wetlands, and a private property located along the Access Road. At the end of Runway 29, portions of Main Street, Dorne Drive, and Town of Stratford property are located within the RSA. The lateral RSA for Runway 11-29 is also non-standard based on excessive grades adjacent to the runway pavement and open water tidal wetlands on the airfield.

2.2.2 Need to Eliminate Obstructions

The airport has multiple obstructions to Federal Aviation Regulation (FAR) Part 77 surfaces and Obstacle Clearance Surfaces that are required to be clear to meet FAA design standards. Runways comprise several associated elements, including imaginary surfaces to ensure aircraft safety. The FAA has established design standards based on operational and safety considerations for these imaginary surfaces. No objects should penetrate these surfaces, whether on or off airport property, to provide pilots and passengers with the clearest and safest approach. FAA policy requires that full compliance with FAR Part 77 requirements be achieved for property owned/controlled by the airport and that the standards be met to the extent possible on property not owned/controlled by the airport. An obstruction survey, completed as part of the Master Plan and ALP update, revealed existing and future penetrations to various surfaces.

2.2.3 Need to Address Flooding

Most of BDR is within the Federal Emergency Management Agency (FEMA) designated 100-year floodplain. The portions of BDR that are not within the 100-year floodplain are within the 500-year floodplain. Therefore, any proposed projects at BDR are within a FEMA designated floodplain, and compliance with applicable state and federal flood and stormwater management standards must be demonstrated, including adherence to Section 25-68d of the Connecticut General Statutes. The existing threshold elevation for Runway 29 is only 6 feet above sea level and is routinely inundated with water during storm events. A short-term solution recommended in the recently completed Master Plan is to raise the Runway 29 end and modify the longitudinal grades within design standards to mitigate the flooding potential of airport facilities.

2.2.4 Need to Eliminate Hazardous Wildlife Attractants

AC 150/5200-33: *Hazardous Wildlife Attractants on or near Airports* provides guidance on land use that has the potential to attract hazardous wildlife to airports. This guidance applies to all airports that receive

funding under the AIP. The AC recommends a separation distance of 10,000 feet between the Airport Operations Area and the hazardous wildlife attractant at airports serving turbine-powered aircraft if the attractant could cause hazardous wildlife movement into or across the approach and departure airspace. Wetlands are listed as one land use that potentially attracts wildlife. As stated in Section 1, the airport is surrounded by tidal wetlands and marshlands; however, there are also wetlands within the RSA, off the end of both runways, and along the sides of Runway 11-29 that abut the existing pavement.

2.2.5 Need to Maintain Existing Runway Length

According to the 2020 Master Plan, BDR requires a runway length of at least 5,700 feet. Although the Master Plan does not recommend an extension to Runway 11-29 due to an accepted agreement with the Town of Stratford prohibiting runway extensions, the Master Plan documents both runways as inadequate to support the entire fleet mix. Therefore, the need to maintain the existing length of Runway 11-29 is considered critical.

3 ALTERNATIVES

The previous section described the need to comply with FAA design standards and improve safety for aircraft operating on Runway 11-29. This section describes and analyzes alternatives considered to meet the identified purpose and need. The alternatives developed for this assessment are based on the requirements contained in the FAA Order 5050.4B and 1050.1F. Impacts on the airport and its surroundings will be assessed based on the implementation of one of these alternatives.

The improvements to Runway 11-29 will be discussed in terms of Build Alternatives and a No-Build Alternative. The Sponsor's Preferred Alternative is identified as depicted on the ALP approved by the FAA in February 2021. The No-Build Alternative is assessed under the guidance of Section 1502.14 (d) of the Council on Environmental Quality (CEQ) regulations, which requires that a "no-build alternative" be considered in development projects.

3.1 ALTERNATIVES SCREENING

The FAA provides guidance for developing alternatives during an RSA improvement project, which are contained in FAA Order 5200.8: *Runway Safety Area Program* and FAA Order 5200.9: *Financial Feasibility and Equivalency of Runway Safety Area Improvement and Engineered Materials Arresting System (EMAS)*. The first alternative in any non-standard RSA case is to construct a traditional graded area surrounding the runway to satisfy standards; however, this might not be practicable in many cases given an airport's surroundings. Where it is not practicable to achieve a "traditional" RSA (500 feet wide and 1,000 feet beyond the runway ends for Runway 11-29), as much RSA as possible should be obtained. FAA Order 5200.8 specifically lists different alternatives that should be analyzed as part of the RSA process. The applicability of these alternatives can vary greatly depending on location and the airport's surrounding environment. The following criteria were used to identify feasible and reasonable alternatives for enhancing the RSA for Runway 11-29 to the extent practicable:

- Preserve runway length: The alternative should maintain the utility and efficiency of Runway 11-29 by continuing to accommodate RDC C-III aircraft, as discussed in previous sections and as shown on the FAA-approved ALP.
- Provide standard RSA consistent with FAA design criteria: The alternative should provide protection for aircraft that land short of the runway threshold (undershoot), fail to stop before the runway end on landing or departure (overrun), or leave the runway environment during takeoff or landing at any point on the runway. The level of safety required by FAA design criteria for a full RSA is 500 wide laterally (250 feet from runway centerline on both sides of the runway), 1,000 feet long for an overrun, and 600 feet long of an underrun.
- Practicality and Feasibility: The alternative should avoid any impacts on relocating Route 113.
- Avoid and minimize environmental impacts where practicable: The alternative should avoid and minimize environmental impacts by selecting options that meet as many FAA design standards as possible while minimizing impacts off airport property.

Utilizing FAA Order 5200.8 and the screening criteria, the following five alternatives, along with a No-Build, were evaluated:

- Alternative 1: Construct Standard RSA for Runway 11-29
- Alternative 2: Relocate or Realign Runway 11-29
- Alternative 3: Reduce Length of Runway 11-29
- Alternative 4: Declared Distances
- Alternative 5: Shift Runway & Install EMAS
- Alternative 6: No-Build

3.2 PRELIMINARY ALTERNATIVES

3.2.1 Alternative 1: Construct Standard RSA for Runway 11-29

This scenario would construct a fully compliant RSA beyond both runway ends without relocating and/or displacing the runway thresholds (see Figure 3-1). With standard RSAs off both ends, the runway length would remain at 4,761 feet for operations in both directions; however, this alternative would have the greatest impact on environmental resources. To construct a full RSA beyond both ends, approximately 5.6 acres of wetlands would be filled, approximately 800 feet of Main Street would have to be relocated around or tunneled underneath the extended RSA and Runway Object Free Area (ROFA)¹, property acquisition would be required, and grading (cut) would be required in an existing landfill. The environmental impacts and impacts on off-airport property and transportation systems make a standard RSA not practicable.

3.2.2 Alternative 2: Relocate or Realign Runway 11-29

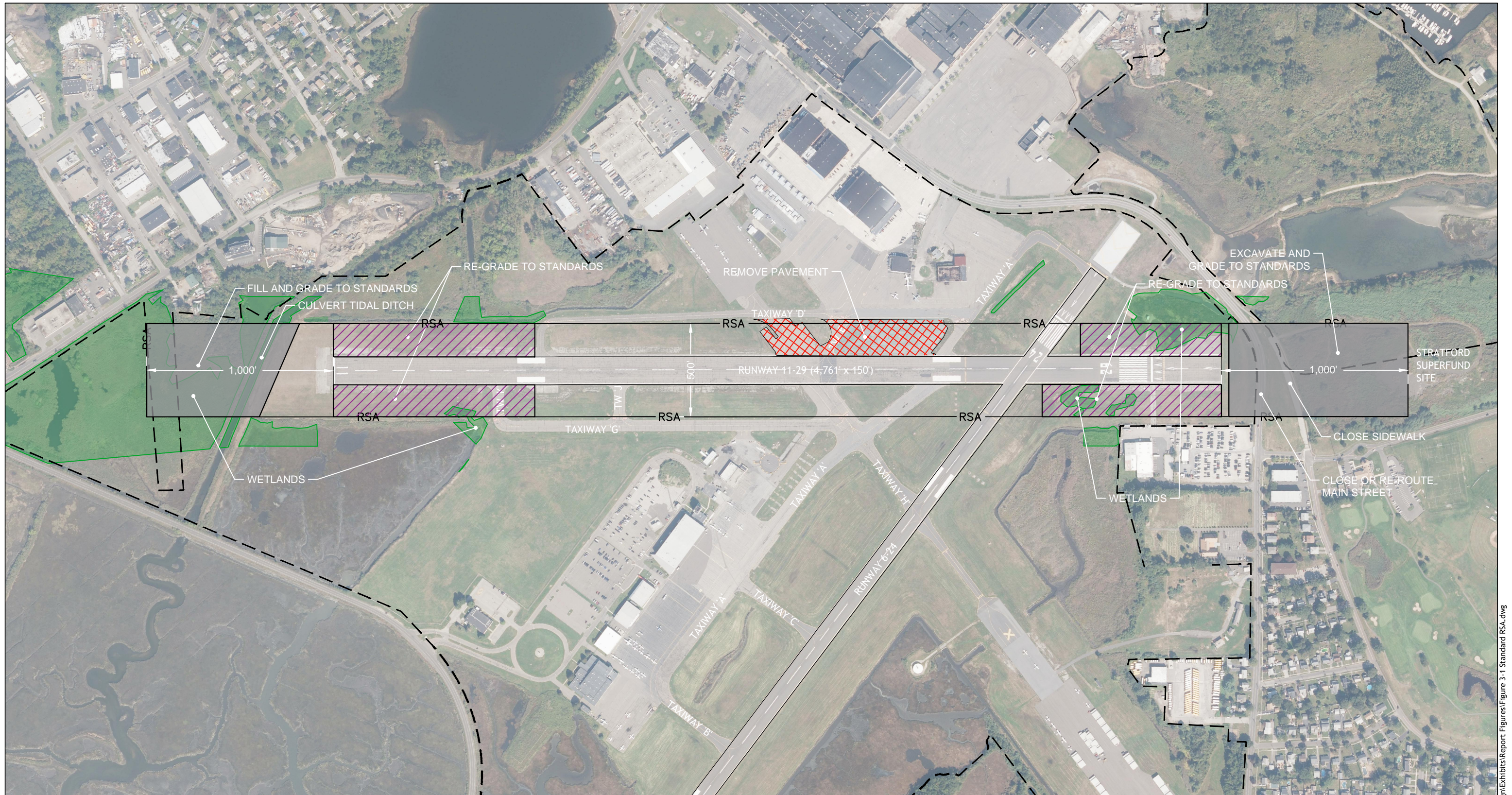
According to FAA Order 5200.8, relocating or realigning Runway 11-29 should be evaluated as an alternative to the standard graded area beyond the runway end. The airfield is currently confined by the surrounding residential area to the south (Lordship neighborhood) and commercial and industrial development and sensitive environmental areas to the north, east, and west. Given the confined airport property boundary, the runway cannot be realigned without severely impacting wetlands and other sensitive environmental resources as well as off-airport transportation systems, businesses, and residential areas. Therefore, relocating or realigning the runway to obtain standard RSA beyond the runway ends without EMAS does not support the purpose and need.

3.2.3 Alternative 3: Reduce Length of Runway 11-29

This alternative would reduce the runway length so that standard RSA beyond the runway ends would be contained to airport property. Any reduction in the existing length of 4,761 feet was considered infeasible based on operational requirements of the aircraft fleet mix operating at BDR. To obtain standard RSA beyond the runway ends for takeoff, the runway length would be reduced to 3,761 feet. Runway length requirements are based on various conditions, including airport elevation, mean daily maximum air temperature, runway gradient, and the gross takeoff and landing weights of the critical aircraft expected to regularly use the runway (i.e., at least 500 annual itinerant operations).

AC 150/5325-4B: *Runway Length Requirements for Airport Design* outlines the process for determining recommended runway length at an airport. In summary, this process involves identifying the critical aircraft, or family of aircraft, and its maximum certified takeoff weight; calculating the recommended

¹ An area centered on the ground on a runway centerline provided to enhance the safety of aircraft operations by remaining clear of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.



Legend

— — — Airport Property Line

Igor I. Sikorsky Memorial Airport




0 250 500 1000 Feet

Sources: Imagery (esri/State of CT., 2019)


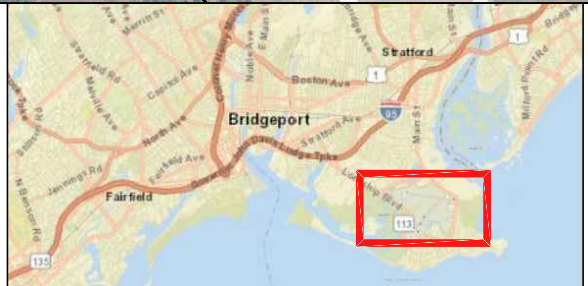



Figure 3-1
Alternative 1: Standard RSA

runway length for the critical aircraft based on the appropriate “runway length curves”; and, if appropriate, adjusting the recommended runway length for aircraft and runway characteristics (e.g., runway gradient, wet runway conditions).

BDR is experiencing regular operations from the Bombardier Global Express and Gulfstream 550 aircraft. The Bombardier Global Express series aircraft has a maximum certified takeoff weight between 92,500 pounds and 99,500 pounds, requiring 6,170 feet of runway for takeoff at full capacity, with 5,540 feet listed for typical conditions. Additionally, AC 150/5325-4B provides charts to determine runway length requirements for medium-sized aircraft (i.e., aircraft weighing from 12,500 pounds up to and including 60,000 pounds). For BDR, a condition of 75% of Fleet at 90% useful load was considered. According to the 2020 Master Plan, BDR’s runways would require a runway length of 5,700 feet. The Master Plan does not include recommendations to extend either runway due to an accepted agreement with the Town of Stratford prohibiting runway extensions. However, because the current and future critical aircraft require runway lengths longer than provided at BDR (at maximum capacity), it is inadvisable to pursue any runway projects that would reduce available distances. Reducing the runway length could hinder or prevent activity by existing based and itinerant aircraft, particularly during periods when wind conditions favor use of Runway 11-29. Similarly, shortening the runway may thwart future tenants with jet aircraft from considering BDR, and thus hamper potential airport revenues. BDR currently runs an annual deficit of roughly \$500,000.00.

3.2.4 Alternative 4: Declared Distances

According to FAA, the use of declared distances for airport design should be limited to runways that have constrained surroundings where it is impractical to provide the required RSA, ROFA, or Runway Protection Zone² (RPZ). The FAA defines declared distances as the distance an airport operator declares to satisfy an aircraft’s takeoff run, takeoff distance, accelerate stop-distance, and landing distance. When declared distances are used, the airport provides specific distance information for calculating maximum operating weights. These four “distances” are described in the following subsections and shown in Figure 3-2.

Takeoff Run Available (TORA)

The takeoff run available (TORA) is the distance to accelerate from brake release to lift-off. Typically, the TORA is measured from the start of takeoff to the end of the runway. However, if a departure RPZ is located due to incompatible land use, the TORA ends 200 feet before the departure RPZ and will be shorter than the actual runway length. Regarding RSA compliance, the TORA is not required to have a fully compliant RSA at either end of the runway.

Takeoff Distance Available (TODA)

The takeoff distance available (TODA) is defined as the length of the TORA plus the length of a clearway, if provided. A clearway, if available, is defined as an area beginning at the end of a runway that must be under the Sponsor’s control, be at least 500 feet wide, not exceed 1,000 feet in length, and be clear of any obstacle or terrain at an upward slope of 1.25 percent (or 80:1). Like the TORA, the TODA does not require a standard RSA beyond the runway end.

² Runway Protection Zones are trapezoidal areas “off the end of the runway end that serves to enhance the protection of people and property on the ground” in the event an aircraft lands or crashes beyond the runway end. Runway Protection Zones underlie a portion of the approach closest to the airport.

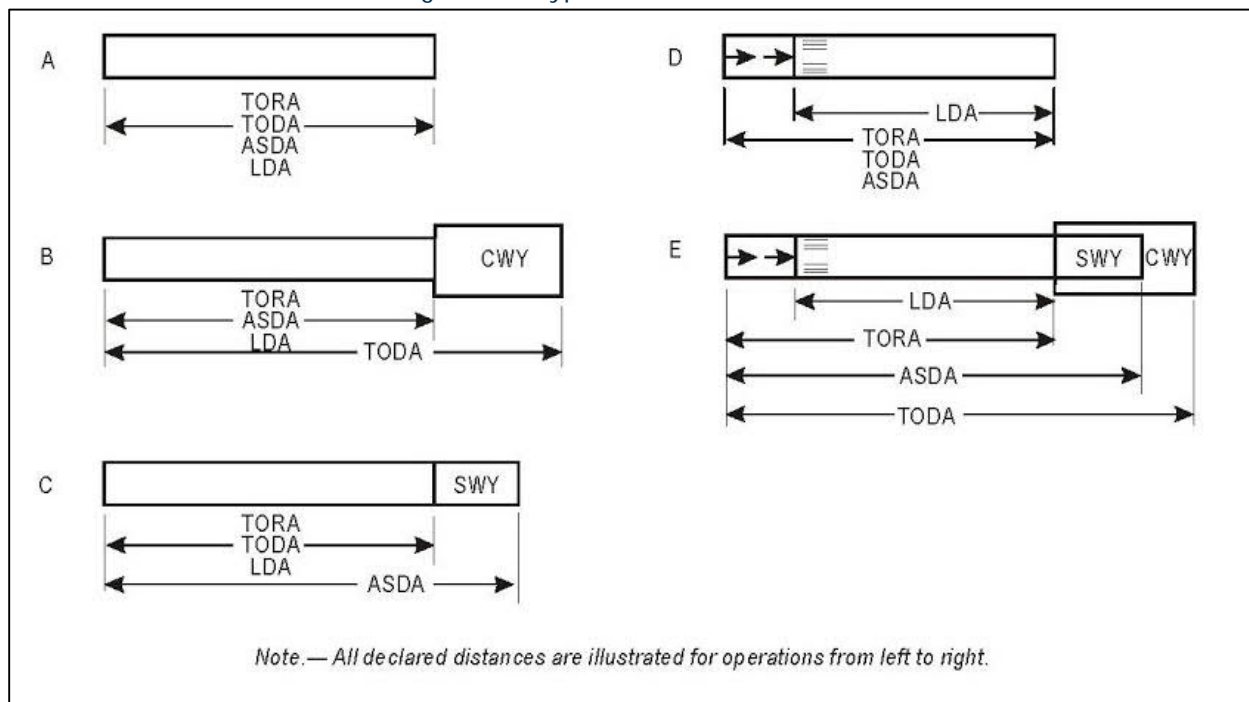
Accelerate-Stop Distance Available (ASDA)

The accelerate-stop distance available (ASDA) is defined as the runway plus stopway length declared available for the acceleration/deceleration of an aircraft aborting its takeoff. The ASDA is measured from the point at which the aircraft takeoff run begins to the point where the standard RSA or OFA begins, whichever is shorter. For RDC C-III, if a standard 1,000-foot RSA and ROFA cannot be provided beyond the runway ends of a runway serving approach, the ASDA is shorter than the length of the runway.

Landing Distance Available (LDA)

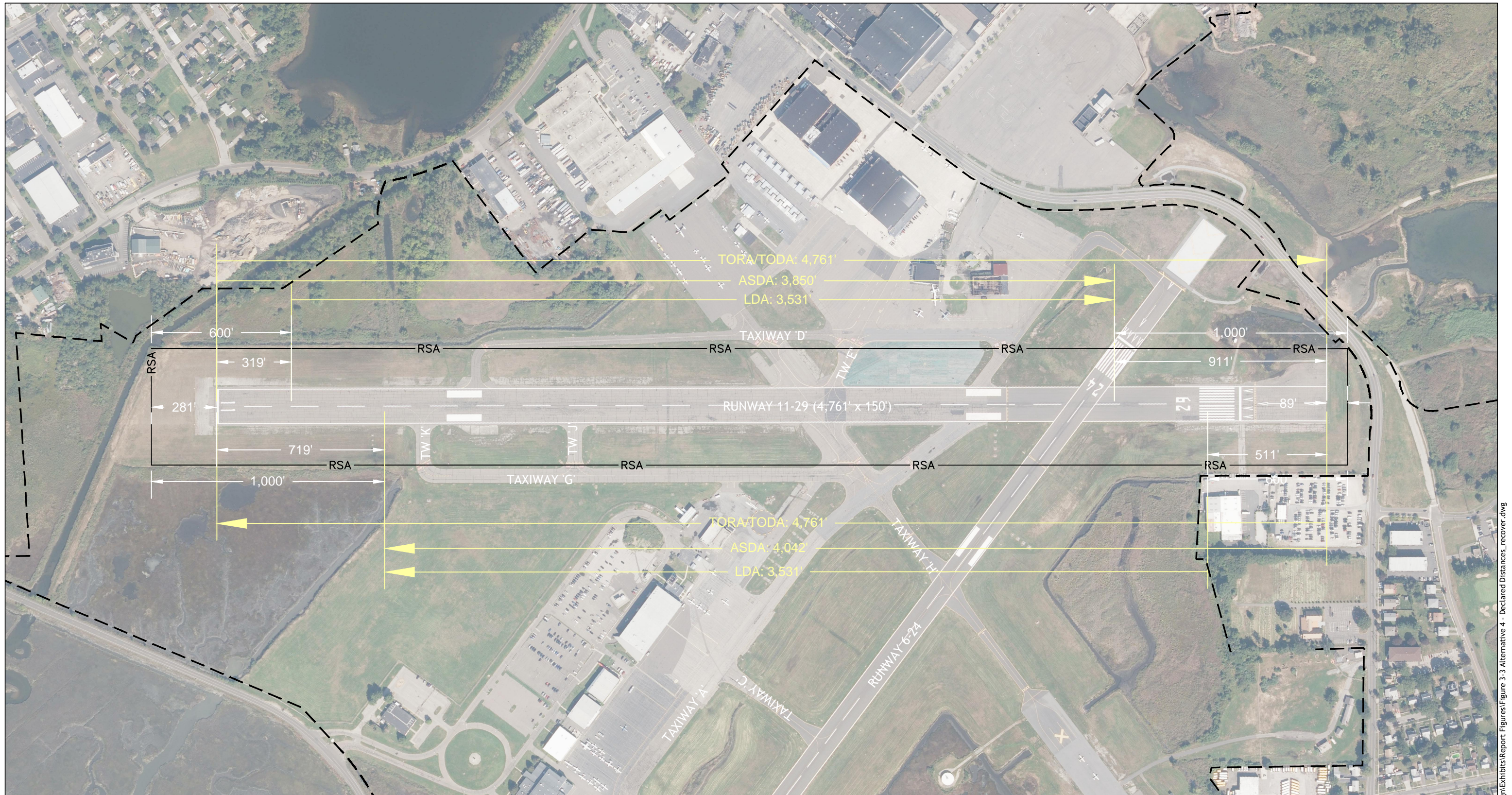
The landing distance available (LDA) is defined as the runway length declared available for the ground run of an aircraft landing. The LDA cannot be longer than the runway, but with obstacles on the ground or in the approach of a given runway, the LDA can be shorter to provide standard RSA(s) and/or clear approach surfaces. The LDA is measured to the point where the standard RSA or ROFA begins at the rollout end of the runway or the runway end, whichever yields a shorter distance.

Figure 3-2: Typical Declared Distances



Source: FAA, 2017.



Alternative 4 would apply declared distances to the current 4,761-foot runway (see Figure 3-3). Currently, Runway 11-29 is 4,761 feet in length, with the Runway 29 threshold displaced 364 feet, providing 4,397 feet for Runway 29 LDA. Utilizing declared distances to obtain standard RSAs off both ends of Runway 11-29, the operating length for ASDA and LDA would be reduced to a point where the runway would not accommodate the existing fleet mix operating at the airport, like Alternative 3. For example, the ASDA for a Runway 11 operation would be reduced to under 4,000 feet. For this reason, declared distances alone were not carried forward.



Legend

— — — Airport Property Line

Igor I. Sikorsky Memorial Airport

0 200 400 800 Feet

Sources: Imagery (esri/State of CT., 2019)


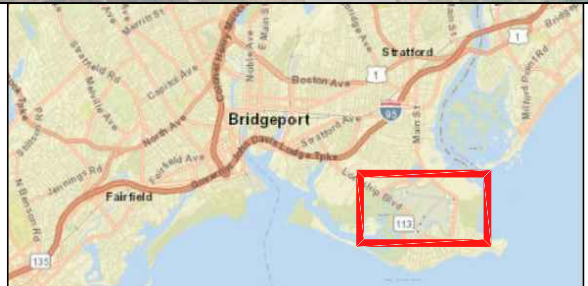



Figure 3-3
Alternative 4 - Declared Distances

3.2.5 Alternative 5: Install Engineered Materials Arresting System (EMAS)

The final RSA concept is the installation of EMAS, which is a bed of lightweight crushable material, at one or both ends of a runway. Currently, there are two EMAS technologies approved by the FAA:

- EMASMAX[®] features four-foot by four-foot cellular cement blocks of adjusted thicknesses that will reliably and predictably crush under the weight of the design aircraft.
- GreenEMAS[®] is a foamed silica bed made from recycled glass and contained within a high-strength plastic mesh system anchored to the pavement at the end of the runway. The foamed silica is poured into lanes bounded by the mesh, covered with a poured cement layer, and treated with a topcoat of sealant.

Currently, EMASMAX[®] is eligible for AIP funding; however, GreenEMAS[®] is not. According to the FAA, a standard EMAS will provide a level of safety equivalent to a full RSA with standard length and width; therefore, this concept is utilized in situations where a runway's surroundings constrain it from undertaking any of the previously discussed concepts³. The EMAS is designed per maximum certified takeoff weight of the critical aircraft and the available RSA beyond each runway end. The EMAS should be designed to stop critical aircraft exiting the runway at 70 knots. A non-standard EMAS installation would stop design aircraft exiting the runway between 40 and 70 knots. Installing EMAS on both ends of Runway 11-29 would improve the existing RSA and maintain the existing runway length; therefore, this scenario will be carried forward.

3.3 FINANCIAL FEASIBILITY OF RSA IMPROVEMENT

In March 2004, the FAA published FAA Order 5200.9: *Financial Feasibility and Equivalency of Runway Safety Area Improvement and Engineered Materials Arresting System (EMAS)*. This order provides guidance for comparing various RSA improvement alternatives with improvements that use EMAS. This order also helps airport sponsors and the FAA determine the maximum feasible cost for RSA improvements, whether they include EMAS or not. The order also assists airport sponsors with developing proposed actions for the NEPA review process.

The order utilizes a standard EMAS installation as the threshold for comparing RSA alternatives and determining the most feasible alternative. The guidance contained in FAA Order 5200.9 should be used with FAA Order 5200.8: *Runway Safety Area Program*. Previous RSA determinations should be reevaluated using the guidance contained in 5200.9 to decide whether EMAS is a viable option.

3.3.1 Maximum Feasibility Cost Analysis

When comparing various RSA alternatives, FAA Order 5200.9 provides criteria to analyze and determine the maximum feasible costs. These criteria are:

- What is the EMAS Design Aircraft?
- What length does the EMAS bed need to be to stop the design aircraft safely?
- What is the maximum feasible cost for improving the RSA?

³ AC 150/5220-22B, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*

3.3.2 EMAS Design Aircraft & Preliminary Bed Length

Normally the planning charts contained in FAA Advisory Circular 150/5220-22B: *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns* would be analyzed to determine the potential EMAS bed length requirements. The planning charts in the AC contain a generic list of seven aircraft (DC-9, DC-10, 737-400, 757, 747, CRJ-200, and a G-III) with EMAS bed lengths that are dated given the age of the AC. However, as part of this study, Runway Safe performed a preliminary modeling analysis for BDR (see Appendix A). It should be noted that these lengths could change during the final design of the bed as RSA profiles and transverse grades to accommodate the bed itself are designed and drainage is addressed. RunwaySafe was provided a fleet mix for BDR and the amount of room available beyond the end of both Runway 11 and 29. The fleet mix was used to model the EMAS length and set back distance required to the available room. According to the EMAS preliminary modeling, it was determined that the following bed lengths and setbacks would be required to stop the fleet mix at 70-knot exit speeds:

- Runway 11 Stop End (29 end of runway): 215-foot EMAS bed with a 300-foot setback from the declared end of runway
- Runway 29 Stop End (11 end of runway): 273-foot EMAS bed with a 35-foot setback from the declared end of runway

3.3.3 Maximum Feasible Improvement Cost

FAA's Order 5200.9 includes a chart that depicts a connection between required standard EMAS bed lengths and the maximum feasible cost threshold for bringing a runway's safety areas into conformance. Using the guidance provided within FAA Order 5200.9 and the EMAS bed lengths provided by RunwaySafe, the maximum feasible cost for Runway 11-29 was determined to be approximately \$13 million. This maximum cost represents the overall construction improvement cost. If neither the standard RSA nor the standard EMAS is financially feasible, improving the RSA to standards or to an equivalent level of safety with EMAS is not financially feasible.

3.4 SUMMARY OF PRELIMINARY ALTERNATIVES

An evaluation of the preliminary alternatives was conducted to identify if any of the build alternatives should be eliminated from further consideration and should not be carried further for detailed environmental analysis. This section describes the evaluation criteria, screening process, and the results of the alternatives evaluation. The alternatives remaining after the evaluation will be considered in detail in this EA. The screening process looked at two levels outlined below:

- Level 1 – Satisfying the Purpose and Need (identified in Section 2.2)
- Level 2 – Remaining Project Requirements (identified in Section 3.1)

3.4.1 Level 1 – Purpose & Need

The purpose and need discussed in Chapter 2 identified the need to correct the non-standard RSA for Runway 11-29 while maintaining the existing operating length of 4,761 feet. Table 3-1 shows the results of the Level 1 screening.

Table 3-1: Level 1 Alternative Screening

Level 1 – Purpose & Need			
Alternative	Improve Existing RSA	Maintains Existing Runway Length	Carry Forward to Level 2?
Alternative 1: Construct Standard RSA	Yes	Yes	Yes
Alternative 2: Relocate or Realign Runway	Yes	No	No
Alternative 3: Reduce Runway Length	Yes	No	No
Alternative 4: Declared Distances	Yes	No	No
Alternative 5: Install EMAS	Yes	Yes	Yes

3.4.2 Level 2 – Project Criteria

Although Alternatives 2, 3, and 4 did provide improvements to the existing RSA for Runway 11-29, they did not meet the purpose and need to maintain the existing runway length, so they were eliminated from further consideration. As discussed in Section 3.1, besides maintaining runway length and improving the safety area, project criteria included the feasibility and practicability of the alternative as well as avoiding and/or minimizing impacts off airport property. The two alternatives of the five build alternatives carried forward were Alternative 1: Construct Standard RSA and Alternative 5: Install EMAS. Alternative 1 would require 1,000 feet of RSA beyond each runway end, impacting over 5.6 acres of tidal wetlands, Main Street (Route 113), and the landfill east of the airport. Due to the off airport impacts and the potential impacts on tidal wetlands and the landfill, Alternative 1 was determined not feasible. The impacts from installing EMAS (Alternative 5) were determined to be feasible if the limits of the project remained on airport property. Therefore, Alternative 5 was evaluated further.

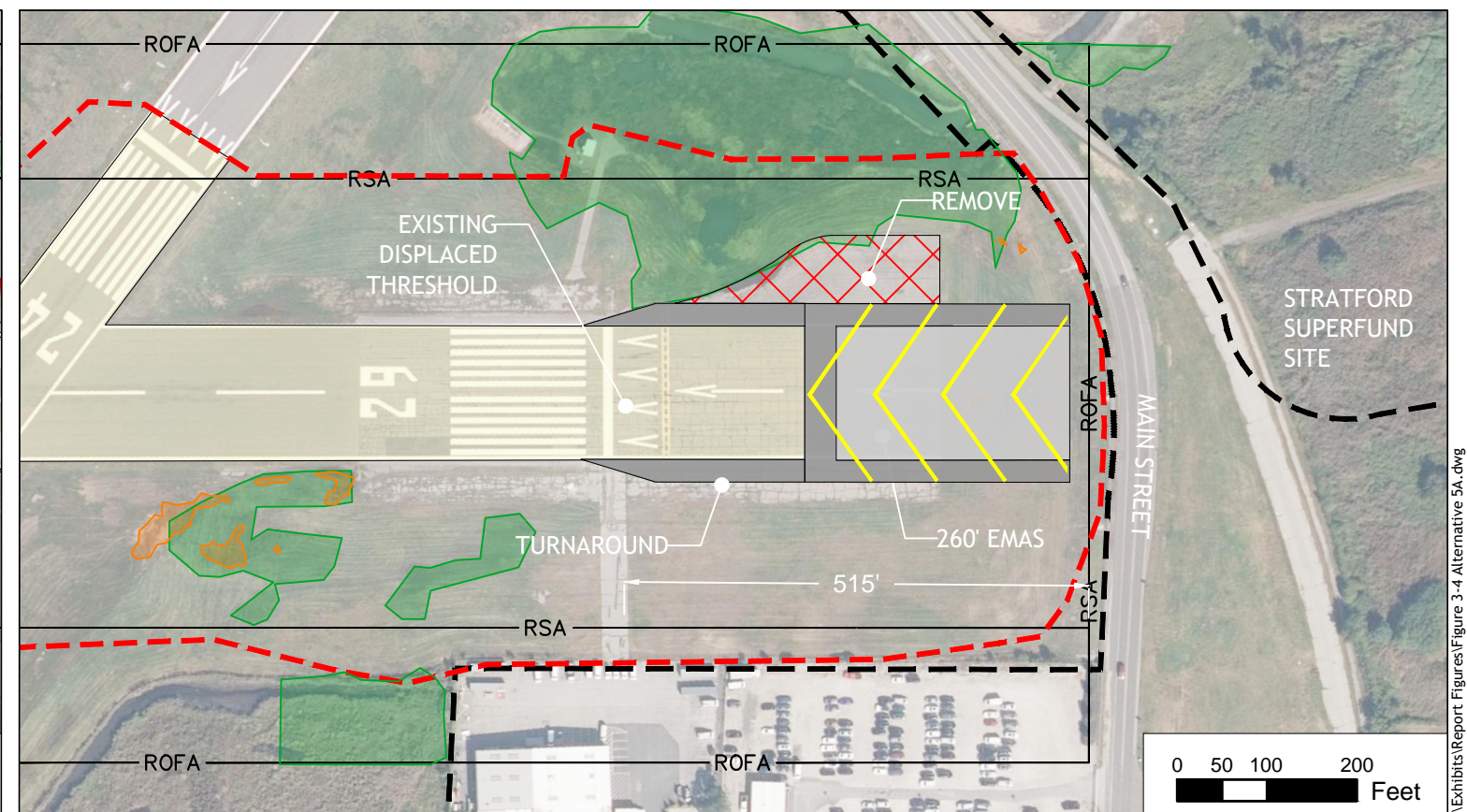
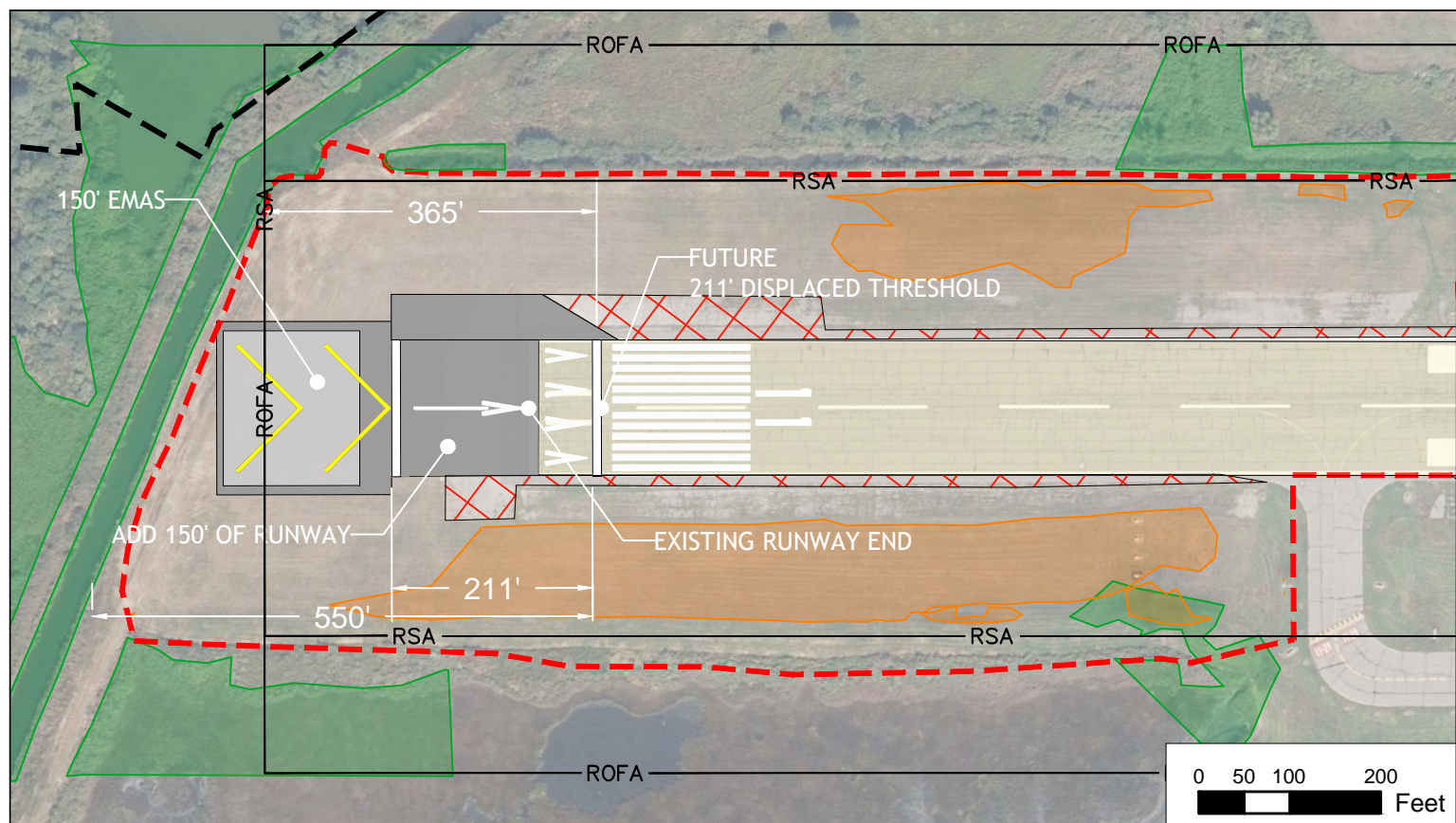
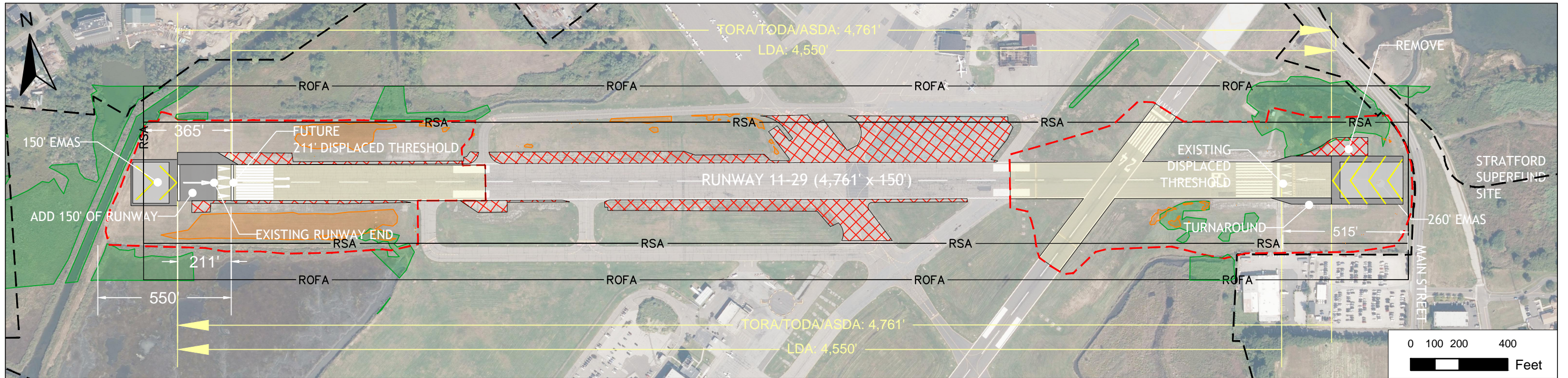
3.5 RUNWAY 11-29 NEPA ALTERNATIVES

The preferred alternative of adding EMAS to both ends of Runway 11-29 (Alternative 5) is further studied as Alternative 5A and Alternative 5B in the following sections.

3.5.1 Alternate 5A: Shift Runway 150 Feet West & Install EMAS On Both Runway Ends

Alternative 5A would shift Runway 11-29 to the west 150 feet, install EMAS on both ends of the runway, and correct the non-standard lateral RSA conditions (non-standard grading, wetlands). The purpose of this alternative is to improve the RSA to the extent practicable while minimizing environmental impacts when compared to Alternative 5B.

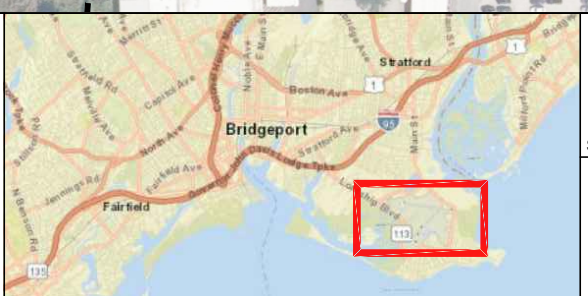
To maintain the existing runway length, Alternative 5A will convert 150 feet of the eastern runway end into RSA, install a 260-foot EMAS bed (with a 35-foot setback), replace the eliminated runway length with 150 feet of new pavement on the western end of the runway, and install a 150-foot EMAS bed with a 35-foot setback from the end of the runway (see Figure 3-4). The eastern end of Runway 11-29 would be raised approximately 4.5 feet to mitigate ongoing flooding issues on that end of the runway. Approximately 2,100 feet of the runway will be reconstructed to adhere to FAA standards for longitudinal and transverse grades within the RSA. Finally, existing surplus pavement that is deteriorated and/or causing non-standard conditions will be removed. In total, approximately 352,560 square feet of impervious area will be removed, and 77,336 square feet of new impervious pavement will be added. This alternative would impact 2.1 acres of tidal wetlands immediately adjacent to the runway pavement causing non-standard conditions and wildlife attractants within the lateral RSA.



Legend

	New Pavement		Wetland (2.01 acres impacted)
	New EMAS Bed		Threatened & Endangered Plant Species (2.82 acres impacted)
	Existing Pavement Removal		Project Limits of Disturbance
	Pavement Reconstruction		Airport Property Line

Igor I. Sikorsky Memorial Airport



See Insert for Scale

Sources: Imagery (esri/State of CT., 2019)

Figure 3-4
Alternative 5A

As discussed in Section 3.3.2, preliminary EMAS bed length modeling indicated that an EMAS bed off the 29 end would need to be 214 feet long and set back 300 feet from the runway end to stop aircraft with a 70-knot exit speed. The EMAS bed off the 11 end should be approximately 308 feet (273-foot bed set back 35 feet from the runway end). To minimize impacts on the tidal channel and tidal wetlands to the west, the EMAS bed length off the 11 end was limited to 150 feet, making it a non-standard installation.

The runway length would remain unchanged, but displaced thresholds would be used to provide additional RSA for landings while providing a minimum LDA of 4,550 feet. The LDA of 4,550 feet is a length that provides advantages during landings in wet conditions and balances the need for RSA to protect against short landings with the need for adequate available landing distance for jet operations. The 150-foot shift provides additional RSA prior to the landing thresholds but not the full required 600 feet.

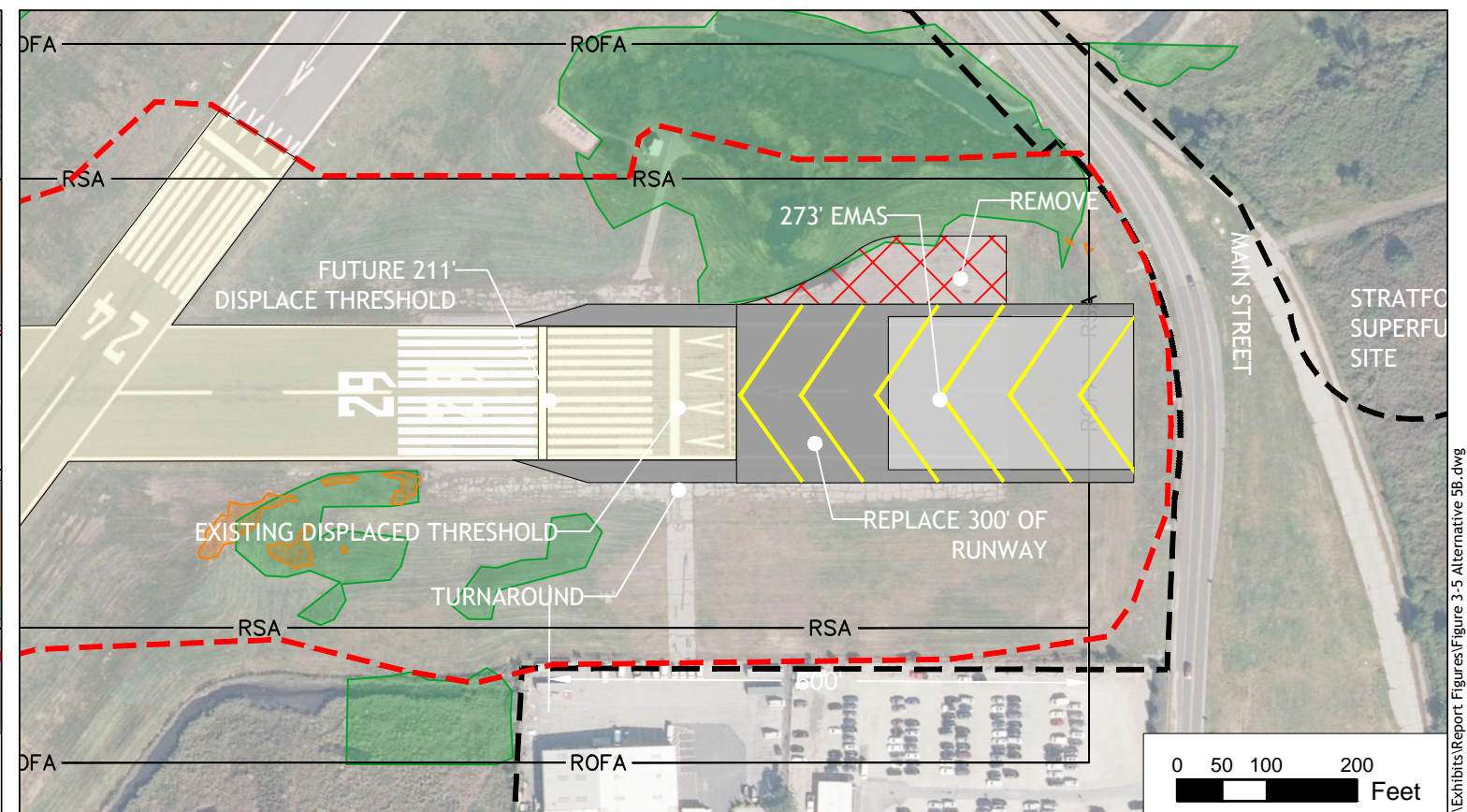
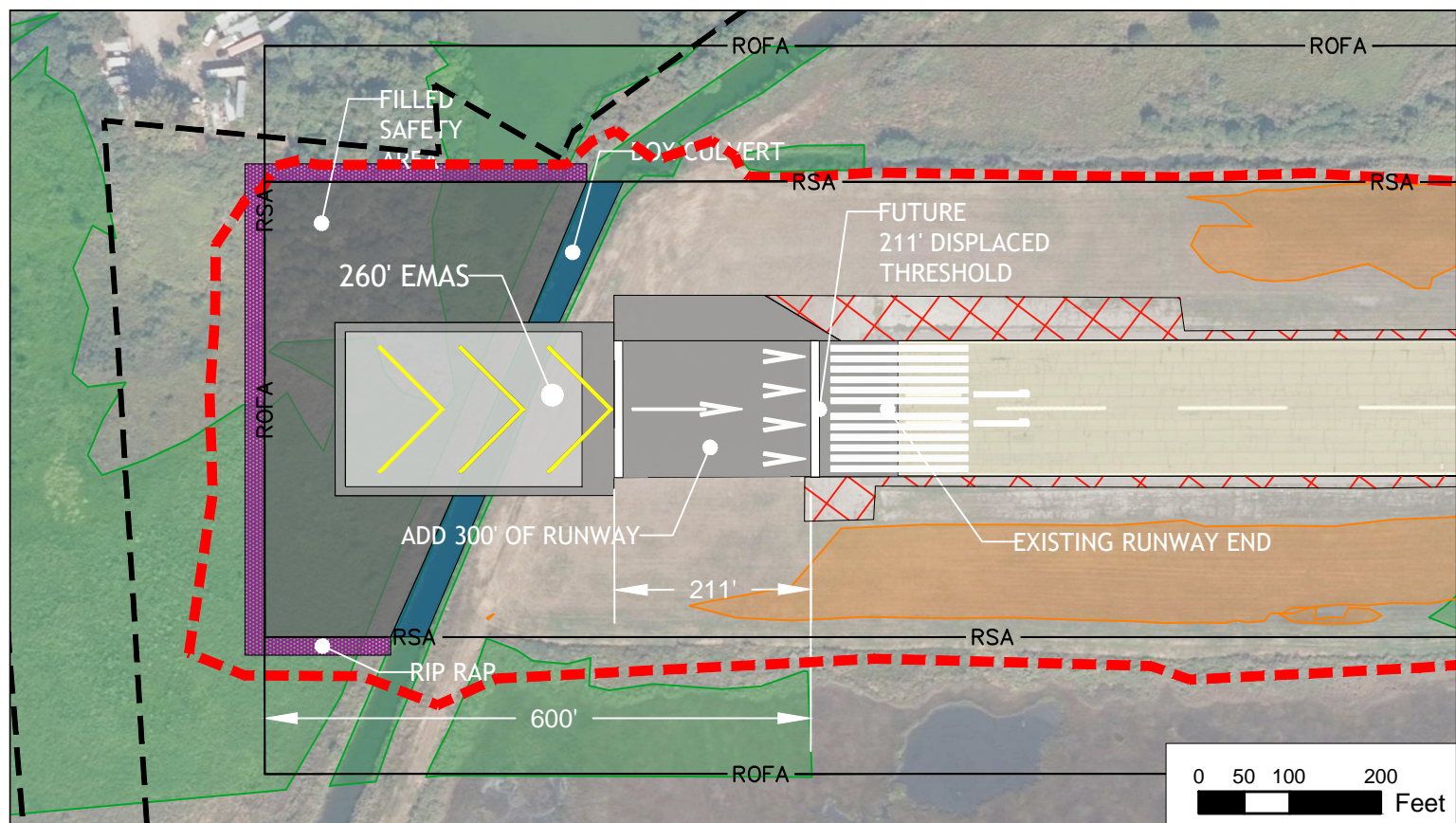
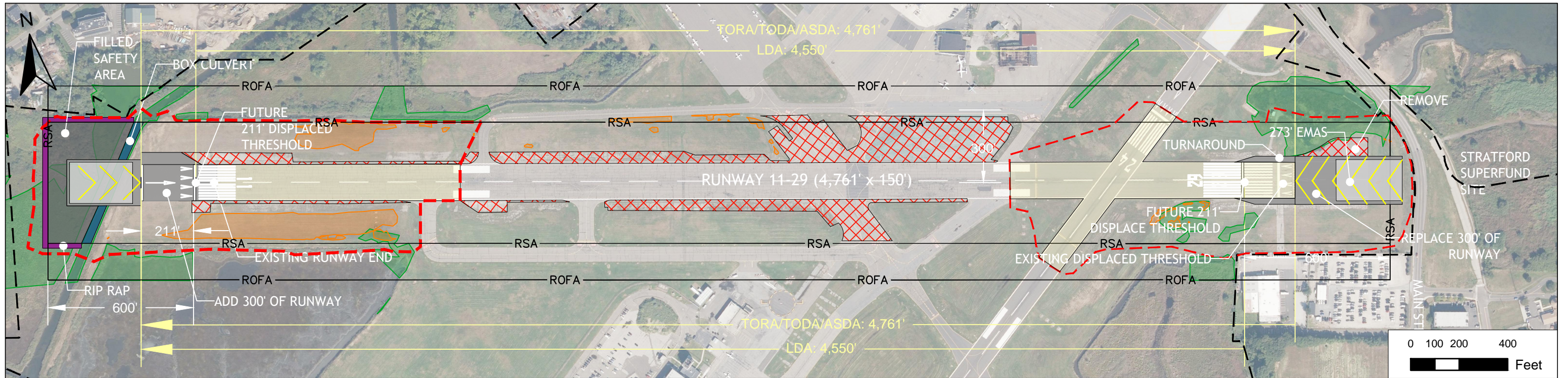
The alternative substantially improves the RSA over existing conditions, provides additional offset from Main Street, and minimizes wetland impacts. However, it does not completely satisfy FAA standards, as the Runway 29 departure end EMAS bed is not long enough for 70-knot aircraft arrests and does not provide the full 600 feet for arrivals on either end. The preliminary cost for Alternative 5A is \$11M. Some advantages and disadvantages of Alternative 5A are below.

Alternative 5A: Shift Runway 150 Feet West & Install EMAS On Both Runway Ends	
Advantages	Disadvantages
✈ Provides an improvement to the existing RSA beyond each end of Runway 11-29	✈ Does not provide 600 feet of RSA for arrivals on either end
✈ Minimizes tidal wetland impacts by half when compared to Alternative 5B	✈ Does not provide adequate area beyond the end of Runway 11 for a standard EMAS bed
✈ No impact on the tidal ditch on the western end	✈ May not provide enough area beyond the Runway 29 end for a standard EMAS bed

3.5.2 Alternative 5B: Shift Runway 300 Feet West & Install EMAS On Both Runway Ends

Alternative 5B would shift Runway 11-29 300 feet to the west by extending the 11 end and shifting the 29 landing threshold. This shift would provide an adequate area to install standard EMAS on both ends of the runway and correct the non-standard lateral RSA conditions previously discussed (non-standard grading, wetlands). Unlike Alternative 5A, this alternative would provide the required 600 feet of RSA in front of the landing threshold for arriving aircraft and provide enough room for standard EMAS beds on both ends.



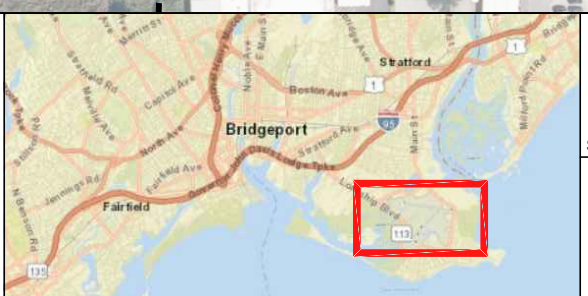
This alternative will convert 300 feet of the eastern runway end into RSA, install a standard EMAS bed to stop the design aircraft at 70 knots, construct 300 feet of additional runway pavement on the western end of the runway, and install a 273-foot EMAS bed (see Figure 3-5). Like Alternative 5A, the eastern end of Runway 11-29 would be raised 4.5 feet to mitigate ongoing flooding issues on that end of the runway to the extent practicable. For the shift to the west, the 11 end of the runway will be raised 1.8 feet, utilizing standard longitudinal pavement grades and standard transverse grades extending out to the limits of the RSA. The need to raise both runway ends would require reconstructing approximately 2,100 feet of the runway. There would also be 1,030 feet of rip rap surrounding the newly constructed RSA, and a 630-foot concrete box culvert would be required to enable the existing tidal ditch to flow under the RSA. Since no parallel taxiways meet either landing threshold for Runway 11-29, turnarounds will be constructed on both ends as aircraft currently have to back taxi down the runway and turn when departing.



Legend

	New Pavement		Wetland (4.21 acres impacted)
	New EMAS Bed		Threatened & Endangered Plant Species (2.82 acres impacted)
	Existing Pavement Removal		Project Limits of Disturbance
	Pavement Reconstruction		Airport Property Line

Igor I. Sikorsky Memorial Airport

See Insert for Scale

Sources: Imagery (esri/State of CT., 2019)

Figure 3-5
Alternative 5B

V:\Projects\ANY\K6\067655\000\09_Design\Exhibits\Report\Figures\Figure 3-5 Alternative 5B.dwg

Finally, existing pavement that is deteriorated and/or causing non-standard conditions will be removed. Approximately 401,000 square feet of impervious will be removed, and 135,000 square feet of new impervious will be added. This alternative would impact 4.2 acres of tidal wetlands that are immediately adjacent to the runway pavement and within the proposed EMAS bed and new RSA on the western end of the runway. The preliminary cost for Alternative 5B is \$18 million. Some advantages and disadvantages of Alternative 5A are listed below.

Alternative 5B: Shift Runway 300 Feet West & Install EMAS On Both Runway Ends	
Advantages	Disadvantages
<ul style="list-style-type: none"> ➤ Provides the standard 600 feet of RSA for arrivals on both Runway 11 and 29 ➤ Provides adequate area for standard EMAS beds on both ends of the runway 	<ul style="list-style-type: none"> ➤ More expensive than Alternative 5A ➤ Would require culverting approximately 630 feet of a tidal ditch ➤ Would impact approximately 2.2 more acres of tidal wetlands than Alternative 5A.

3.5.3 Obstruction Removal

As previously discussed, BDR has multiple obstructions to the FAR Part 77 surfaces and Obstacle Clearance Surfaces that are required to be clear to meet FAA design standards. An obstruction survey, completed as part of the Master Plan and ALP update, revealed existing and future penetrations to various surfaces (see Figure 3-6). These selective obstruction removals, both on and off airport, would be a part of both Alternative 5A and Alternative 5B. Any proposed obstructions for removal located within delineated wetlands will be cut and removed; however, the stumps root systems of all felled trees will be allowed to remain in place to preserve the existing soil stability and topographic profile. Mechanized removal of the trees using low-ground pressure forestry equipment will be permitted during the winter when the ground is frozen. Should this not be possible, the cutting and removal will be accomplished through hand felling and skidding with equipment designed to provide minimal disturbance to the surrounding vegetation.

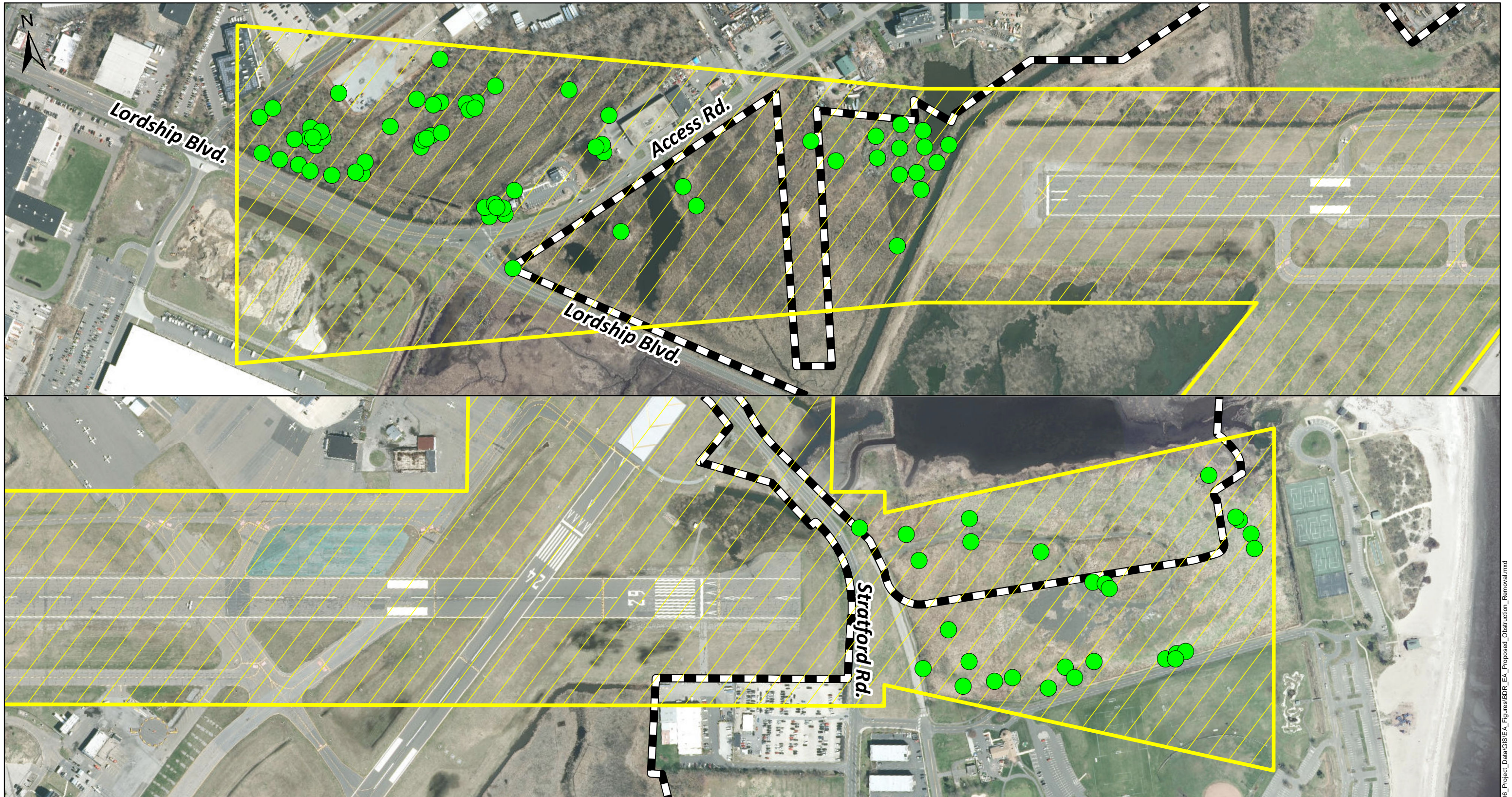
3.5.4 Alternative 6: No-Build Alternative

The No-Build Alternative considers taking no action for improving the safety areas on Runway 11-29. In this alternative, BDR would maintain its current airfield layout, including the non-standard runway safety areas off the ends and sides of Runway 11-29.




FAA Order 5200.8 requires that *“whenever a project for a runway involves construction, reconstruction (includes overlays), or significant expansion, the project shall also provide for improving the RSA.”* While the No-Build Alternative does not meet this project’s purpose and need, it serves as a baseline for comparing impacts related to any build alternative retained for analysis. It is also noted that the No-Build Alternative does not eliminate potential environmental and social impacts. Potential aircraft incidents caused by overrunning the runway or leaving the runway environment could create environmental damage to wetlands and habitats and endanger emergency responders and even persons and property on the ground.

3.6 ALTERNATIVES CARRIED FORWARD

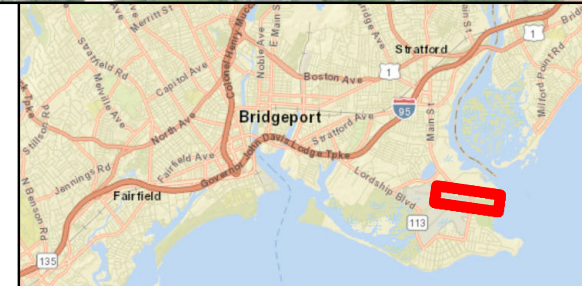
Alternative 5B would provide safety areas laterally and beyond both ends to meet FAA standards; however, its impact on the environment is greater than Alternative 5A. Although Alternative 5A would



Legend

-  Airport Property Boundary
-  Study Area
-  Tree Obstruction

Igor I. Sikorsky Memorial Airport



Sources: Imagery (esri/State of CT., 2019)

Figure 3-6
Proposed Obstruction Removal

provide standard RSA laterally and add additional safety to RSA off the ends of the runway for both arriving and departing aircraft, it would not meet the full FAA design standards of both ends as there would not be enough room for an EMAS bed and set back distance from the runway end to stop the design aircraft at 70-knot exit speeds. However, Alternative 5A would minimize the impacts on tidal wetlands more than Alternative 5B (4.21 acres versus 1.7 acres and no impact on the tidal ditch on the 11 end). Given the need to avoid, if possible, and then minimize environmental impacts, Alternative 5B will not be carried forward for further analysis in Environmental Consequences. FAA Order 5200.8 does allow the FAA to make an RSA determination of "*the existing RSA can be improved to enhance safety, but the RSA will still not meet current standards,*" which is the intent of Alternative 5A. Therefore, Alternative 5A: *Shift Runway 150 Feet West & Install EMAS On Both Runway Ends* and Alternative 6: *No-Build Alternative* are carried forward to the Environmental Consequences section of the EA.

4 AFFECTED ENVIRONMENT

The following background information is provided to establish the context of the surrounding community as it relates to BDR. This section describes land uses, natural resources, cultural resources, regional population data, and economic statistics. The information provided in this chapter serves as the basis for the assessment of potential environmental, social, and economic impacts in Chapter 5.

4.1 STUDY AREA

As part of this EA, two study areas were defined to assess the potential direct and indirect impacts of the Sponsor's Proposed Action on environmental resources. The detailed study area identifies the areas that may be physically disturbed with the development of the Sponsor's Proposed Action (e.g., ground disturbance). The generalized study area includes the areas surrounding the Sponsor's Proposed Action components that may not be physically altered but account for resources that may be affected by the Sponsor's Proposed Action.

4.1.1 Detailed Study Area

The detailed study area, which covers a much smaller area, includes the land areas that may be physically disturbed by the proposed project. A detailed study area boundary was developed using the anticipated direct impacts for the project. As shown in Figure 4-1, the detailed study area includes an area around Runway 11-29, associated taxiways, the Runway 24 end, and the RPZs for Runway 11-29, including a Superfund site to the east.

4.1.2 Generalized Study Area

The generalized study area is located entirely in the Town of Stratford and identifies resources within 0.5 miles of the detailed study area (see Figure 4-2). It is bounded by Great Meadows Marsh to the southwest, the coastal community of Lordship to the southeast, the Housatonic River and Long Island Sound to the east, and the South End neighborhood to the north.




4.2 AIR QUALITY

In accordance with the Clean Air Act (CAA) Amendments of 1990, all areas within Connecticut are designated with respect to compliance, or degree of noncompliance, with the National Ambient Air Quality Standards (NAAQS). The generalized study area is in Fairfield County, which is a part of the New Jersey-New York-Connecticut Interstate Air Quality Control Region (40 CFR 81, Subpart B, §81.13). NAAQS have been established for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM)⁴, and lead (Pb) (see Table 4-1). These designations are either attainment, nonattainment, or unclassifiable. An area with air quality better than the NAAQS is designated as "attainment;" an area with air quality worse than the NAAQS is designated as "non-attainment." Non-attainment areas are further classified as extreme, severe, serious, moderate, and marginal. An area may be designated as unclassifiable when there is a lack of data to form a basis of attainment status. When the air quality in a non-attainment area improves and the applicable NAAQS is met, the area is

⁴ Particulate matter is classified by the aerodynamic diameter of the particles. Coarse particulate matter has a diameter of 10 microns or less (PM₁₀). Fine particulate matter has a diameter of 2.5 microns or less (PM_{2.5}).

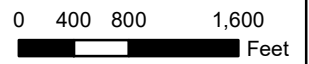
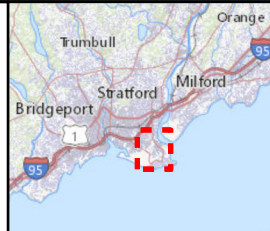


Legend

-  Detailed Study Area
-  Airport Property Boundary
-  Town Boundary




**Figure 4-1
Detailed Study Area**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



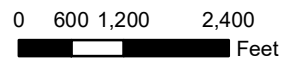
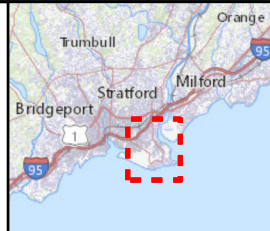


Legend

-  Airport Property Boundary
-  Generalized Study Area
-  Town Boundary

**Figure 4-2
Generalized Study Area**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



redesignated as a “maintenance area.” Certain requirements apply in the maintenance area to ensure continued compliance with the NAAQS.

Table 4-1: National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary/Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead (Pb)	Primary & Secondary	3-month average	0.15 µg/m ³	Not to be exceeded
Nitrogen Dioxide (NO ₂)	Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary & Secondary	1-year	53 ppb	
Ozone (O ₃)	Primary & Secondary	8-hour	0.075 ppm (2008) 0.070 ppm (2015)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter (PM _{2.5})	Primary	1-year	12.0 µg/m ³	Annual mean, averaged over 3 years
	Secondary	1-year	15.0 µg/m ³	98th percentile, averaged over 3 years
	Primary & Secondary	24-hour	35 µg/m ³	Not to be exceeded more than once per year
Particulate Matter (PM ₁₀)	Primary & Secondary	24-hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂)	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: EPA; CFR, Title 40, Part 50, Section 121.

4.2.1 Attainment/Non-Attainment Status

According to the U.S. Environmental Protection Agency (EPA), Fairfield County is designated as a non-attainment area for the 2008 and 2015 ozone standards. Fairfield County is designated as a maintenance area for CO and PM_{2.5}. Fairfield County is designated as an attainment area for all other criteria pollutants.

4.3 EXISTING NOISE

FAA Order 1050.1F requires the evaluation of potential noise impacts for existing and future airport conditions. The required FAA tool for evaluating noise exposure associated with airport activity is the Aviation Environmental Design Tool (AEDT). AEDT is designed to estimate long-term average effects using average daily input conditions. FAA’s approved version at the time of update, AEDT Version 2d, SP2³, was utilized to develop the noise maps. Since BDR just completed a Noise Exposure Map (NEM) update in 2021, that information was utilized for this EA.

4.3.1 Aviation Environmental Design Tool (AEDT)

AEDT works by first defining a network of reference points to measure noise at ground level around the airport. Flight tracks and aircraft performance profiles are created within the program based on operational conditions. AEDT then selects the shortest distance from each flight track to each reference point and computes the noise exposure generated by each aircraft operation. Adjustments are applied for airport climate and environmental characteristics, atmospheric acoustical attenuation, aircraft thrust variations, and time of operation. Night-time operations, those occurring between the hours of 10:00 p.m. and 7:00 a.m., are attributed a 10-decibel penalty (perceived as twice as loud). The noise exposure levels for each aircraft are then summed at each reference point to provide a day-night average noise level (DNL). DNL is a 24-hour logarithmic average sound level expressed in A-weighted decibels (dBA), as approved by the FAA. The cumulative noise exposure levels at all reference points are then used to plot noise exposure contours for selected DNL values and superimposed onto a base map. Noise contours generated by the AEDT represent outdoor noise levels and depict generally expected average daily noise exposure at a relative location rather than noise levels for a single aircraft event. Noise exposure on any one day may be greater or less than the average day.

4.3.2 Operational Forecasts

To update the NEM, flight tracks were provided from a full calendar year of 2018 National Offload Program (NOP) data. The NOP is a repository of National Airspace System data, maintained by the FAA, that collects and stores Instrumental Flight Rules flight track information from FAA surveillance. These operations were scaled by category to forecast operations for 2021 and 2026. Forecasts were then confirmed to be within 15% of the FAA Terminal Area Forecast and approved by the FAA. This process was completed as part of the NEM Update in 2020 and 2021. Operational projections are summarized in Table 4-2. Itinerant operations are arrivals or departures that do not remain within the airport traffic pattern and/or originate from another airport (i.e., visiting aircraft). Local operations are those that remain within the airport traffic pattern and are mostly associated with training activity and flight instruction (e.g., touch-and-goes). According to the NEM, BDR was expected to see a total of 50,923 operations, consisting of 23,887 itinerant operations and 27,036 local operations in 2021. By 2026, these operations are projected to grow to 53,332 operations. For the purposes of this analysis, 2021 operations were utilized to evaluate existing conditions.

Table 4-2: Forecast of Aircraft Operations – 2021 and 2026

Operation Type	User Class	2021 Operations		2026 Operations	
		Annual	Average Annual Day	Annual	Average Annual Day
Itinerant	Air Taxi*	3,179	8.7	3,330	9.1
	General Aviation	20,600	56.3	21,578	59.1
	Military	108	0.3	108	0.3
Local	General Aviation	26,962	73.7	28,242	77.4
	Military	74	0.2	74	0.2
Total		50,923	139.1	53,332	146.1

*The Master Plan forecast does not distinguish between air taxi and general aviation itinerant operations. The percentage split within the most recent full year of FAA OPSNET radar data at the time of the analysis (calendar year 2018) was applied to the combined total in the Master Plan to split the operations into the categories above.

4.3.3 Fleet Mix

The AEDT fleet mix was determined by reviewing historical activity from the FAA's NOP database. Over 4,500 individual flight tracks were directly used for the preparation of noise contours. All radar flight tracks that could be matched to a valid operation type, runway, and AEDT aircraft type were utilized in the noise modeling. Representative average model tracks were constructed to model touch-and-goes rather than using individual radar flight paths directly in AEDT.

4.3.4 Land Use Compatibility Guidelines

FAA Regulation, Part 150, *Airport Noise Compatibility Planning*, is the primary federal regulation guiding and controlling planning for aviation noise compatibility on and around airports. Within this regulation, the FAA provides guidelines for evaluating various land uses inside aircraft noise exposure areas. Land use compatibility of various activities is keyed to DNL values calculated in AEDT. The guidelines reflect the statistical variability of the responses of large groups of people to noise. Therefore, any noise level might not accurately assess one individual's perception of an actual noise environment.

All land uses are considered compatible with noise levels of less than 65 DNL. Residential, mobile home, and transient lodging uses are discouraged from 65 DNL and higher. Other noise-sensitive uses such as hospitals, nursing homes, and churches are also discouraged in 65 DNL or greater. In certain cases, these uses may be permitted if the structure is designed with, or contains, adequate measures to achieve a reduction of outdoor noise levels (soundproofing). Land uses that are less sensitive to noise levels, such as commercial use, are considered compatible with noise levels of 70 DNL without soundproofing and up to 80 DNL with soundproofing.

4.3.5 Noise Contours

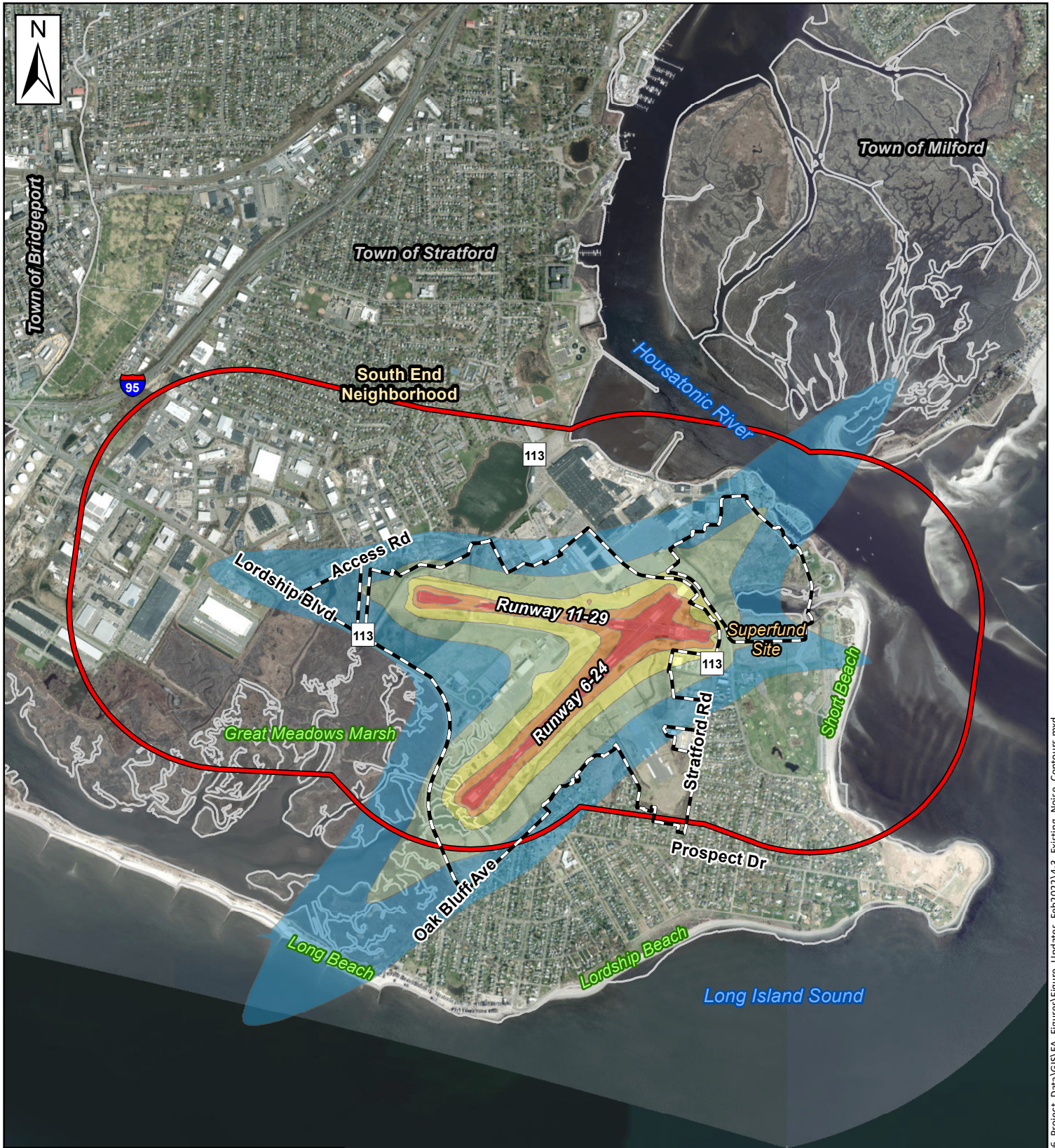
Existing noise contours are presented for the 65, 70, and 75 DNL (see Figure 4-3). Additionally, the 55 and 60 DNL are included for informational purposes only. DNL contours are a graphic representation of how the noise from BDR's annual average daily aircraft operations is distributed over the surrounding area. DNL represents an average sound level over the course of an average annual day. Noise contours extend from the airport along each extended runway centerline, reflective of the flight tracks used by all aircraft. The relative distance of a contour from the airport along each route is a function of the frequency of use of each runway end for total aircraft arrivals and departures, the type of aircraft assigned to it, and the time of day of the flight. As shown in Figure 4-3, the 65 DNL contour does not leave airport property.

4.4 LAND USE & ZONING

The existing land use patterns on and around BDR, as shown in Figure 4-4, were identified primarily through the review of Geographic Information System (GIS) data supplied by the Connecticut Metropolitan Council of Governments. Aerial photography and GIS databases provided relevant information for the base map, such as parcels, roads, and other land uses. The subsections describe existing land use in terms of generalized land use patterns, land use plans, and land use controls.

4.4.1 Land Use

Land uses within the generalized study area include Airport Operations, Residential, Commercial, Industrial, and Open Space.



Legend

Airport Property Boundary

Generalized Study Area

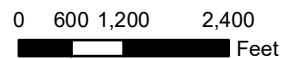
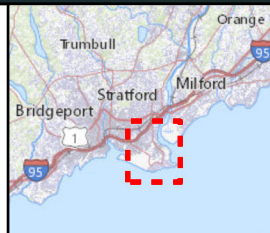
Town Boundary

Noise Contour (dB)

- 75
- 70
- 65
- 60
- 55

**Figure 4-3
Existing Noise Contours**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



Source: Noise Contours (HMMH, 2021)





Legend

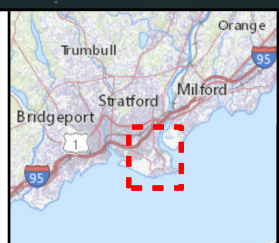
- Airport Property Boundary
- Generalized Study Area
- Town Boundary

Land Use

- Airport Operations
- Cemetery
- Commercial
- Industrial
- Open Space
- Residential
- School

Figure 4-4
Existing Land Use

Igor I. Sikorsky Memorial Airport
 Short-Term Projects EA



0 600 1,200 2,400
 Feet

Source: Land Use (FHI)

4.4.2 Zoning

According to existing zoning data provided by the Town of Stratford in September of 2021, the generalized study area is currently zoned as Industrial, Multi-Family Residential, Resource Conservation, Retail Commercial, Single-Family Residential, and Waterfront Business (see Figure 4-5).

4.4.3 Schools

No K-12 schools are located within the generalized study area; however, the Stratford School for Aviation is located on airport property.

4.4.4 Religious Institutions

Three religious institutions are located within the generalized study area. St. Joseph of Stratford National Catholic Church (1300 Stratford Rd.) is located south of the airport. Philadelphia Church (909 Main St.) and Covenant Life Ministries/Ladies of Virtue (959 Main St.) are located northeast of the airport.

4.4.5 Wildlife Attractants

Based on a review of the Connecticut Department of Energy and Environmental Protection (DEEP) List of Active Landfill Sites in Connecticut, no active solid waste landfills are near BDR. The Short Beach Park and Stratford Landfill, located east of the airport, is no longer in use. The nearest wastewater treatment facility is approximately 3.2 miles northeast of the airport (Town of Stratford Water Pollution Control Facility). As noted in FAA AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, solid yard waste compost and enclosed transfer/recycling facilities generally do not attract hazardous wildlife and are therefore generally compatible with safe airport operations. There are no open landfills, wastewater treatment, or other facilities expected to attract wildlife hazards within the generalized study area.

4.5 BIOLOGICAL RESOURCES

This section describes biological resources within the detailed study area. Information in this section was collected through fieldwork and coordination with the U.S. Fish & Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website and the CT DEEP Natural Diversity Data Base (NDDB).

4.5.1 Federally Protected Species

The United States Congress passed the Endangered Species Act of 1973 (ESA), as Amended 16 U.S.C. §1531 et seq., to conserve those species that are endangered or threatened with extinction (federally listed species). The ESA also provides for the protection of designated critical habitat on which endangered or threatened species depend for survival. Under Section 7 of the ESA, the FAA is required to consult, at a minimum, with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS), as applicable, to ensure that any action the FAA authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

The potential occurrence of federally listed threatened and endangered species in the detailed study area was evaluated using the USFWS IPaC online system (USFWS, 11/19/21). For this resource assessment, the entire airport property was considered the area of review. The IPaC official species list indicates Northern Long-eared Bat (*Myotis septentrionalis*, federal threatened), Roseate Tern (*Sterna dougallii dougallii*, federal and state endangered), Red Knot "rufa" subspecies (*Calidris canutus rufa*, federal threatened), and Monarch Butterfly (*Danaus plexippus*, federal candidate species) should be considered in an effects



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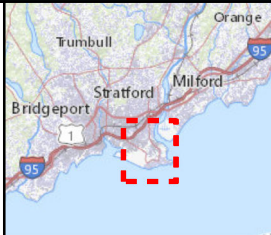
- Airport Property Boundary
- Generalized Study Area
- Town Boundary
- Church

Existing Zoning

- Industrial
- Limited Business
- Multi-Family Residential
- Resource Conversation
- Retail Commercial
- Single-Family Residential
- Waterfront Business

**Figure 4-5
Existing Zoning**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



0 600 1,200 2,400
Feet

Source: Zoning (Town of Stratford, CT, 2021)

analysis for the project (see Appendix B for the full IPaC summary). The IPaC report also stated that there is no designated critical habitat in the detailed study area. The habitat preferences for these federally listed or candidate species and their potential to occur in the study area are presented in Table 4-3.

Table 4-3: Federally Listed or Candidate Terrestrial Species Potentially Occurring in the Study Area

Species	Federal Status	Species Habitat Preferences and Potential to Occur in the Study Area
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened (also state-endangered)	Summer habitat for the Northern Long-eared Bat includes wooded areas, fencerows, and riparian corridors of trees >3 inches at diameter breast height with sufficient bark crevices, cavities, or exfoliating bark and snags for roosting. Some trees in the study area could provide summer roosting habitat; however, there are no trees within the portions of BDR that are maintained as runways, taxiways, and mowed areas. During the winter, the Northern Long-eared bat hibernates in caves or mines (i.e., hibernacula). According to CT DEEP records, no caves or mines on or within ¼-mile of the study area nor any within Stratford could be utilized as hibernacula for this species. There are no CT DEEP records of known maternity roost trees within the study area or the surrounding area (CT DEEP, 2019).
Roseate Tern (<i>Sterna dougalii dougalii</i>)	Endangered (also state-endangered)	Roseate Tern breeds on islands free of predators and human disturbance, and it forages over open water. The closest breeding colony to the study area is on Falkner Island in Guilford (approximately 24 miles east of BDR). The Roseate Tern forages over shallow sandbars, shoals, and inlets for small fish (Poole, A., 2005). These open water habitats are not present in the study area.
Rufa Red Knot (<i>Calidris canutus rufa</i>)	Threatened	Rufa Red Knot breeds in the central Canadian Arctic and winter in four regions from the southeast United States to the southern tip of South America (USFWS, 2020). This species is found along barrier beaches in Connecticut during its northbound and southbound migrations. There are no barrier beaches in the study area that could provide migratory habitat for this species.
Monarch Butterfly (<i>Danaus plexippus</i>)	Candidate	Monarch Butterfly has recently become a candidate for listing under the ESA. During breeding and migration, adult monarchs occur in various habitats with blooming nectar resources that they feed on; they require milkweed host plants (primarily <i>Asclepias</i> spp.) for reproduction. Monarchs use various roosting trees during the fall migration (USFWS, 2020). Developed and mowed areas in the study area do not provide habitat for this species. Monarchs could utilize the undeveloped portions of the study area where flowering plants are present and trees in the undeveloped portions of the study area for roosting.

Source: USFWS, IPaC (2021).

According to the National Oceanic and Atmospheric Administration’s (NOAA) Section 7 Mapper (accessed September 9, 2021), the following threatened and endangered aquatic species may also be found in the waterways adjacent to the detailed study area:

- Atlantic Sturgeon (subadult and adult) (*Acipenser oxyrinchus oxyrinchus*, federal and state endangered)
- Shortnose Sturgeon (adult) (*Acipenser brevirostrum*, federal and state endangered)
- Green Turtle (adult and juvenile) (*Chelonia mydas*, federal and state threatened)
- Kemp’s Ridley Turtle (juvenile and adult) (*Lepidochelys kempii*, federal and state endangered)

- Leatherback Sea Turtle (juvenile and adult) (*Dermochelys coriacea*, federal and state endangered)
- Loggerhead Sea Turtle (juvenile and adult) (*Caretta caretta*, federal and state threatened)

The waterways include the Housatonic River, Long Island Sound, and the tidal creeks in Lewis Gut. The only waterway within the study area where these species are shown is the Marine Basin east of Stratford Road (Route 113). According to the Sea Turtle Sightings Hotline for Southern New England Boaters (2021), there have been no sightings of sea turtles in Marine Basin, the Housatonic River, or Lewis Gut.

4.5.2 Migratory Birds

Pursuant to the Migratory Bird Treaty Act of 1918 (16 U.S.C. §§703-712), it is illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid federal permit. The Bald and Golden Eagle Protection Act (16 U.S.C. §668-668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald or golden eagles, including their parts, nests, or eggs.

The USFWS IPaC report provided a list of 39 migratory bird species that may occur on, or in the vicinity of, the detailed study area. A list of these migratory birds can be reviewed in the USFWS IPaC report found in Appendix B. The birds are of particular concern because they occur on the USFWS Birds of Conservation Concern list or warrant special attention in the project location.

4.5.3 State Protected Species

Under provisions of the ESA, all states were granted authority to create their own endangered species protection policies. The Connecticut Endangered Species Act, passed in 1989, recognizes the importance of the state’s plant and animal populations and the need to protect them from threats that could lead to their extinction. Connecticut General Statutes (CGS) Chapter 495 and its implementing regulations protect the state-listed endangered and/or threatened plants and animals and their occupied habitat. The potential occurrence of state-listed threatened, endangered, and special concern species on, and in the vicinity of, the detailed study area was evaluated by reviewing the CT DEEP NDDDB mapping, coordinating with the CT DEEP NDDDB, conducting a limited listed plant species survey (FHI Studio, 2021), reviewing the findings of the state-listed bird survey for the 2013 Runway Safety Area Project (URS Corporation et al., 2013), and reviewing the findings of the rare moth surveys for the 2013 Runway Safety Area Project (GZA GeoEnvironmental, Inc., 2013). The listed plant survey was conducted in the late summer and fall of 2021 (see Appendix C).

State Listed Avian and Herpetofauna Species

State-listed avian and herpetofauna species identified by CT DEEP in their NDDDB Preliminary Assessment, as well as those observed in the study area during the 2021 fieldwork, are presented in Table 4-4.

Table 4-4: State Listed Avian and Herpetofauna That May Be Present in the Study Area

Species	State Status	Species Habitat Preferences and Potential to Occur in the Study Area
Upland Sandpiper (<i>Bartramia longicauda</i>)	Endangered	According to the CT DEEP, Upland Sandpipers prefer pastures, upland meadows, fallow fields, and similar open, grassy areas for habitat. This area includes dry, open, grassy habitats rather than wetlands.
Horned Lark (<i>Eremophila alpestris</i>)	Endangered	Horned Lark nests in large, open areas that are barren, sandy, stony, or sparse in grass cover. In Connecticut, Horned Lark nests on beaches and open areas, mostly along the coast. Breeding has been documented in grassland areas at airports. It is not likely to be found in areas with substantial cover.
Pied-billed Grebe (<i>Podilymbus podiceps</i>)	Endangered	Open water areas underlain by submerged aquatic vegetation provide potential winter foraging habitat.
American Bittern (<i>Botaurus lentiginosus</i>)	Endangered	American Bittern prefers salt and brackish marsh/secluded marshes with little to no human disturbance.
Barn Owl (<i>Tyto alba</i>)	Endangered	Open areas (salt marsh and coastal upland grasslands) provide productive foraging areas.
Least Bittern (<i>Lxobrychus exilis</i>)	Threatened	Least Bittern prefers freshwater and brackish marshes with dense, tall growths of emergent vegetation (e.g., Typha, Phragmites). It is occasionally found in salt marshes.
Saltmarsh Sharp-tailed Sparrow (<i>Ammodramus caudacutus</i>)	Special Concern	Saltmarsh Sharp-tailed Sparrow prefers Salt Marsh/High marsh zones dominated by Salt Meadow Cordgrass, Spike Grass, and Black Grass for nesting and cover and tidal mudflats for foraging.
Savannah Sparrow (<i>Passerculus sandwichensis</i>)	Special Concern	Savannah Sparrow prefers open grassy areas. Field margins provide migration foraging habitat and cover.
Ipswich Sparrow (<i>Passerculus sandwichensis ssp.princeps</i>)	Special Concern	Ipswich Sparrow prefers beach dunes and other sandy coastal habitats during migration and wintering. It breeds only in Canada.
Northern Harrier (<i>Circus cyaneus</i>)	Endangered	Northern Harrier prefers salt marshes and other extensive grasslands. Other open areas provide foraging habitats during migration. It was observed during the 2021 fieldwork.

Species	State Status	Species Habitat Preferences and Potential to Occur in the Study Area
Great Egret (<i>Ardea alba</i>)	Threatened	Great Egret frequents marshes in search of fish, frogs, snakes, crayfish, aquatic insects, or other invertebrate prey. It is not currently known to breed within the marshes adjacent to the BDR but visits them for foraging, as post-breeding summer dispersals, and during migratory movements. It was observed during the 2021 fieldwork.
Snowy Egret (<i>Egretta thula</i>)	Threatened	Snowy Egret frequents marshes in search of fish, frogs, snakes, crayfish, aquatic insects, or other invertebrate prey. It is not currently known to breed within the marshes adjacent to the BDR but visits them for foraging, as post-breeding summer dispersals, and during migratory movements. It was observed during the 2021 fieldwork.
Northern Diamondback Terrapin (<i>Malaclemys terrapin terrapin</i>)	Special Concern	Northern Diamondback Terrapin is often found foraging within tidal creeks where it hunts mollusks, snails, invertebrates, and carrion. It also depends on tidal creeks as hibernation sites, either burrowing down into the soft mud of the benthic substrate or into the side of the creek beneath undercut banks. It uses adjacent sandy areas associated with estuaries for nesting. A terrapin was observed during the 2021 field survey.

Source: CT DEEP NDDDB Preliminary Assessment and FHI Studio, 2021.

State Listed Plants






The plant surveys were performed by a qualified botanist with demonstrable knowledge of the target species and their ecological characteristics in southeast Connecticut. The geographic extent of the survey encompassed the potential disturbance footprint adjacent to the runways. All plant species identified for survey were identified during the late summer/fall survey period except for Hoary Plantain (*Plantago virginica*, special concern), which is a spring ephemeral. This species will be surveyed during the permitting phase of the project. The results of the 2021 survey are summarized in Table 4-5. The general location of threatened and endangered plant species within the detailed study area is depicted in Figure 4-6.

Table 4-5: State Listed Plant Species Observed in the Study Area During 2021 Survey

Species	State Status	Reported Requisite Habitat
Saltpond Grass (<i>Leptochloa fusca</i> ssp. <i>fascicularis</i>)	Endangered	Brackish marshes along the coast, occasionally in waste places, saline marshes, coastal beaches, roadsides, and disturbed ground
Field Beadgrass (<i>Paspalum laeve</i>)	Threatened	Old fields, thickets, lakeshores, pine or mixed woodlands, woods openings, and roadsides
Needlegrass (<i>Aristida longespica</i> var. <i>geniculata</i>) (<i>Aristida longespica</i> var. <i>longespica</i>)	Special Concern	Moist or dry, often sterile or sandy soil, sandy fields, roadsides, woodland openings, and disturbed sandy soils

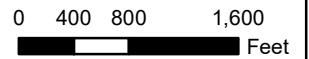
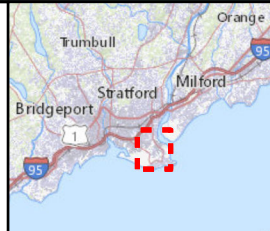


Legend

-  Airport Property Boundary
-  Approximate Listed Plant Survey Limit
-  Town Boundary
-  T&E Individual
-  T&E Population

**Figure 4-6
Listed Species Survey**

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Species	State Status	Reported Requisite Habitat
Eastern Prickly Pear Cactus (<i>Opuntia humifusa</i>)	Special Concern	Open, dry areas, often on calcareous rock or thin soils, and in or on fencerows, roadsides, rocky glades, rock outcrops, cliffs, old quarries, dunes, and prairies
Beach Orache (<i>Atriplex glabriuscula</i>)	Special Concern	Sea beaches, saltmarshes, waste places, saline marshes, and strands

Source: FHI Studio, 2021.

The CT DEEP NDDDB database Preliminary Assessment was received in December 2021, after completing the field survey (see Appendix B). The NDDDB Preliminary Assessment also identified Marsh Pink (*Sabatia stellaris*) for survey. Along with Hoary Plantain, the survey for the marsh pink will be conducted during the project’s permitting phase.

State List Invertebrates

The NDDDB Preliminary Assessment identified the state-listed Saltmarsh Tiger Beetle (*Cicindela marginata*), also known as the Mudflat Tiger Beetle, as a species that has been present in the detailed study area. This species was inadvertently documented during black light trapping in a 2012 survey by GZA GeoEnvironmental Inc. (2013). The Saltmarsh Tiger Beetle, a species of special concern, is generally associated with areas of open ground. It lays eggs in the sediment, and at the larval stage, it creates and lives within a burrow where the eggs were laid. It prefers saline mudflat habitats, including fine sediments and organics deposited at river mouths, and is often associated on the bay side of barrier beaches.

4.5.4 Species of Concern

Essential Fish Habitat (EFH) is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” According to the NOAA EFH Mapper (NOAA, 2021), the detailed study area is included in a larger grid area mapped by NOAA, NMFS as EFH for the following species:

- Winter Flounder (eggs, juvenile, larvae/adult)
- Little Skate (juvenile, adult)
- Atlantic Herring (juvenile, adult)
- Pollock (adult, juvenile)
- Red Hake (adult, eggs/larvae/juvenile)
- Silver Hake (eggs/larvae, adult)
- Monkfish (juvenile)
- Windowpane Flounder (adult, larvae, eggs, juvenile)
- Winter Skate (adult, juvenile)
- Scup (larvae, eggs, juvenile, adult)
- Longfin Inshore Squid (juvenile, adult, eggs)
- Atlantic Mackerel (eggs, larvae, juvenile, adult)
- Bluefish (adult, juvenile)
- Atlantic Butterfish (eggs, larvae, adult)
- Summer Flounder (juvenile, adult)
- Black Sea Bass (juvenile)

4.5.5 Ecological Communities

Nine wetland systems were identified within the detailed study area and are discussed in detail in Section 4.13.1. Most of the wetlands within the study area have been subject to past disturbance. Three of the wetlands are larger tidal wetland complexes that have been disturbed by past filling and draining activities or are adjacent to the mowed areas around the west end of Runway 11-29 and consist largely of

constructed channels and a mix of common reed-dominated and native spartina-dominated tidal marshes. The remaining wetlands in the detailed study area drain to the east to the Housatonic River via the Marine Basin. Most of these wetlands are within the maintained areas around the east ends of Runway 11-29 and Runway 6-24. Additionally, one wetland is located east of Stratford Road and is comprised of vegetated tidal wetlands associated with the Marine Basin itself. Wetlands in the southern portion of BDR are generally high-value spartina-dominated tidal wetlands connected to the Stewart B. McKinney National Wildlife Refuge to the south of Route 113.

The upland ecological communities (i.e., habitats) at BDR are predominantly areas of maintained grass and herbaceous species adjacent to paved surfaces, including runways, taxiways, buildings, and airplane and automobile parking areas. In addition to common grass and herbaceous species, several state-listed plant species are present in these managed habitats. Protected plant and animal species in the study area are discussed in subsequent sections. The only upland areas that are not maintained grass are located on the northwest side of the west end of Runway 11-29 and in the undeveloped areas on the east side of Short Beach Road. These areas consist of a mix of small trees and shrubs along with mowed areas.

4.5.6 Wildlife

Wildlife species at the BDR are managed to prevent or reduce wildlife/bird strikes. The BDR Wildlife Hazard Management Plan is intended to discourage breeding and other usages of the airfield by wildlife through both passive and active means. However, the uplands do provide habitat for common, human tolerant, wildlife species such as gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), eastern cottontail (*Sylvilagus floridanus*), eastern chipmunk (*Tamias stratus*), and woodchuck (*Marmota monax*). For both security purposes and to prevent large mammals, such as white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*), from accessing the RSA, fencing is maintained around portions of the airfield.

The tidal marshes on and adjacent to airport property provide habitat for several vertebrate and invertebrate species. Wading birds such as the Great Blue Heron (*Ardea herodias*), Great Egret (*Ardea alba*), and Snowy Egret (*Egretta thula*) utilize the tidal marsh habitats. Aquatic habitats within the tidal marshes provide spawning, nursery, and feeding grounds for various commercially and recreationally important shellfish, finfish, and forage species.

4.6 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the ACHP. Revised regulations, Protection of Historic Properties (36 CFR Part 800), became effective January 11, 2001.

4.6.1 Area of Potential Effect

To consider the effect an undertaking may have on properties listed on or eligible for listing on the National Register of Historic Places (NRHP), an Area of Potential Effect (APE) must first be identified. According to 36 CFR Part 800.16(d), the APE is the geographic area or areas within which an undertaking may directly or indirectly alter the character or use of historic properties. Such changes may include physical destruction, damage, or alteration of a property; change in the character of the property's use or

of physical features within its setting that contribute to its historic significance; and introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features (36 CFR 800.5(a)(2)). The APE for this undertaking is the detailed study area and was coordinated with the Connecticut State Historic Preservation Office (SHPO).

4.6.2 Historic Architecture

According to correspondence received from SHPO on July 16, 2021, there are no previously reported properties listed on the NRHP recorded in the APE for this project.

4.6.3 Archaeological Resources

Two previously identified archaeological sites are located within the detailed study area. Several more are in the areas surrounding the detailed study area. According to the SHPO, Archaeological Site #138-7 is located north of the intersection of Access Road and Lordship Boulevard. Archaeological Site #138-14 is reported at the end of Runway 11. The presence of these resources indicates that the property is archaeologically sensitive. At the request of the SHPO, a Phase 1 Archaeological Reconnaissance Survey was performed by Archaeological Consulting Services (ACS) in September 2021 to further determine the presence of archeological resources. Despite a moderate sensitivity for potential prehistoric sites for some of the project area and the previously reported sites, no prehistoric artifacts or feature contexts were recorded within the APE. Therefore, ACS did not recommend further archaeological efforts. The SHPO was then provided the results of the Phase 1 survey. After review, SHPO stated in correspondence dated October 14, 2021, that no additional archaeological investigation is warranted and that no historic properties will be affected by the proposed undertaking. The findings of the Archaeological Reconnaissance Survey and coordination with the Connecticut SHPO can be found in Appendix D.

4.7 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F) PROPERTIES

Section 4(f) of the Department of Transportation (DOT) Act of 1966 (recodified in 1983 as Title 49, Section 303(c) of the USC) provides for the protection of publicly owned recreational resources and requires the analysis of potential impacts on these resources arising from DOT actions. Resources protected under Section 4(f) include public parks and recreation areas as well as wildlife and waterfowl refuges or management areas of national, state, or local significance. Section 4(f) also applies to historic sites of national, state, or local significance as determined by the official that has jurisdiction over these historic resources. Such sites include those that are listed or eligible for inclusion in the NRHP and those identified by appropriate state or local agencies as having historic significance.

4.7.1 Public Parks & Recreation Areas

A review of online mapping and field reconnaissance indicates that there are three publicly owned parks or recreational areas within the generalized study area.

- Short Beach Park: This public park is owned and operated by the Town of Stratford. Approximately 107 acres in size, it includes a campground, Short Beach, Short Beach Golf Course, and the Yeoman's Park & Athletic Field.
- Great Meadows Park: Owned by the City of Stratford, this open space park is approximately 0.5 acres and is located north of the airport adjacent to Frash Pond.

- Woodend Park: Owned by the Town of Stratford, this 0.25-acre playground is located just north of Great Meadows Park on the border of the generalized study area along Woodend Road (refer to Figure 4-5).

4.7.2 Wildlife Management Areas

The Great Meadows Unit of the Stewart B. McKinney National Wildlife Refuge is located on the west side of Lordship Boulevard and forms the western boundary of BDR.

4.7.3 Historic Sites

According to correspondence received from CT SHPO, there are no previously reported historic sites in the detailed study area for this project.

4.8 COASTAL RESOURCES

4.8.1 Coastal Barrier Resources Act

The Coastal Barrier Resources Act (CBRA) encourages the conservation of hurricane-prone, biologically rich coastal barriers by restricting federal financial assistance for the development of these ecosystems. Administered by the USFWS, the CBRA established the Coastal Barrier Resources System (CBRS), a designation of relatively undeveloped coastal barriers that serve as barriers protecting the Atlantic, Gulf, and Great Lakes.

The USFWS Coastal Barrier Resources System Mapper identifies the Great Meadows Unit of the Stewart B. McKinney National Wildlife Refuge as an Otherwise Protected Area (OPA). The only federal spending prohibition within an OPA is the prohibition of federal flood insurance. There are no other CBRS Units in the generalized study area.

4.8.2 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) is a federal law that provides for the management of the nation's coastal resources, including the Great Lakes. One of the programs outlined by the CZMA is the National Coastal Zone Management Program, which is a voluntary partnership among the Federal government and coastal and Great Lakes states and territories. Under this program, state governments design unique coastal zone management programs, which are subsequently approved by NOAA. Once these programs have been approved, the CZMA requires that any federal actions that could have a reasonably foreseeable impact on a state's coastal zone, even if the action occurred outside of the designated coastal zone, be consistent with the approved coastal management program for that state.

Connecticut does have an established Coastal Management Program, and the generalized study area is entirely within a designated Coastal Boundary. This program is managed by the CT DEEP, which has published a list of federal activities subject to consistency review. This list includes any activity by the FAA that includes "*location, placement, construction, expansion, demolition, or removal of, or land clearing for, air navigation facilities, including communications and radar facilities, performed through FAA's Facilities and Equipment Program, pursuant to 49 USC 44502, as amended and 49 USC 106(n), as amended.*"

4.9 SECTION 6(F) RESOURCES

The U.S. Land and Water Conservation Fund Act of 1965 established the Land and Water Conservation Fund (LWCF), which was created to preserve, develop, and assure accessibility to outdoor recreational resources. Section 6(f) of this Act prohibits the conversion of lands purchased with LWCF monies to a non-recreation use.

A review of 6(f) properties on the Land and Water Conservation Fund (LWCF) website revealed a total of 114 properties in Fairfield County. Nine of these properties are located within the generalized study area. Of the nine properties, eight are USFWS Programs in Stewart B. McKinney National Wildlife Refuge, and one is a State and Local Assistance Program in Short Beach Park.

4.10 FARMLAND

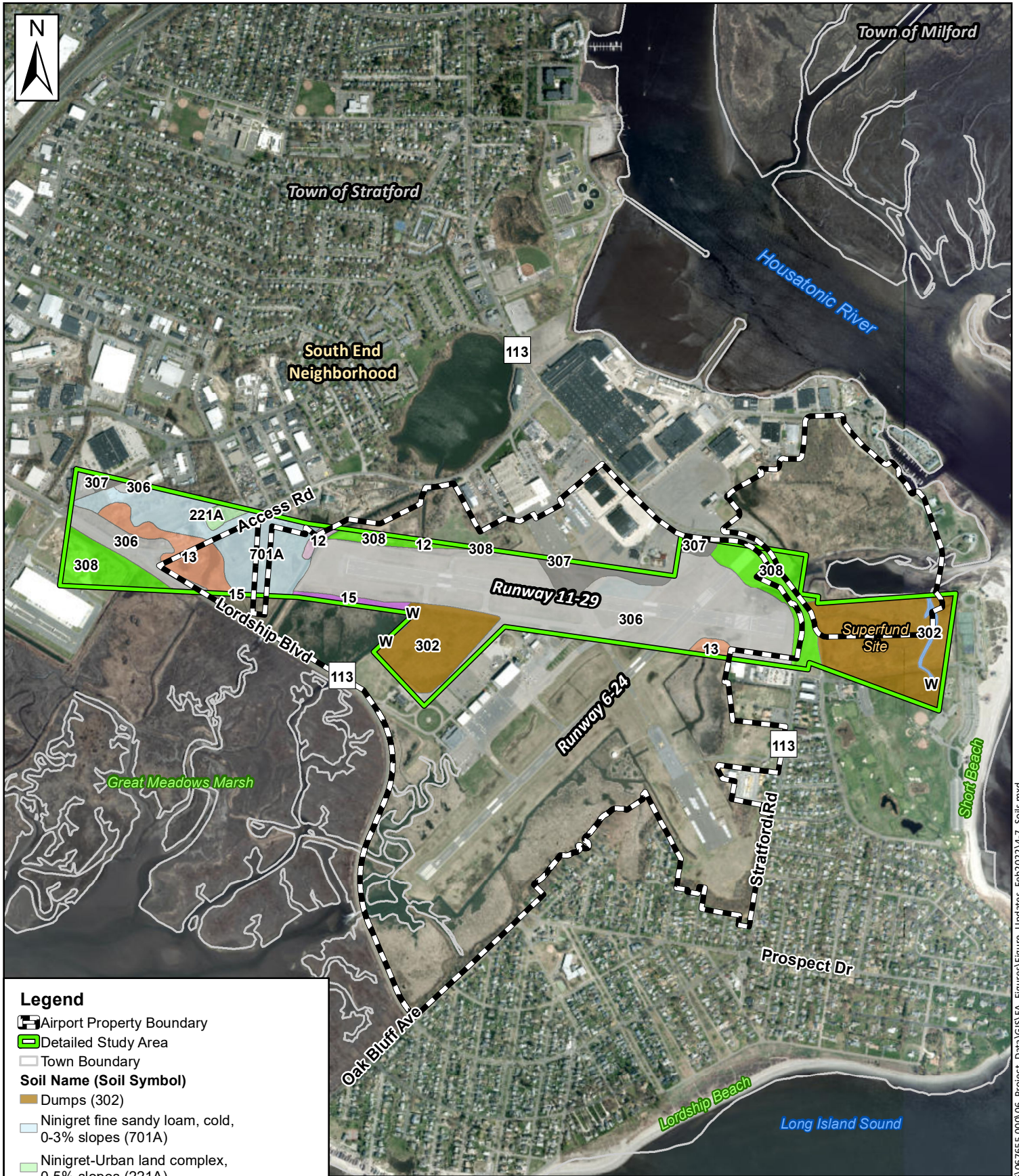
The Farmland Protection Policy Act (FPPA) (7 USC 4201-4209) of 1984 was implemented to protect and preserve farmland for agricultural use as part of the 1980 Farm Bill (PL 97-98, Title XV, Subtitle I; 7 USC 4201-4209). This policy, however, does not apply to land already committed to urban development or water storage, regardless of its importance as defined by the Natural Resource Conservation Service (NRCS). The guidelines recognize that the quality of farmland varies based on soil conditions and places a higher value on soils with high productivity potential. To preserve these highly productive soils, the NRCS classifies soil types as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. The NRCS requires that soils in these categories be given proper consideration before they are converted to non-farming uses by federal programs. According to the NRCS Web Soil Survey for Fairfield County, the following soil types, identified as prime farmland or farmland of statewide importance, are mapped within the project area (see Figure 4-7):

- 12 - Raypol silt loam - farmland of statewide importance
- 13 - Walpole sandy loam, 0 to 3 percent slopes - farmland of statewide importance
- 701A - Ninigret fine sandy loam, 0 to 3 percent slopes - all farmland areas are prime

4.11 HAZARDOUS MATERIALS

Hazardous waste is a general term relating to spills, dumping, and releases of substances that could threaten human and animal life. To identify these materials and protect the environment from harmful interaction with hazardous wastes, federal laws, and regulations, such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource, Conservation, and Recovery Act (RCRA), have been enacted. CERCLA prescribes a very specific process for the investigation and cleanup of sites listed on the National Priorities List (NPL), also referred to as Superfund sites. RCRA is the public law that creates the framework for the proper management of hazardous and non-hazardous solid waste. Hazardous waste impacts are typically associated with the current or future use, transfer, or generation of hazardous material within the limits of the proposed improvements or the acquisition of properties that contain hazardous materials. Environmental concerns related to solid waste disposal range from adequate landfills for normal urban trash and garbage to the safe disposal of industrial waste.

A review of online environmental databases maintained by the EPA was conducted to identify sites and facilities located in the study areas that may be of environmental concern from both a site contamination and a NEPA perspective.

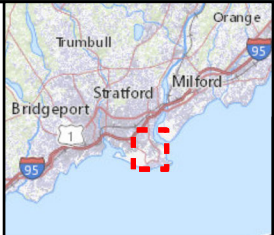


Legend

- Airport Property Boundary
- Detailed Study Area
- Town Boundary
- Soil Name (Soil Symbol)**
- Dumps (302)
- Ninigret fine sandy loam, cold, 0-3% slopes (701A)
- Ninigret-Urban land complex, 0-5% slopes (221A)
- Raypol silt loam (12)
- Scarborough muck (15)
- Udorthents, smoothed (308)
- Udorthents-Urban land complex (306)
- Urban Land (307)
- Walpole sandy loam (13)
- Water (W)

**Figure 4-7
Soils**

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0 400 800 1,600
Feet

Source: Soils (USDA, 2020)

The NPL contains the most serious uncontrolled or abandoned hazardous waste sites throughout the United States. One site listed on the NPL is partially located within the generalized study area. The Raymark Industries, Inc. Superfund site is divided into nine Operable Units. The ninth, Short Beach Park and Stratford Landfill, is located within the project area directly east of the Runway 29 end and Short Beach Road. The Stratford Landfill is no longer active. A temporary cap was installed on a portion of Short Beach Park where Raymark Waste was found to be present. The EPA completed a remedial investigation in 2005, finding no immediate risk to workers or recreational users. However, the EPA determined that a permanent remedy would be required to protect public health in the future.

The EPA's EnviroAtlas Interactive Map displays facilities that report to the EPA under RCRA. The following active RCRA sites are located within the generalized study area (listed from east to west):

- Park City Packaging (480 Sniffens Ln.)
- Atlantic Aviation (325 Main St.)
- Stratford Army Engine Plant (550 Main St.)
- Breezy Point Auto Body Inc. (75 Access Rd.)
- Advanced Graphic, Inc. (55 Old South Ave.)
- Sherwin-Williams (425 Benton St.)
- SBC SNET (1175 Woodend Rd.)
- Porter & Chester Institute (305 Hathaway Dr.)
- Technical Environmental Construction (325 Hathaway Dr.)
- Westport Precision, LLC (280 Hathaway Dr.)
- Bridgeport Fittings, LLC (705 Lordship Blvd.)
- SC Technologies, LLC (175 Garfield Ave.)
- Unifirst Corp (205 Garfield Ave.)
- Butterworths Truck & Diesel (45 Mayfair Pl.)
- Porter & Chester Institute (670 Lordship Blvd.)
- Food Automation Service Techniques, Inc. (905 Honeyspot Rd.)
- McMellon Bros Inc. (915 Honeyspot Rd.)
- Unifirst Corp (205 Garfield Ave.)
- Federal Express Corp (500 Lordship Blvd.)
- Coca-Cola Bottling Co. of NY (400 Long Beach Blvd.)

Figure 4-8 shows the Raymark Industries, Inc. Superfund site and all active RCRA facility locations.

4.12 SOCIAL & ECONOMIC CHARACTERISTICS

This section presents a discussion of the social, economic, and demographic characteristics surrounding the airport. Potential socioeconomic impacts of an airport improvement project are primarily related to the direct effects on home and business relocation, transportation systems, utilities, and other cultural and public facilities. It also involves consideration for potential effects on minority and low-income populations, as well as indirect impacts such as changes in growth patterns and community disruption.

Environmental Justice laws, regulations, and policies are found in Title VI of the Civil Rights Act of 1964, the National Environmental Policy Act of 1969, Title 23 of the USC, Section 109(h), the Uniform Relocation, and Real Properties Acquisitions Policy Act of 1970, and most recently, Executive Order (EO) 12898: Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. EO 12898 directs each Federal agency to develop a strategy addressing environmental justice concerns in its programs, policies, and regulations. The purpose of this Order is to avoid disproportionately high and adverse human health or environmental impacts on minority and low-income populations. On July 16, 1997, the DOT issued its Final Order on Environmental Justice as Order 5610.2. To identify minority and low-income populations in the project area, demographic data from the U.S. Census Bureau, 2019 American Community Survey 5-year Estimates was reviewed and compiled.

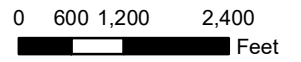
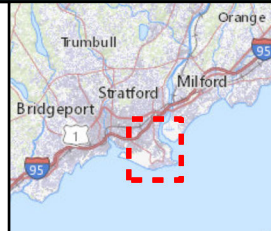


Legend

- Airport Property Boundary
- Generalized Study Area
- Town Boundary
- Resource Conservation and Recovery Act (RCRA) Site
- Superfund National Priority List (NPL) Site**
- Raymark Industries, Inc. Operable Unit #9 (Short Beach Park & Stratford Landfill)

**Figure 4-8
Superfund &
RCRA Sites**

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Short-Term Projects EA



The following criteria were applied to assess the data and determine the presence of environmental justice (EJ) populations. Affected communities (AC) that are more than 50% minority or low income are automatically designated as EJ populations. All other ACs are designated as an EJ population if the low-income or minority populations are 125% of the community of comparison (COC). In the case of this analysis, the project is wholly contained within Fairfield County, which most accurately represents the geographic, social, and economic environment of the project area. Therefore, Fairfield County was deemed the most appropriate COC. The generalized study area was determined to include Census tracts 804, 805, and 806. Figure 4-9 displays the location of each census block included in the EJ analysis. Census tracts were utilized as ACs because they allow for essential data extraction within a larger study area. A reference threshold of 125% was calculated over the COC population to establish a threshold used to assess EJ populations' presence.

The results of this analysis appear in Table 4-6. This data shows an EJ population within the study area, specifically in Census Tract 804. Census Tract 804 is designated as an EJ population because it is greater than 50% minority.

Table 4-6: Minority & Low-Income Population Analysis

	Fairfield County (COC)	Census Tract 804	Census Tract 805	Census Tract 806
Total Population	943926	6313	3029	2638
Minority Persons	361107	5148	177	1158
Percent Minority	38.3%	81.6%	5.8%	43.9%
125% COC	47.8%			
Potential Minority EJ Impact?		Yes	No	No
Low Income	926424	6295	3029	2598
Percent Low Income	8.9%	13.4%	3.7%	9.6%
125% COC	11.1%			
Potential Low Income EJ Impact?		Yes	No	No

Source: U.S. Census, 2015-2019 ACS Survey (5-year estimates).

4.13 WATER RESOURCES

In accordance with Section 14 of 1050.1F Desk Reference, water resources include Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers. The affected environment of these resources is described in the following sections.

4.13.1 Wetlands

The U.S. Army Corps of Engineers (USACE) regulates activities resulting in the disposal of dredged or fill material into waters of the United States, including wetlands, through Section 404 of the Clean Water Act (CWA). Section 10 of The Rivers and Harbors Act of 1899 (33 U.S.C. 401 et. seq.) requires authorization from USACE prior to construction of any structure over, excavation from, or disposal of materials into navigable waters. Structures or work outside the limits defined for navigable waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The State of Connecticut regulates all activities conducted in tidal, coastal, or navigable waters under the Structures, Dredging and Fill statutes (CGS) Sections 22a-359 - 22a-363h, and tidal wetlands under the tidal wetlands statutes (CGS) Sections 22a-28 - 22a-35. The Connecticut Tidal Wetland Act defines tidal wetlands as "*those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marshes, swamps, meadows, flats, or other low lands subject to tidal action, including those*

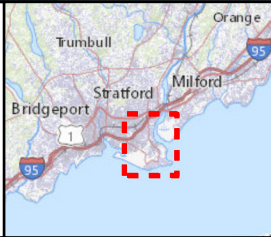


Legend

- Airport Property Boundary
- Generalized Study Area
- Detailed Study Area
- Town Boundary
- Census Tract
- Potential EJ Populations

**Figure 4-9
Census Tracts**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



0 600 1,200 2,400
Feet

Source: Surface Water Quality (CT GIS, 2020)

areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all, of a list of specific plant species provided in the Act."

Any construction activity proposed at or waterward of the Coastal Jurisdiction Line (CJL) requires authorization from CT DEEP prior to construction, including areas one foot above the CJL that have tidal vegetation. The CJL line for the detailed study area is 4.8 feet NAVD88. The High Tide Line (HTL), as defined by Section 404 of the CWA, is the federal jurisdictional boundary for waters of the U.S. The HTL means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The USACE regulates any activity waterward of the HTL.





Information regarding the presence, classification, and characterization of wetlands in the detailed study area was obtained from a combination of online data sources and field investigations. A field wetland delineation was conducted over several site visits between August and October 2021. The area of field investigation for the delineation of wetland resources included the detailed study area. All the wetlands on the site are currently subject to tidal influence and contain one or more species of tidal wetland vegetation. Thus, they are considered tidal wetlands in accordance with the State of Connecticut definition. These tidal wetlands are also regulated by the USACE.

Nine wetland systems were identified within the study area (see Figure 4-10). Most of the wetlands within the study area have been disturbed by past and present disturbances. Wetlands 1, 2, and 3 drain to the southwest. Wetlands 1 and 2 are larger tidal wetland complexes that have been disturbed by past filling and draining activities. Wetland 3 is adjacent to the mowed areas around the west end of Runway 11-29 and consists largely of constructed channels and Common Reed-dominated tidal marshes. Wetlands 4, 5, 6, 7, 8, and 9 drain east to the Housatonic River via the Marine Basin. Wetlands 4, 5, 6, 7, and 8 are within the maintained areas around the east ends of Runway 11-29 and Runway 6-24. Although Wetlands 5 and 7 are "isolated" from larger wetlands and have no surface water connection with daily tidal flooding, they are still below the CJL/HTL elevations and presumed to be regulated as tidal wetlands. Wetland 9 is located east of Stratford Road and is comprised of vegetated tidal wetlands associated with the marine basin.

The large wetland complexes that are not within the maintained areas around the runways form important habitat systems and wildlife corridors that provide resources for various fish and wildlife species known to occur in tidal marshes and tidal creeks. The tidal wetlands within the maintained areas around the runways provide limited habitat for wildlife. Several plant species listed in the State of Connecticut ESA as special concern, threatened, and endangered have been documented in portions of some of these tidal wetlands that lie within the study area. The characteristics of the wetland systems are discussed in detail in the Wetland Delineation Report (Appendix E) and summarized in Table 4-7.

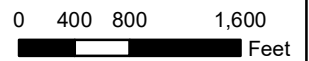
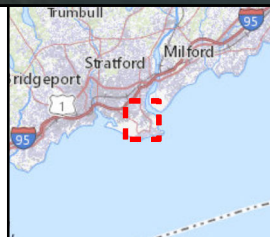


Legend

-  Airport Property Boundary
-  Town Boundary
-  Detailed Study Area
-  Delineated Tidal Wetland

**Figure 4-10
Delineated Wetlands**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



CIA

Table 4-7: Wetlands Within the Limits of Wetland Delineation Fieldwork

Wetland ID	General Description	Soil Type (drainage class)	Characteristic Vegetation
Wetland 1	Tidal marsh partially dominated by Common Reed that has been channelized/diked	Walpole sandy loam (poorly drained), Westbrook mucky peat (very poorly drained), and Aquepts (poorly drained fill materials)	Common reed (<i>Phragmites australis</i>) Smooth cordgrass (<i>Spartina alterniflora</i>) Saltmeadow cordgrass (<i>Spartina patens</i>) Sensitive fern (<i>Onoclea sensibilis</i>) Poison ivy (<i>Toxicodendron radicans</i>) Multiflora rose (<i>Rosa multiflora</i>) Groundsel tree (<i>Baccharis halimifolia</i>) Red maple (<i>Acer rubrum</i>)
Wetland 2	Tidal marsh partially dominated by Common Reed that has been channelized/diked	Walpole sandy loam (poorly drained), Westbrook mucky peat (very poorly drained), and Aquepts (poorly drained fill materials)	Common reed (<i>Phragmites australis</i>) Smooth cordgrass (<i>Spartina alterniflora</i>) Saltmeadow cordgrass (<i>Spartina patens</i>) Multiflora rose (<i>Rosa multiflora</i>) Groundsel tree (<i>Baccharis halimifolia</i>)
Wetland 3	Tidal marsh partially dominated by Common Reed including excavated channels	Scarborough muck and Aquepts (poorly and very poorly drained fill materials)	Common reed (<i>Phragmites australis</i>) Smooth cordgrass (<i>Spartina alterniflora</i>) Saltmeadow cordgrass (<i>Spartina patens</i>) Seaside goldenrod (<i>Solidago sempervirens</i>) Switchgrass (<i>Panicum virgatum</i>) Slimspike three-awn (<i>Aristida longespica</i>) Groundsel tree (<i>Baccharis halimifolia</i>)
Wetland 4	Common Reed-dominated recently excavated channel within the mowed areas adjacent to the runway	Aquepts (poorly drained fill materials)	Common reed (<i>Phragmites australis</i>) Broadleaf cattail (<i>Typha latifolia</i>) Purple loosestrife (<i>Lythrum salicaria</i>) Soft rush (<i>Juncus effusus</i>) Straw colored flatsedge (<i>Cyperus strigosus</i>) Curley dock (<i>Rumex crispus</i>) Groundsel tree (<i>Baccharis halimifolia</i>)
Wetland 5	Mowed tidal wetland vegetation adjacent to the south side of the east end of Runway 11-29	Aquepts (poorly drained fill materials)	Soft rush (<i>Juncus effusus</i>) Straw colored flatsedge (<i>Cyperus strigosus</i>) Black needlegrass (<i>Juncus gerardi</i>) Bearded sprangletop (<i>Leptochloa fusca</i>)
Wetland 6	Common Reed-dominated tidal wetland	Walpole sandy loam (poorly drained) and Aquepts (poorly drained fill materials)	Common reed (<i>Phragmites australis</i>) Jewelweed (<i>Impatiens capensis</i>) Grass-leaved goldenrod (<i>Euthamia graminifolia</i>) Spotted Joe-pyeweed (<i>Eutrochium maculatum</i>) Deer-tongue grass (<i>Dichanthelium clandestinum</i>) Elderberry (<i>Sambucus nigra</i>)

Wetland ID	General Description	Soil Type (drainage class)	Characteristic Vegetation
Wetland 7	Mowed tidal wetland vegetation adjacent to the south side of the east end of Runway 11-29	Aquents (poorly drained fill materials)	Soft rush (<i>Juncus effusus</i>) Straw-colored flatsedge (<i>Cyperus strigosus</i>) Black needlegrass (<i>Juncus gerardii</i>) Slimspike three-awn (<i>Aristida longespica</i>)
Wetland 8	Partially mowed tidal wetland and excavated tidal creek adjacent to the north side of the east end of Runway 11-29	Aquents (poorly drained fill materials)	Smooth cordgrass (<i>Spartina alterniflora</i>) Saltmeadow cordgrass (<i>Spartina patens</i>) Saltgrass (<i>Distichlis spicata</i>) Black needlegrass (<i>Juncus gerardii</i>) Glasswort (<i>Salicornia sp.</i>) Smooth orache (<i>Atriplex glabriuscula</i>) Marsh elder (<i>Iva frutescens</i>) Groundsel tree (<i>Baccharis halimifolia</i>)
Wetland 9	Narrow area of tidal vegetation adjacent to the south side of Marine Basin and a tidal channel	Aquents (poorly drained fill materials)	Smooth cordgrass (<i>Spartina alterniflora</i>) Saltmeadow cordgrass (<i>Spartina patens</i>) Switchgrass (<i>Panicum virgatum</i>) Common reed (<i>Phragmites australis</i>) Seaside goldenrod (<i>Solidago sempervirens</i>) Multiflora rose (<i>Rosa multiflora</i>) Groundsel tree (<i>Baccharis halimifolia</i>) Marsh elder (<i>Iva frutescens</i>) Red maple (<i>Acer rubrum</i>)

Source: FHI Studio 2021.

4.13.2 Floodplains

EO 11988 defines floodplains as the "lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands, including at a minimum, the area subject to a one percent or greater chance of flooding in a given year." The intent of Order 11988 is to ensure that floodplains and floodways are kept clear of obstructions and facilities that could restrict or increase flow rates or volumes during flood conditions. Encroachment is defined as any action that would cause the 100-year water surface profile to rise by one foot or more. The 100-year floodplain has been adopted by FEMA as the base flood for floodplain management. Both federal and state laws regulate development within floodplains and floodways.

According to FEMA's Flood Insurance Rate Maps dated June 10, 2019, most of the airport's property is within the FEMA designated 100-year floodplain. The areas of the airport that are not within the 100-year floodplain are within the 500-year floodplain (see Figure 4-11). Therefore, any proposed projects at BDR would be within a FEMA designated floodplain, and compliance with applicable state and federal flood and stormwater management standards must be demonstrated, including adherence to section 25-68d of the Connecticut General Statutes.

4.13.3 Surface Water

The airport is located at the junction of the Housatonic River and Long Island Sound. Surface water resources on and in the immediate vicinity of BDR include a network of ditches, unnamed tidal streams,

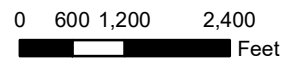
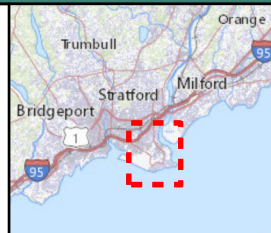


Legend

- Airport Property Boundary
 - Generalized Study Area
 - Detailed Study Area
 - Town Boundary
 - FEMA 100-Year Floodplain
- Surface Water Quality**
- A
 - B, B*
 - SA
 - SB

**Figure 4-11
Water Resources**

Igor I. Sikorsky Memorial Airport
Short-Term Projects EA



Source: Surface Water Quality (CT GIS, 2020),
Floodplain (FEMA, 2020)



and wetlands that ultimately drain to Long Island Sound. Frash Pond is a tidally influenced waterbody located north of BDR. The Great Meadows Marsh complex is located west of the airport (see Figure 4-11).

Water quality classifications have been assigned to all surface and ground waters throughout Connecticut to establish uses while also identifying the criteria necessary to support those uses. There are three classes for inland surface waters (AA, A, and B) and two classes for coastal/marine surface waters (SA and SB).

Surface water features on, and adjacent to, BDR have either an inland surface water classification of "A" or a coastal and marine surface water classification of "SB" (CT DEEP, 2018). Surface waters with the classification "A" are uniformly good to excellent, with natural quality. They have the potential to be used for public water supply. Other designated uses for class "A" waters include fishing, swimming and recreation, healthy marine habitat, direct shellfish consumption, and industrial supply. Coastal surface waters with a classification of "SB" are of uniformly good quality with designated uses, including fishing, swimming and recreation, healthy marine habitat, commercial shellfish harvesting (requires purification), and industrial supply. The man-made ditches around the airport runways are classified as "A." Frash Pond and other smaller pockets of surface water surrounding the airport are also classified as "A." The tidally influenced creeks and open water areas in the southwest portion of BDR are classified as "SB." The open water areas to the west of the airport in the Great Meadows marsh complex are also classified as "SB," as are the Housatonic River and Marine Basin to the east of BDR. Long Island Sound is classified as "SA."

According to the 2020 State of Connecticut Integrated Water Quality Report (DEEP, April 2020), the water bodies classified as "A" on, and adjacent to, BDR were not assessed. The "SB" classified water bodies on, and adjacent to, the east side of the airport that are associated with Marine Basin were assessed as impaired and not supporting aquatic life and shellfish consumption. The "SB" classified water bodies on, and adjacent to, the west side of BDR that are associated with Great Meadows marsh were assessed as impaired and not supporting marine aquatic life, recreation, and shellfish.

4.13.4 Groundwater

Based on a review of the EPA Sole Source Aquifers online GIS (EPA, 2021), the airport is not in a sole source aquifer. BDR is also not located within a Connecticut Aquifer Protection Area (CT DEEP, 2021). Groundwater beneath the airport is classified by CT DEEP as "GB" (CT DEEP, 2021). Class GB designated uses are industrial process water and cooling waters, baseflow for hydraulically connected surface water bodies, and presumed unsuitable for human consumption without treatment.

4.13.5 Wild and Scenic Rivers

The Wild and Scenic Rivers Act (PL 90-542, as amended) was implemented to facilitate the protection of rivers possessing "*outstandingly remarkable scenic, recreational, geological, fish and wildlife, historic, cultural, or any other similar values.*" According to data from the Nationwide Rivers Inventory, there are no federally designated Wild and Scenic Rivers within the detailed study area.

5 ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences resulting from the proposed safety improvements to Runway 11-29 at BDR with respect to the environmental resource categories, characterized in Chapter 4, as specified in FAA Order 1050.1F: *Environmental Impacts: Policies and Procedures*. The information in this chapter compares the Sponsor's Proposed Action and the No-Action Alternative in the same analysis year (2026, the year the project construction would be complete) for each environmental resource category to determine the long-term effect (beneficial or adverse) of the Sponsor's Proposed Action. Measures proposed to avoid, reduce, and/or mitigate the potential impacts are identified with each resource category, as applicable.

It was determined that the Wild & Scenic Rivers resource categories would not be affected by the proposed development at BDR as they do not currently exist within the study area. Therefore, no further impact analyses were conducted.

5.1 AIR QUALITY

The airport is in Fairfield County, Connecticut, which is a part of the New Jersey-New York-Connecticut Interstate Air Quality Control Region (40 CFR 81, Subpart B, §81.13). According to the EPA, Fairfield County is currently designated as a non-attainment area for the 2008 and 2015 ozone standards. Fairfield County is designated as a maintenance area for CO and PM_{2.5}. Fairfield County is designated as an attainment area for all other criteria pollutants.

Two primary regulations apply to air quality: NEPA and the CAA. The need for an air quality assessment to satisfy NEPA depends on the nature of the project, the project area's non-attainment status, and the size of the airport. The CAA amendments of 1990 include provisions to ensure emissions from federally funded actions within non-attainment areas comply with the goals and objectives of the State Implementation Plans (SIP) for the state the project is located.

5.1.1 Significance Threshold

As provided in FAA Order 1050.1F, an action would cause significant air quality impacts if pollutant concentrations were to exceed one or more of the NAAQS, as established by the EPA under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations. Additionally, while not a significance threshold for NEPA, the EPA promulgated the General Conformity Rule in 1993 to implement the conformity provision of Title I, §176the (1) of the CAA Amendments of 1990.

NAAQS Evaluation

The impact of a proposed action on air quality must be assessed by evaluating the impact of the proposed action to the NAAQS. The NAAQS are pollutant concentrations established to define maximum levels of pollutants in the ambient air over a period. Direct comparison of project emissions to the NAAQS requires dispersion modeling. Modeling the wide array of sources at an airport is a significant effort and is typically only required for actions that will significantly affect aircraft operations in a non-attainment or maintenance area. In lieu of modeling, an emissions inventory is used to quantify the amounts of criteria pollutant emissions associated with operational activity in the proposed project/action. The results are typically expressed in tons/year segregated by pollutant type, emission source (e.g., aircraft engines,

Auxiliary Power Units, Ground Service Equipment), and alternative. The results of the inventory provide a measure of the magnitude of the potential air quality impacts and enable useful comparisons of emissions between project alternatives.

General Conformity

The CAA establishes regulations that apply to federally funded projects. These rules and regulations are intended to prevent the Federal Government from approving or funding a project that will not comply with the SIP. SIP(s) are developed to ensure that federal air quality standards will be met and maintained through the states. The rules established in the CAA, specifically the General Conformity Rule, apply to airport improvement projects when an airport is within a non-attainment or maintenance area for any of the criteria pollutants.

General Conformity refers to the specific requirements under Section 176(c) of the CAA for federal agencies other than the Federal Highway Administration and the Federal Transit Administration. Applicability of the General Conformity Rule is dependent on whether emissions will affect attainment as set forth in the SIP. The threshold levels, or *de minimis* levels, for each criteria pollutant are established under the CAA to determine if a proposed action could affect attainment status. Table 5-1 depicts the *de minimis* thresholds for each criteria pollutant. The *de minimis* thresholds for which Fairfield County is classified as non-attainment or a maintenance area are highlighted.

Table 5-1: *De Minimis* Thresholds

Pollutants	<i>De Minimis</i> Levels	
	Non-Attainment	Maintenance
	(tons per year)	(tons per year)
Carbon Monoxide (CO)	100	100
Particulate Matter (PM ₁₀)		
Moderate Non-Attainment	100	100
Serious Non-Attainment	70	
Particulate Matter (PM _{2.5})	100	100
Sulfur Dioxide (SO ₂)	100	100
Nitrogen Oxide (NO ₂)	100	100
Ozone (O ₃)	(VOC/NO _x)	
Serious Non-Attainment Area	50/50	50/100
Severe Non-Attainment Area	25/25	
Extreme Non-Attainment Area	10/10	
<u>Inside Ozone Transport Region</u>		
Marginal Non-Attainment	50/100	
Moderate Non-Attainment	50/100	
<u>Outside Ozone Transport Region</u>		
Marginal Non-Attainment Area	100/100	100/100
Moderate Non-Attainment Area	100/100	
Lead (Pb)	25	25

Source: 40 CFR Part 51.850; Part 81, Subpart B §81.37 and Subpart C, §81.323.

5.1.2 Alternative 5A: Sponsor’s Proposed Action

Development of the Sponsor’s Proposed Action would shift Runway 11-29 to the west 150 feet and install EMAS on both ends of the runway. The Sponsor’s Proposed Action would not result in any changes to the number or size of aircraft operating at BDR. Aircraft operations on Runway 11-29 would occur

approximately 150 feet further to the west, shifting aircraft taxi routes by a similar amount. The runway relocation and increased taxi distance for arrivals or departures from Runway 11-29 would result in a negligible change to aircraft emissions. Thus, the operation of the Sponsor's Proposed Action would not have significant impacts on air quality when compared to the No-Action Alternative, and an operational emissions inventory is not required. Temporary air quality impacts may occur during construction. A construction emissions inventory was prepared to estimate the potential for air quality impacts during construction.

5.1.3 Alternative 6: No-Action Alternative

Under the No-Action Alternative, no change in airport operations would occur compared with existing conditions. Therefore, no impacts from the No-Action Alternative would occur.

5.1.4 Construction Emissions Inventory

The Airport Construction Emissions Inventory Tool was used to estimate construction emissions (see Appendix F). The construction emission inventory was prepared for emissions of CO, PM10/2.5, SO₂, NO_x, Volatile Organic Compound (VOC), and CO₂ (see Table 5-2).

Table 5-2: Construction Emissions Inventory

Pollutant	Tons/Year
Carbon Monoxide (CO)	8.4
Particulate Matter (PM10)	0.5
Particulate Matter (PM2.5)	0.1
Sulfur Dioxide (SO ₂)	0.02
Nitrogen Oxides (NO _x)	1.9
Volatile Organic Compounds (VOC)	7.0
Carbon Dioxide (CO ₂)	2,410

Source: CHA, 2021.

5.1.5 General Conformity Applicability

As previously stated, if project-related emissions exceed the CAA *de minimis* thresholds, a formal Conformity Determination is required to demonstrate that the project conforms to the applicable SIP. However, if project-related emissions are below *de minimis* thresholds, the project is assumed to conform to the SIP. The emission estimates of NO_x, VOC, CO, and PM_{2.5} presented in Table 5-2 demonstrate that emissions during the construction period would not exceed the *de minimis* thresholds. As such, the SIP conformity requirements of the CAA are not applicable to the Sponsor's Proposed Action.

5.2 BIOLOGICAL RESOURCES

Section (c) of the ESA of 1973 (16 USC 1531 et seq.) requires that the potential impacts on rare, threatened, and endangered species of flora and fauna and their critical habitats be identified to avoid adverse impacts on these species. Federally listed species include those designated as threatened, endangered, or candidate species by the USFWS. Impacts on state-listed animals or plants or significant natural communities must also be assessed. As discussed in Chapter 4, the USFWS IPaC tool and the CT DEEP were used to determine the type of species that may be found in the study area. FAA Order 1050.1F provides guidance on evaluating potential environmental impacts on biological resources, which include:

- Long-term or permanent loss of unlisted plant or wildlife species
- Adverse impacts on special status species (state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance

5.2.1 Significance Threshold

According to FAA Order 1050.1F Desk Reference (v2), a significant impact on biological resources would occur when "*The U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would result in the destruction or adverse modification of federally designated critical habitat.*" The FAA does not have a significant threshold for non-listed species.

5.2.2 Alternative 5A: Sponsor's Proposed Action

Ecological Communities

Alternative 5A would permanently impact approximately 2.1 acres of an anthropogenic coastal grassland community, and approximately 18.3 acres would be temporarily impacted from grading activities. Permanent impacts would occur in areas where this community type is converted to paved areas or where the EMAS system is installed. The temporary impacts would include areas where grading occurs within the RSA. These areas would be re-vegetated and subject to the existing maintenance regime. This alternative would have a beneficial impact on this community type through the net removal of approximately 6.3 acres of old pavement and conversion of these areas to maintained grassland.

Wildlife

Although BDR provides habitat for many wildlife species, active wildlife habitat is not compatible with airport operations. Wildlife habitat is generally minimized where possible to reduce the potential for wildlife strikes on operating aircraft. There is a particular emphasis on wildlife habitat that serves as an attractant to large mammals such as white-tailed deer, flocking bird species such as starlings and swallows, and species of waterfowl and shorebirds.

Alternative 5A would alter the vegetative characteristics of habitat areas within the proposed RSA and have permanent impacts on potential wildlife habitats, specifically wetlands. This reduction of wetland habitat within the RSA would have a corresponding reduction in the presence of potentially hazardous wildlife near the active runway and therefore reduce the potential for wildlife strikes. Although maintained lawn habitat would experience a net increase under this alternative, this habitat type does not serve as an attractant for potentially hazardous wildlife and is not anticipated to increase wildlife presence on the airfield. Although some habitat would be lost, this is not expected to affect local or regional populations of wildlife species. Mammals on the airport are typically generalists and are mobile and adaptable to shifts in habitat. As a result, no adverse impacts are anticipated on local or regional populations of mammals.

The wetlands within the study area provide a feeding habitat for some avian species such as wading birds and shorebirds. The loss of wetlands associated with Alternative 5A, which is discussed in detail in Section

5.15.1, is not anticipated to adversely impact such avian species since ample feeding habitat exists within the local and regional area.

Federally Listed Species

Under Section 7 of the ESA, FAA may make the following findings regarding effects to federally threatened or endangered terrestrial or aquatic species:

- No effect – when an action would not affect a listed species or designated critical habitat
- May affect – when an action may pose an effect on listed species or designated critical habitat
- Not likely to adversely affect – when effects on listed species are expected to be discountable, insignificant, or completely beneficial
- Likely to adversely affect – when an adverse effect on listed species may occur as a direct or indirect result of the action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial

If the FAA determines that an action may affect a threatened or endangered species, the FAA must initiate a consultation with the USFWS (for terrestrial and freshwater species) or NOAA NMFS (for marine and anadromous species) to ensure that the action is not likely to jeopardize the continued existence of any federally listed threatened or endangered species or result in the destruction or adverse modification of critical habitat. The following is a list of terrestrial species potentially impacted by Alternative 5A:

- Northern Long-eared Bat: An effects determination for the Northern Long-eared Bat was submitted to the USFWS through the IPaC system on January 17, 2022 (see Appendix B). The USFWS response indicated that the Sponsor's Proposed Action is consistent with the activities analyzed in the USFWS's January 5, 2016, Programmatic Biological Opinion. Although Alternative 5A may affect the Northern Long-eared Bat, any take that may occur is not prohibited under the ESA Section 4(d) rule adopted for this species under 50 CFR §17.40(o).
- Roseate Tern: Alternative 5A would not affect the Roseate Tern since this seabird does not nest within or utilize areas within the detailed study area. This species may occur solely for feeding on nearshore "baitfish." However, this habitat is outside the detailed study area for Alternative 5A.
- Red Knot: This shorebird does not nest within or adjacent to the detailed study area, nor does suitable feeding habitat exist. The study area is far enough from suitable habitat that construction activity associated with Alternative 5A would not disturb foraging or roosting Red Knots.
- Monarch Butterfly: The Monarch Butterfly has recently become a candidate for listing under the ESA. During breeding and migration, adult Monarch Butterflies occur in various habitats with blooming nectar resources that they feed on, and they require milkweed host plants (primarily *Asclepias spp.*) for reproduction. Monarch Butterflies use various roosting trees during the fall migration (USFWS, 2020). Developed and mowed areas in the detailed study area do not provide habitat for this species. Removing invasive species and some tree and shrub species during construction could benefit the Monarch Butterfly by promoting a suitable herbaceous habitat.

Based on results from NOAA's Section 7 Mapper, the only waterway within the study area where aquatic species occur is in the Marine Basin, which is east of Stratford Road (Route 113). According to the Sea Turtle Sightings Hotline for Southern New England Boaters (2021), there have been no sightings of sea turtles in the Marine Basin, Housatonic River, or Lewis Gut. Due to the presence of a tide gate on the

eastern end of the project area at the Marine Basin/Housatonic River, it is not expected that any sea turtles or sturgeon individuals would occur in these tidal channels or wetland areas. Based on information from the CT DEEP⁵, Shortnose Sturgeon does not reproduce in the Long Island Sound or the Housatonic River, and adult individuals are only occasional visitors to the Housatonic River. Similarly, Atlantic Sturgeon are thought to no longer reproduce in any Connecticut waters, with only the occasional stray individual using Connecticut estuaries⁶. Neither sturgeon species are expected to occur within any portion of the project area. As part of EFH conservation measures, Time of Year (TOY) restrictions on in-water work would likely be required to reduce the potential exposure of fishery resources to turbidity and/or noise; these same TOY work restrictions and other conservation measures relating to in-water work would protect sturgeon individuals, if present.

In conclusion, Alternative 5A would have no effect on federally listed terrestrial or aquatic species or critical habitat.

State-listed Species - Avian and Herpetofauna

Minimal temporary and minor permanent impacts are expected on listed avian species within the project area during and after the construction associated with Alternative 5A for the following reasons:

- The proposed construction activity is planned for existing developed portions of the airport (e.g., existing runway footprints) or intensely managed or ruderal habitats (e.g., lawns and artificial fill areas) in both upland and wetland settings that are sparsely vegetated or vegetated with non-native and invasive plant species, with the sole exception of Wetland 8. These site areas have little habitat value to listed avian species compared to other areas of airport property.
- Alternative 5A would result in a net reduction of approximately 6.3 acres of impervious surface, thereby creating a net increase of open, vegetated land cover.
- Alternative 5A would impact approximately 2.1 acres of tidal wetland habitat; about 0.8 acres are “infield” tidal wetlands with low habitat value. Although approximately 1.3 acres of Wetland 8 would be impacted and Wetland 8 is of higher value for avian species, large areas of high-quality wetlands would still be available in the overall estuarine area for use by these species. The proposed impacts on wetlands would be compensated for by mitigation activities developed through coordination with the regulatory agencies.
- Most of the breeding listed avifaunal species were found by previous studies to occur inside existing, high value tidally influenced salt marsh habitats dominated by native flora. Other than Wetland 8, these areas lie outside the proposed impact zones.
- The limited potential temporary impacts on breeding species found to be nesting proximal to work areas (e.g., Savanna Sparrow documented in a previous survey) would be avoided by construction sequencing/phasing.

Potential impacts on the Diamondback Terrapin are expected to be minimal for Alternative 5A. Although this species has been observed within the site at the Runway 11 end, there are no direct impacts on tidal creeks where this species may hibernate or feed. This species uses sandy areas adjacent to tidal creeks for nesting. Some potential nesting habitats may occur at the Runway 11 end in several small sandy areas near an existing tidal creek. These sandy areas may be re-graded under Alternative 5A, so there is the

⁵ (<https://portal.ct.gov/DEEP/Fishing/Freshwater/Freshwater-Fishes-of-Connecticut/Shortnose-Sturgeon> accessed 1/21/22)

⁶ (<https://portal.ct.gov/DEEP/Fishing/Freshwater/Freshwater-Fishes-of-Connecticut/Atlantic-Sturgeon> accessed 1/21/22)

potential for impacts on nesting habitat for this species; however, no nesting of this species has been confirmed in the project area.

State-listed Species - Plants

As discussed in Section 4.5, five different state-listed plant species were observed and documented within the detailed study area. They were found within both wetland areas and the anthropogenic coastal grassland habitats. Of these, four listed plant species would be impacted by the proposed work under Alternative 5A (see Table 5-3 and Figure 5-1). Several state-listed plant species would be avoided by the proposed work and would not be impacted by Alternative 5A, including Eastern prickly pear cactus (*Opuntia humifusa*) and one of two varieties of Needlegrass within the project area (*Aristida longespica* var. *geniculate*).

Table 5-3: State-listed Plant Species Potentially Impacted by Alternative 5A

Species	State Status	Potential Impacts
Saltpond grass (<i>Leptochloa fusca</i> ssp. <i>fascicularis</i>)	Endangered	Impacts due to grading within Wetland 5 and several other small populations within the RSA at the Runway 29 end. All populations would be permanently impacted.
Field Beadgrass (<i>Paspalum conjugatum</i>)	Threatened	Impacts due to grading within Wetland 3 and several other small populations within the RSA at the Runway 11 end. Most populations would remain intact and would not be impacted.
Needlegrass (<i>Aristida longespica</i> var. <i>longespica</i>)	Special Concern	Impacts due to grading primarily in the Runway 11 end but also in several other small populations throughout the Runway 11-29 improvement areas. Large areas of this species' populations would be impacted. The Needlegrass variety (<i>Aristida longespica</i> var. <i>geniculate</i>) would not be impacted by Alternative 5A.
Beach Orache (<i>Atriplex glabriuscula</i>)	Special Concern	Impacts due to grading within Wetland 8 within the RSA at the Runway 29 end. All individuals of this species within the project area would be permanently impacted.

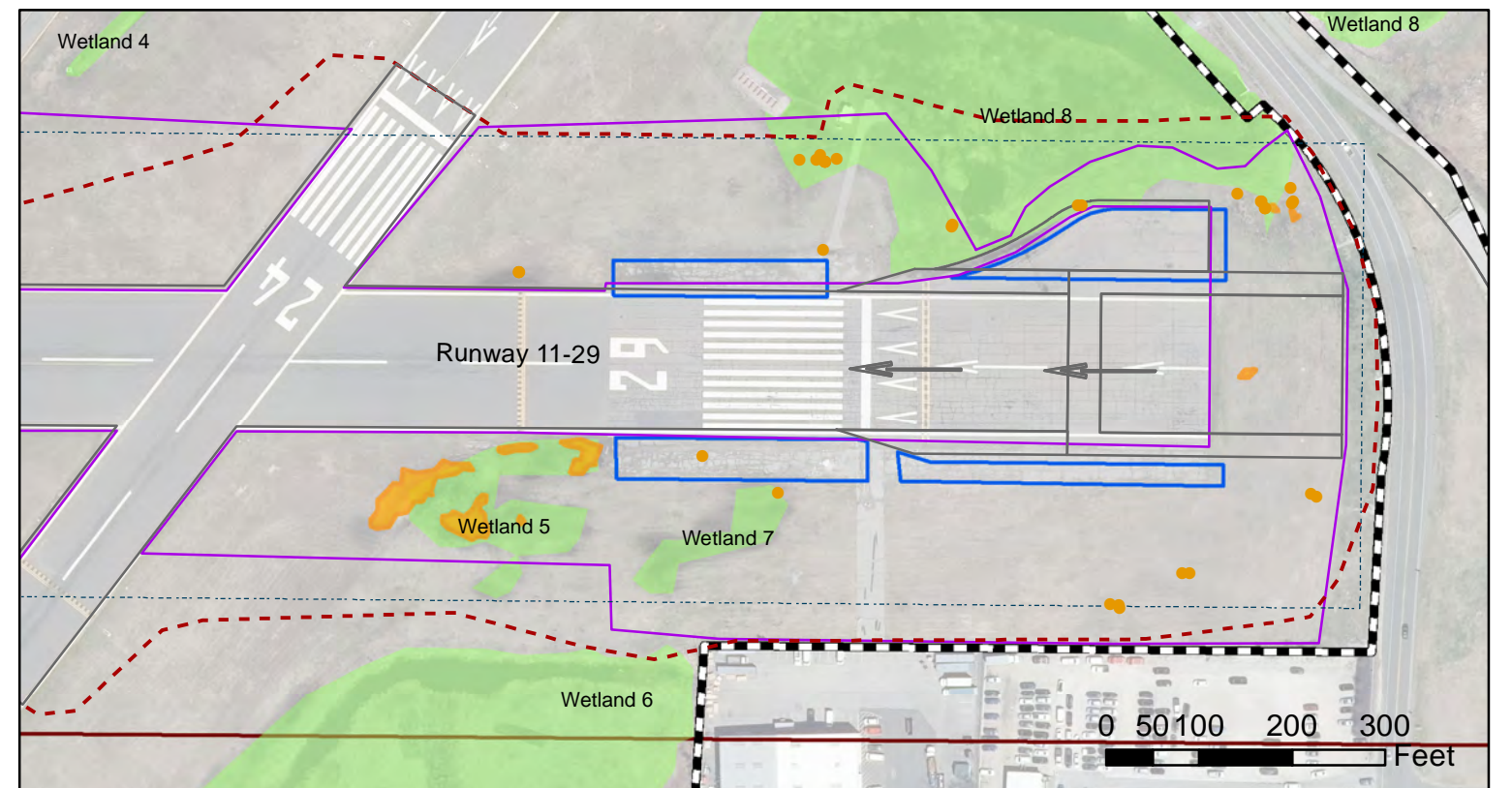
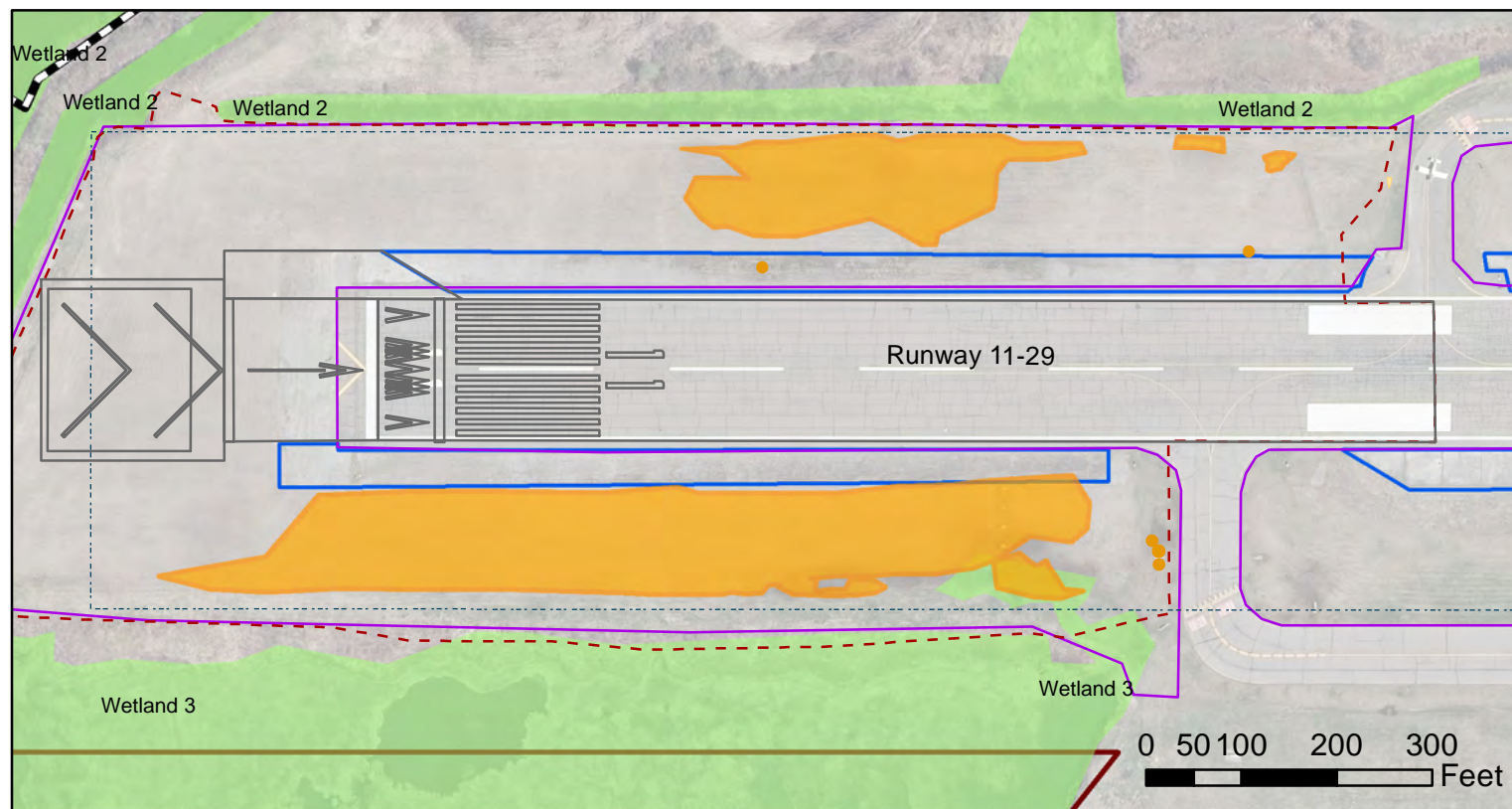
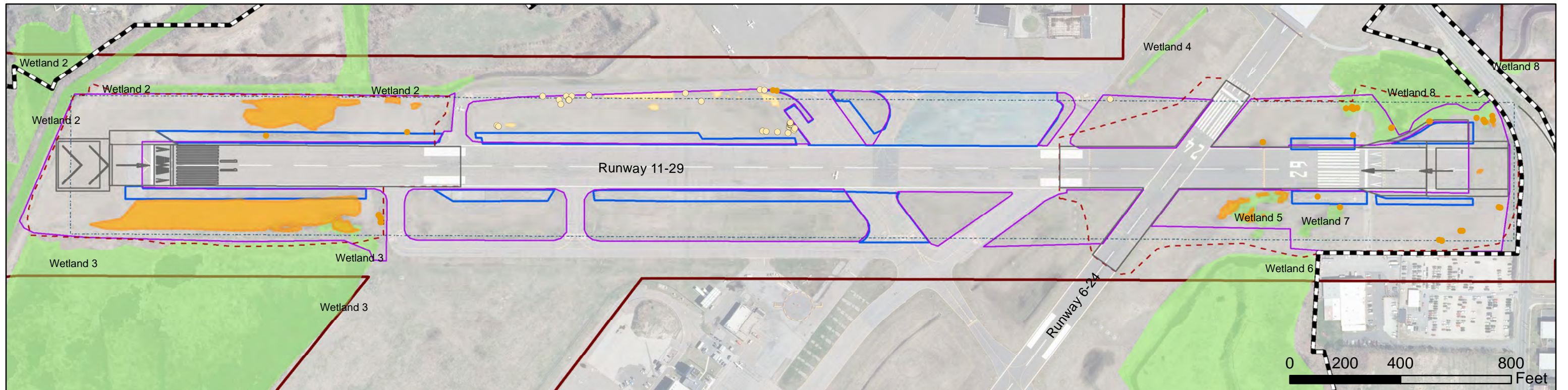
Source: FHI Studio, 2021.

State-listed Species - Invertebrates

Since three individual Mudflat Tiger Beetles (*Cicindela marginata*) were documented on the Runway 11 end of the project in 2012, this species may occur within or adjacent to the proposed work area. Much of the RSA on the Runway 11 end is well-drained, and it is unlikely this species would utilize this area to any substantial degree. However, the potential still exists based on the 2021 findings. Additional coordination with CT DEEP would be undertaken during permitting.

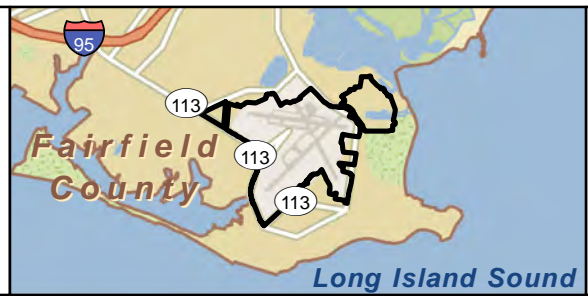
Migratory Birds

No adverse impacts on the migratory avian species identified by the USFWS are anticipated. Like the state-listed avian species, the habitats proposed to be impacted under Alternative 5A are generally unsuitable for the identified species, except for Wetland 8. These site areas have little habitat value to migratory species compared to other areas of airport property. Several migratory avian species identified by the USFWS might utilize Wetland 8 for feeding. Although approximately 1.3 acres of Wetland 8 would be impacted, large areas of contiguous high-quality wetlands would still be available in the overall estuarine area for use by migratory species. The proposed impacts on wetlands would be compensated for by



- Study Area
- Airport Property Boundary
- Tidal Wetland Area (Estimated)
- State Listed Plant Impacts
- Runway Safety Area (RSA)
- Limit of Grading Disturbance
- Limit of Investigation
- Existing Pavement Removal
- State Listed Plants Not Impacted

**Sponsor's Proposed Action
Igor I. Sikorsky Memorial Airport**



**Figure 5-1
State Listed Plant Impacts
Resulting From RSA
Improvements**

Sources: Imagery (esri/State of CT., 2019), CHA, FHI Studio 2022

mitigation activities developed through coordination with the regulatory agencies. This alternative would also result in a net reduction of approximately 6.3 acres of impervious surface, thereby creating a net increase of open, vegetated land cover.

Essential Fish Habitat

Aquatic habitats within the tidal marshes provide potential spawning, nursery, and feeding grounds for various fish species and are designated as EFH. Within the detailed study area, this habitat type is limited to Wetland 8, as it is directly connected to the marine basin and subject to daily tidal action. A tide gate was installed on the east side of Route 113 as part of the Runway 6-24 project in 2015. Although the presence of a tide gate downstream of a wetland would normally eliminate the area as EFH, this tide gate was designed and constructed with an open orifice that allows a certain amount of incoming tide to flow through the tide gate and into Wetland 8. Despite this connectivity, the habitat within Wetland 8 is not ideal for EFH above the tide gate as it is clearly diminished/limited. No other in-water work is proposed as part of the project activities; therefore, impacts on EFH are not likely. All other impacted tidal wetlands are located “infield” and are well above the MHW elevation and not subject to daily tidal action. As a result, they do not provide habitat for fish species.

Based on early coordination, NOAA has indicated concern with potential impacts on tidal wetlands and EFH for the winter flounder (*Pseudopleuronectes americanus*). Wetland 8, as described in the Wetland Delineation report and depicted on the attached figure, is a natural spartina-dominated wetland system. A tide gate was installed on the east side of Route 113 as part of the Runway 6-24 project in 2015. Although the presence of a tide gate downstream of a wetland would normally eliminate the area as EFH, this tide gate was designed and constructed with an open orifice which does allow a certain amount of incoming tide to flow through the tide gate and into Wetland 8. The habitat within Wetland 8 is not ideal for EFH above the tide gate as it is clearly diminished/limited due to the tide gate. As currently designed, about half of this spartina wetland would be impacted by the proposed project (approximately 1.3 acres). To avoid and reduce any potential impact on EFH, no in-water work will be conducted from February 1 to May 31 to avoid adverse impacts on winter flounder spawning and/or juvenile development. The FAA determined the project will have no adverse effect via correspondence with NOAA, dated February 11, 2022.

The Sponsor’s Proposed Action will not have a substantial adverse effect on EFH. Any adverse effect that may occur will be minimal, alleviated using conservation recommendations, and mitigated through the compensatory mitigation for tidal wetlands.

5.2.3 Alternative 6: No-Action Alternative

The No-Build Alternative would have no impact on biological resources. Since no work is proposed under this alternative, regular maintenance activities would continue. These maintenance activities would continue to help support the coastal grassland community, which provides suitable habitat for many of the existing listed species on the site.

5.2.4 Mitigation Measures

Coordination with USFWS and NOAA would continue into the final design and permitting phase of the project. To minimize the potential for impacts on the Northern Long-Eared Bat, tree removal will be undertaken outside of the active season (April 1 through October 31). No mitigation is anticipated to be required for the Red Knot or Roseate Tern.

Potential conservation measures to minimize impacts on EFH and listed aquatic species would include TOY restrictions for in-water work, specifically between February 1 and May 31, to avoid adverse impacts on winter flounder spawning and juvenile development. Any wetland mitigation proposed for the project should consider potential aquatic species impacts and integrate those functions and values as needed.

Coordination with CT DEEP will continue through the final design. Additional surveys for state-listed plant species will be undertaken, as necessary. A Plant Protection Plan will be prepared and submitted to CT DEEP during the permitting phase to minimize impacts on state-listed plant species. In addition, a Plan of Conservation and Protection will be prepared to ensure the safety of state-listed animal species before, during, and after construction.

Coordination with CT DEEP will be undertaken relative to the Mudflat Tiger Beetle as the design advances and potential impacts can be more precisely determined. Potential conservation measures and BMPs will be developed at that time to address potential impacts; however, it is anticipated that TOY restrictions or exclusionary areas may be needed. In a similar fashion, TOY restrictions or exclusionary areas may be needed to protect specific listed avian species within the project area (i.e., Savannah Sparrow). Impacts on high-value avian wetland habitat would be considered in developing any wetland mitigation proposed during the permitting phase of the project.

5.3 CLIMATE

Although there are no federal standards for aviation-related greenhouse gas (GHG) emissions, it is well-established that GHG emissions can affect climate. The CEQ has indicated that climate should be considered in NEPA analyses. As per the 1050.1F Desk Reference, the CEQ has noted, *“it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions; as such direct linkage is difficult to isolate and to understand.”*

5.3.1 Significance Threshold

FAA Order 1050.1F Desk Reference guidance states that a discussion of the potential climate impacts is documented in a NEPA document. Any projected GHG emissions associated with proposed actions can be used to assess a proposed action’s climate change effects. Climate change results from the addition of GHG emissions from millions of individual sources. As such, the FAA has not established a significance threshold for climate and GHG emissions.

5.3.2 Greenhouse Gas Emissions

A limited greenhouse gas inventory was prepared for airport operations. The GHG emissions associated with the operation of the airport are presented in Table 5-4. GHG emissions are presented in metric tons of CO₂ equivalent (CO₂e). The estimated GHG emissions from the construction of Alternative 5A shown in Table 5-2 are equivalent to 2,186 metric tons. Emissions of CO₂e would increase due to construction activities during the years 2023-2025. However, this would only be for the short term, and the projects would have no long-term impacts on CO₂e emissions. Because the Sponsor’s Proposed Action represents such a small amount of U.S. GHG emissions and given the related uncertainties involving the assessment of such emissions regionally and globally, the incremental contribution of Alternative 5A to U.S. and global GHG emissions cannot be adequately assessed given the current state of the science and assessment

methodology. As previously stated, there are no standards by which the emissions of GHG can be evaluated. Therefore, the estimates are provided for informative purposes only.

Table 5-4: Airport Greenhouse Gas Emission Inventory

Source Category	MT/Year
Aircraft	11,688
Ground Support Equipment	272
Ground Access Vehicles	4,113
Stationary Sources	366
Electricity Use	481
Total	16,920

5.4 COASTAL RESOURCES

Each federal agency activity within or outside of the coastal zone that affects any land or water use or natural resource of the coastal zone must be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of approved state management programs, in accordance with Sec. 307(c)(1)(A) of the federal Coastal Zone Management Act of 1972, as amended.

Federal agencies must submit a Consistency Determination, documenting that their proposed activities are consistent with the Connecticut Coastal Management Act (CCMA). Following review, the DEEP Land and Water Resources Division (LWRD) will either issue a Consistency Concurrence, stating LWRD's "concurrence" with the applicant's determination of consistency and any conditions necessary to ensure coastal consistency, or an Objection explaining why the proposal is inconsistent with the CCMA, and what additional action(s) the applicant may take to ensure coastal consistency.

The U.S. Congress recognized the importance of meeting the challenge of continued growth in the coastal zone by passing the CZMA in 1972. This act, administered by NOAA, provides for the management of the nation's coastal resources, including the Great Lakes. The goal of the Act is to "*preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone.*"

5.4.1 Significance Threshold

There is no FAA threshold of significance when impacting a coastal resource; however, the agency does adhere to the regulations in Title 15 CFR 930: *Federal Consistency with Approved Coastal Management Programs*. Pursuant to this regulation, any federal action is subject to the CZMA consistency requirements if the action will impact a coastal zone. All federal agency activities, including development projects, affecting any coastal use or resource in Connecticut must be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of Connecticut's approved coastal management program (15 CFR 930.30 through 930.46). These enforceable policies are contained in the CCMA, codified in the CGS at Sections 22a-90 through 22a-112, as amended, and compiled in the Reference Guide to Coastal Policies and Definitions ("Reference Guide" - DEEP, 1999).

A separate consistency review is required for those federal activities, including development projects, that have a reasonably foreseeable effect on any coastal use or resource and that are not otherwise directly regulated by the CT DEEP. As the proposed project includes potential impacts on tidal wetlands regulated by the CT DEEP, a Permit Action Consistency Review form will be submitted concurrently with the regulatory permitting process.

The generalized study area also lies within the area covered by the Town of Stratford Coastal Community Resilience Plan (CCRP). The purpose of this plan is to provide the roadmap to make the community more resilient (economically, socially, and ecologically) to coastal flooding and the effects of sea level rise. Drafted in 2016, this plan includes recommendations on land use within the town.

5.4.2 Alternative 5A: Sponsor's Proposed Action

The work proposed under this alternative will include grading and construction work within the coastal zone covered under the CCMA and within the Town of Stratford CCRP. The existing land use of BDR as an airport is consistent with the CCMA and the CCRP. This project's scope, including grading and installation of the EMAS, does not alter that land use and does not represent an adverse impact on coastal resources.

As part of the grading required for the lateral RSA, impacts on tidal wetlands are anticipated. These impacts will be mitigated, with the specific nature and location of that mitigation to be determined during the permitting process with the CT DEEP and the USACE. As these impacts will be mitigated, any negative impacts on coastal resources will be offset.

The proposed scope of activities is anticipated to be consistent with the Connecticut CCMA and the Town of Stratford CCRP. This consistency will be verified during the permitting process with CT DEEP.

5.4.3 Alternative 6: No-Action Alternative

This alternative will be consistent with the CCMA as no activity within the coastal zone will occur.

5.4.4 Mitigation Measures

Mitigation measures for impacts on tidal wetlands will be evaluated and determined during the permitting phase of the project in conjunction with CT DEEP.

5.5 DEPARTMENT OF TRANSPORTATION (DOT) ACT, SECTION 4(F)

Section 4(f) of the DOT Act of 1966 (recodified in 1983 as Title 49, Section 303(c) of the USC) provides for the protection of publicly owned recreational resources and requires the analysis of potential impacts on these resources arising from DOT actions. Resources protected under Section 4(f) include public parks and recreation areas and wildlife and waterfowl refuges or management areas of national, state, or local significance. Section 4(f) also applies to historic sites of national, state, or local significance as determined by the official that has jurisdiction over these historic resources. This section describes the significance threshold(s) pertaining to Section 4(f) resources, describes methodologies used to determine the potential effects, and identifies the potential Section 4(f) resource impacts.

5.5.1 Significance Threshold

FAA Order 1050.1F Desk Reference provides the FAA's significance threshold for Section 4(f), which states that a significant impact would occur if "*the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a 'constructive use' based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource.*" For Section 4(f) purposes, an action would "use" a resource in one of two ways.

- **Physical Use:** The action physically occupies and directly uses the Section 4(f) resource. An action's occupancy or direct control (via purchase) causes a change in the use of the Section 4(f) resource.

- Constructive Use: The action indirectly uses a Section 4(f) resource by substantially impairing the resource's intended use, features, or attributes.

5.5.2 Alternative 5A: Sponsor's Proposed Action

As previously discussed in Section 4.7, there are no historic sites of national, state, or local significance within or adjacent to the study area.

The Sponsor's Proposed Action involves modification of Runway 11-29 and removal of obstructions on both ends. The proposed tree removal that is off airport property and off the Runway 29 end is located within the Town of Stratford on the Stratford landfill. According to the Town of Stratford parcel map, Short Beach Park is included on a contiguous parcel with the landfill. Although part of the contiguous parcel with the park, the landfill is currently fenced off with public access restricted. All the tree removal would be north of Dorne Drive and within the landfill. Coordination with the Town of Stratford Parks Department indicated they have no concerns with the removal of the trees in the landfill area (see Appendix B). Since the tree removal is contained to the landfill, which the public does not have access to, no Section 4(f) impact would occur.

5.5.3 Alternative 6: No-Action Alternative

The No-Action Alternative would have no impact on Section 4(f) resources.

5.6 SECTION 6(F) RESOURCES

A Section 6(f) resource is a property that was acquired or developed with financial assistance under the LWCF. Section 6(f) prohibits the conversion of a 6(f) resource to a non-recreational purpose without the approval of the NPS.

5.6.1 Alternative 5A: Sponsor's Proposed Action

As discussed in Section 4.9, nine 6(f) resources are located near the Sponsor's Proposed Action. Eight separate sites, funded by the USFWS, are a part of the Stewart B. McKinney National Wildlife Refuge. A separate site, funded by a State and Local Assistance Program, is in Short Beach Park. The Sponsor's Proposed Action would not require the acquisition of lands within the nine listed resources; therefore, Section 6(f) resources would not be impacted.

5.6.2 Alternative 6: No-Action Alternative

The No-Action Alternative would not impact a Section 6(f) resource.

5.7 FARMLANDS

Farmlands are defined as those agricultural areas considered important and protected by federal, state, and local regulations. These significant farmlands include all pasturelands, croplands, and land considered to be prime, unique, or of statewide or local importance. According to the FAA Order 1050.1F Desk Reference, the NRCS FPPA and its implementing regulations (7 CFR § 657.5) define prime, unique, statewide, and locally important farmlands as:

- Prime farmland: farmland with the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops

- Unique farmland: farmland that is classified as producing high-value food and fiber crops
- Statewide and locally important: farmland that has been designated as “important” by either a state government, by county commissioners, or by an equivalent elected body

The FPPA (7 USC 4201-4209) of 1984 was implemented to protect and preserve farmland for agricultural use as part of the 1980 Farm Bill (PL 97-98, Title XV, Subtitle I; 7 USC 4201-4209). This policy, however, does not apply to land already committed to urban development or water storage, regardless of its importance as defined by the NRCS.

5.7.1 Significance Threshold

According to FAA Order 1050.1F, a significant impact would occur if the total combined score on the Form AD-1006: *Farmland Conversion Impact Rating Form* ranges between 200 and 260 points.

5.7.2 Alternative 5A: Sponsor’s Proposed Action

According to the NRCS Web Soil Survey for Fairfield County, Raypol silt loam, Walpole sandy loam (0 to 3 percent slopes), and Ninigret fine sandy loam (0 to 3 percent slopes) are found within the project area. These soils are mapped as either Prime Farmland or Farmland of Statewide Importance and are protected by the FPPA. The Connecticut Department of Agriculture preserves farmlands through the Farmland Preservation Program, which aims to ensure the land remains available only for agricultural use. Prime Farmland and Farmland of Statewide Importance are protected under the Farmland Preservation Program.

Safety improvements to Runway 11-29 resulting from the Sponsor’s Proposed Action will not occur on farmlands. These improvements are entirely within airport property on lands committed to urban development. However, tree obstruction removal will occur on soils of Prime Farmland and Farmland of Statewide Importance. The trees identified as obstructions will be cut and removed; however, the stump and root system of all felled trees will be allowed to remain in place to preserve the existing soil stability and topographic profile. The selected removal method would not result in impacts on soil, and existing agricultural production will not be converted to non-agricultural use. Alternative 5A would not result in a significant impact on farmland.

5.7.3 Alternative 6: No-Action Alternative

The No-Action Alternative would not have an impact on prime, unique, or statewide-important soils.

5.7.4 Mitigation

No mitigation for prime farmland is expected; however, the Commissioner of Agriculture will be contacted to obtain approval prior to any construction or site activity in accordance with the Connecticut Farmland Preservation Program (CGS 47-42d).

5.8 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

This section provides an impact analysis for hazardous materials, solid waste, and pollution prevention. The analysis considers impacts as defined by the FAA’s thresholds of significance contained in the FAA Order 1050.1F Desk Reference, which defines a significant impact for hazardous materials, pollution prevention, and solid waste as one where the proposed action or connected action involves a property on or eligible for the U.S. EPA’s NPL.

5.8.1 Significance Threshold

The FAA has not established a significance threshold for hazardous materials, solid waste, or pollution prevention; however, an effect on any of the listed criteria below would indicate a potential for significant adverse effect:

- Impact a contaminated site
- Violate hazardous waste or solid waste management laws and regulations
- Produce hazardous waste
- Produce solid waste that would exceed local capacity
- Adversely affect human health and the environment

5.8.2 Alternative 5A: Sponsor's Proposed Action

Alternative 5A was evaluated for the potential to result in impacts associated with the generation, use and/or disposal of hazardous materials and municipal solid waste. The opportunities for Alternative 5A to undertake pollution prevention measures are also identified.

Hazardous Materials

The ninth operable unit of the Raymark Industries, Inc. Superfund site, called Short Beach Park and Stratford Landfill, is located directly east of runway end 29 and Short Beach Road. While a permanent remedy will be required to protect public health in the future, a 2005 U.S. EPA investigation found that the site poses no immediate risk to workers or recreational users after a temporary cap was installed on a portion of the site where Raymark waste was found to be present. Alternative 5A would include selective removal of trees in this area with limited ground disturbance. Tree stumps and root systems of all felled trees would remain in place to preserve the existing soil stability and topographic profile. Hazardous waste would not be generated during tree removal or other construction activities associated with the project.

Solid Waste

Demolition of runway pavement, tree obstruction removal, and other construction activities would result in the generation of solid waste. The feasibility of reusing materials from the demolition would be assessed during the design phase. Waste would be transported and disposed of as directed by the appropriate authorities. Except for limited vegetative matter that may be spread on site for decomposition, all tree clearing debris would be removed, transported off site by the contractor, and recycled, as specified in the design plan. This recycling may include salvaging timber (lumber), firewood, and woodchips for landscaping or pellets. Solid waste generated during operation, after construction is complete, would not be impacted. According to the CT DEEP, there are 17 active landfills in Connecticut. Solid waste generated from construction is not anticipated to create capacity problems at the local landfill.

Pollution Prevention

A variety of hazardous materials, such as vehicle and aviation fuels/solvents released to the environment from a spill, ground support equipment accident, etc., could be found at an airport. Specifically, BDR addresses pollution prevention through stormwater management, proper storage, and handling of hazardous materials via their Spill Prevention, Control, and Countermeasures (SPCC) plan and best management practices for maintenance activities. BDR currently has an approved National Pollutant Discharge Elimination System (NPDES) general permit (No. CTGSI0833) and an airport-wide Stormwater Pollution Prevention Plan (SWPPP). During design, there would be a construction specific SWPPP that

would be completed and approved prior to construction. The construction SWPPP would identify BMPs like proper rock construction entrances and erosion and control measures (filter sock, silt fence, etc.) to be implemented during construction.

5.8.3 Alternative 6: No-Action Alternative

The No-Action Alternative assumes that there would be no construction at the airport beyond those projects that have already received environmental approval and that would occur independent of the Sponsor's Proposed Action. No hazardous waste or solid waste impacts are expected under this alternative.

5.9 HISTORIC, ARCHEOLOGICAL, ARCHITECTURAL, AND CULTURAL RESOURCES

The Sponsor's Proposed Action and alternatives have been evaluated in compliance with Section 106 of the National Historic Preservation Act, 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:

Step 1: Initiate the 106 process through early coordination with the SHPO and other interested parties (36 CFR§800.3: *Initiation of the Section 106 process*).

Step 2: Identify cultural resources that are listed in or are eligible for listing in the NRHP (36 CFR§ 800.4: *Identification of Historic Properties*)

Step 3: Assess the effects the project will have on eligible or listed properties (36 CFR§800.5: *Assessment of Adverse Effects*)

Step 4: Resolve adverse effects in consultation with the SHPO and, if necessary, the Advisory Council on Historic Preservation (36 CFR§800.6: *Resolution of Adverse Effects*)

The methodology for identifying potential historic resources is 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 36 CFR 800.5, Assessment of Adverse Effects. The methodology for providing a resolution for any such adverse effects is 36 CFR 800.6, Resolution of Adverse Effects.

5.9.1 Significance Threshold

According to FAA Order 1050.1F, the FAA does not have a threshold for significant impacts for cultural resources; however, it has identified "factors" to consider when evaluating the "context and intensity" of potential impacts. *"This factor includes, but is not limited to, situations in which the proposed action or alternative(s) would result in a finding of Adverse Effect through the Section 106 process. For historic properties subject to Section 4(f) of the DOT Act, a significant impact would occur when the action involves more than minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource."*⁷

5.9.2 Alternative 5A: Sponsor's Proposed Action

Early coordination with the Connecticut SHPO and Stratford Historical Society was initiated on June 2, 2021. A Phase 1 Archeological Reconnaissance Survey for the detailed study area was performed as

⁷ FAA Order 1050.1F Desk Reference (v2), Chapter 8

recommended in the SHPO's response. The survey determined that no cultural resources were present within the project area. The SHPO concurred via correspondence received on October 14, 2021, stating that no historic properties will be affected by the proposed undertaking. Full SHPO coordination can be found in Appendix D.

Alternative 5A would not impact historic, archeological, architectural, or cultural resources, as none are present within the study area. If any archeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, construction in the immediate area would be stopped, and the Connecticut SHPO would be notified immediately.

5.9.3 Alternative 6: No-Action Alternative

The No-Action Alternative would not impact historic, archeological, architectural, or cultural resources.

5.10 LAND USE

The assessment of potential land use and planning effects of the No-Action Alternative and the Sponsor's Proposed Action focuses on identifying applicable federal, regional, state, and local land use plans and policies and assessing the alternatives' consistency to these plans and policies. The CEQ regulations require discussing environmental impacts, including possible conflicts between the proposed action and the objectives of federal, regional, state, and local land use plans, policies, and controls for the area concerned. Where an inconsistency exists, the NEPA document should describe the extent to which the FAA would reconcile its actions. Airport actions, such as disruption of a community, relocation of residences/businesses, or impacts on other impact categories may affect land use compatibility.

5.10.1 Significance Threshold

The FAA has not established a significance threshold for land use or identified specific factors to consider in making a significance determination for land use. The FAA cannot approve funding unless the project is consistent with the plans of public agencies for the development of the area in which the airport is located. Additionally, the determination of whether a significant impact exists for land use is often dependent on the impacts of the proposed action or alternatives on other environmental resource categories.

5.10.2 Alternative 5A: Sponsor's Proposed Action

Alternative 5A includes modifications to the runway at BDR and obstruction tree removal. Modifications to the runway will occur on airport property. The land use for airport property is designated as "Airport Operations;" therefore, runway modifications are consistent with that classification. Areas of obstruction removal are designated as Airport Operations, Open Space, and Industrial land uses. Tree removal represents a maintenance activity and not a change in land use. According to the City of Stratford, the detailed study area is zoned as Retail Commercial or Industrial. Alternative 5A is consistent with local zoning ordinances.

The effects of tree removal on other environmental issues have been evaluated in this EA and have been found to have no significant impacts. Although not well defined in NEPA or other state environmental review processes, these environmental issues tend to collectively account for community character and quality of life within a community or neighborhood, which leads to discussions of land use compatibility. The fact that the obstruction removal has been demonstrated in this EA not to result in any significant impacts on environmental, social, or cultural resources further supports the fact that this action would

not impact land use compatibility or community character and quality of life. Alternative 5A would have no significant impact on land use or zoning.

5.10.3 Alternative 6: No-Action Alternative

Under the No-Action Alternative, current land use and zoning would remain unchanged. Existing communities; businesses; and federal, regional, state, and local plans/policies would continue uninterrupted.

5.11 NATURAL RESOURCES AND ENERGY SUPPLY

Airport operations require energy in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline to power, cool, heat, and provide lighting. Energy requirements associated with airport development generally fall into two categories: those for stationary facilities (terminal and other buildings) and those for aircraft operations. Stationary facilities use utility energy (electric energy and natural gas) to provide lighting, cooling, heat, and hot water to buildings, the airfield, and parking areas. Aircraft operations consume fuel to operate the aircraft and power ground support equipment that service the aircraft. Finally, natural resources, such as sand, gravel, water, wood, concrete, asphalt, and steel, are typically used during airport construction projects.

5.11.1 Significance Threshold

FAA Order 1050.1F does not establish a significance threshold for natural resources or energy supply. Normally, a significant impact would be considered when the construction or operation of a proposed action causes the demand for limited consumable natural resources and energy to exceed available or future supplies.

5.11.2 Alternative 5A: Sponsor's Proposed Action

Energy demand and natural resource use associated with Alternative 5A are expected to be minimal. An increase in demand for energy would be limited to construction vehicles and equipment. Natural resources will be used during the reconstruction of the runway. Energy demands and natural resource consumption associated with the Sponsor's Proposed Action are expected to be minimal as an increase in the demand for energy supplies would only occur during construction.

5.11.3 Alternative 6: No-Action Alternative

The No-Action Alternative would not require an increase in natural resource use or energy supply as no changes would occur with this alternative.

5.11.4 Mitigation

During the design stage, the feasibility of reusing waste materials generated during pavement removal and utilized in the new pavement section will be evaluated. Full depth reclamation, the process of pulverizing and blending the asphalt pavement and portions of the underlying materials on site to provide upgraded, homogenous materials, could reduce the need for additional natural resources. Full depth reclamation also decreases energy consumption, as the need for importing and exporting materials would be less.

5.12 NOISE

According to FAA environmental regulations, future conditions should be analyzed to identify if noise exposure levels are significant enough to pose a significant impact. The fundamental element of this noise analysis is a comparison of the current noise impacts as discussed in Section 4.3 to the 2026 (anticipated year of completion) Build Alternative to assess potential project-related noise effects.

5.12.1 Significance Threshold

According to FAA Order 1050.1F Desk Reference, the FAA's significance threshold for noise is if an action would increase noise levels by DNL 1.5 decibels (dB) or more over a noise sensitive area that is currently exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No-Action Alternative for the same timeframe. An increase from DNL 66 dB to 67.5 dB is considered a significant impact, and an increase from DNL 63.5 dB to 65 dB is also considered an impact.

5.12.2 Alternative 5A: Sponsor's Proposed Action

Like the existing conditions, the 2026 noise impacts are derived from the approved 2021 Part 150 NEM Update. The proposed 150-foot shift of Runway 11-29 is expected to be completed by the end of 2025; however, the NEM Update analyzed noise contours for the 2026 Master Plan forecast year as depicted in Figure 4-3. The contours depict lines of contiguous noise exposure expressed in dB. DNL, as previously mentioned, is the FAA approved method for land use compatibility determinations in airport noise studies. The DNL noise contours are shown on the figure beginning at 55 DNL and increasing in 5 dB increments to 75 DNL. The 55 and 60 DNL are included for informational purposes only.

The area within the 65 DNL contour consists primarily of airport property. Most of the off-airport property within the 65 DNL is open space or wetland. There is a small area of industrial land use north of Runway 24 and a small portion of commercial land use south of Runway 29 within the 65 DNL. These land uses are compatible with aircraft noise below 70 DNL.

Overall, compared to the existing airfield layout, the 150-foot Runway 11-29 shift, while accounting for forecast conditions, would result in noise contours being shifted slightly towards the west, away from the proximity of a high occupancy land use just beyond the Runway 29 end. No incompatible land uses are within the 65 DNL because of the runway shift and forecasted activity. It is important to note that while noise contours were created under the assumption of 2026 forecast activity, it is safe to assume that the 2025 activity levels (year of anticipated project completion) will be lower and thus also result in no noise impacts.

5.12.3 Alternative 6: No-Action Alternative

The No-Action Alternative would maintain the existing noise contours, and there would be no impact on non-compatible land uses.

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

According to FAA Order 1050.1F, the FAA must evaluate proposed actions and their effect on the surrounding community's socioeconomics. Socioeconomic resources include population, income, employment, and economics. Socioeconomic resources also include sensitive populations, such as

minorities, low-income communities, and children, as mandated by EO 13045 Protection of Children from Environmental Health Risks and Safety Risks and EO 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. EO 13045 states that federal agencies shall identify and address environmental health and safety risks from their activities, policies, or programs that may disproportionately affect children. EO 12898 serves to avoid the disproportionate placement of adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations.

The EPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Title VI was enacted as part of the Civil Rights Act of 1964 to protect against discrimination based on race, color, and national origin in programs and activities receiving federal financial assistance. To prevent further occurrences, EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was authorized in 1994.

5.13.1 Socioeconomics

Social impacts can consist of a wide range of considerations, as discussed below. The social and economic concerns are always specific to a proposed action and may include impacts such as displacement of residents, neighborhood disruption, tax base reduction, school population changes, change in public services, and other community concerns. Socioeconomic impacts are typically defined as disruptions to surrounding communities, including shifts in patterns of population movement and growth, changes in public service demands, loss of tax revenue, and changes in employment and economic activity stemming from airport development. These impacts may result from the closure of roads, increased traffic congestion, acquisition of business districts or neighborhoods, and/or disproportionately affecting low-income or minority populations.

According to Chapter 12 of the FAA Order 1050.1F, Desk Reference, the FAA has not established significance thresholds for socioeconomic effects. The FAA has identified issues to consider when evaluating potential environmental impacts for socioeconomics. If any of the issues exist, they are evaluated to determine if the impact is significant. Some of the factors to consider include, but are not limited to, circumstances in which a proposed action would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area)
- Disrupt or divide the physical arrangement of an established community
- Cause extensive relocation when sufficient replacement housing is unavailable
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding community
- Produce a substantial change in the community tax base

Alternative 5A: Sponsor's Proposed Action

Alternative 5A would improve safety for aircraft currently utilizing Runway 11-29. It is not intended to increase operations at BDR. Therefore, the project is not anticipated to induce economic growth for the

area. Similarly, the project will not result in developing off-airport property, which would result in the division of a community or relocation of residents or businesses. With no displacement of populations, there would be no impact on school populations. There would be no impact on any sector's tax base or tax revenue as property values are unlikely to be impacted by tree removal. While on-road traffic patterns may slightly be altered during construction, the change will be insignificant, and the project will not impact local traffic patterns.

Alternative 6: No-Action Alternative

Socioeconomics of the surrounding communities will not be impacted by the No-Action Alternative, as the economy and attributes of the surrounding area will remain unchanged.

5.13.2 Environmental Justice

According to FAA Order 1050.1F, the FAA has not established a significance threshold for environmental justice; however, the FAA has identified factors to consider. *"The factors to consider that may be applicable to environmental justice include, but are not limited, to a situation in which the proposed action or alternative(s) would have the potential to lead to a disproportionately high and adverse impact on an environmental justice population, i.e., a low-income or minority population, due to:*

- *Significant impacts in other environmental impact categories; or*
- *Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines is unique to the environmental justice population and significant to that population."*

Alternative 5A: Sponsor's Proposed Action

Section 4.12 examined the census tracts surrounding the project area. Census Tracts 804, located north of the detailed study area, was found to contain an EJ population. Discussions around other impact categories have determined that significant impact would not occur from the Sponsor's Proposed Action. That includes impacts that would be unique to the EJ population. Any short-term construction impacts would be experienced by EJ and non-EJ communities alike.

Alternative 6: No-Action Alternative

While there is an EJ population within the vicinity of the project area, the No-Action Alternative would not impact any communities.

5.13.3 Children's Environmental Health & Safety Risks

Like other socioeconomic impact subcategories, the FAA does not have a significance threshold for children's environmental health and safety risks. However, if a proposed action would make available products or substances that could harm children by contact or ingestion through the air, food, drinking water, recreational waters, or soil, then the project would result in a significant impact on children's health or safety.

Alternative 5A: Sponsor's Proposed Action

Tree obstruction removal on the Runway 29 end would occur within the boundaries of the Stratford Landfill NPL site. As mentioned before, the EPA has concluded that the site poses no immediate risk to workers or recreational users but will require further action to protect public health in the future. Alternative 5A specifies tree removal methods that prevent soil disturbance, preventing the release of

potential contamination from the site to the surrounding area. No impacts on children's health or safety are anticipated because of this project.

Alternative 6: No-Action Alternative

Because the No-Action Alternative results in no impact on any environmental resources, it would not change the availability of products or substances that could harm children.

5.14 VISUAL EFFECTS

Impacts from light emissions were determined by evaluating changes in the airport and evaluating the potential for the change to create an annoyance for land uses in the study area. Impacts on visual resources and character were determined by considering the potential changes in landscape and viewshed within the detailed study area.

5.14.1 Significance Threshold

According to FAA Order 1050.1F Desk Reference, the significant determination for both light emissions and visual effects is dependent on the following criteria:

Light Emissions

- Would the proposed action have the potential to create an annoyance or interfere with normal activities from light emissions?
- Would the action have the potential to affect the visual character within the study area from new light emissions?

Visual Effects

- Would the action have the potential to affect the area's visual character, including the uniqueness and aesthetic value?
- Would the action have the potential to contrast with the visual resources in the area?
- Would the action have the potential to block or obstruct the views of visual resources?

Alternative 5A: Sponsor's Proposed Action

Tree removal would take place during daylight hours. Runway construction work would take place during daylight hours when practical. Light emissions generated during nighttime construction could potentially create annoyance; however, the area surrounding the project is primarily airport property surrounded by open space, industrial, and commercial areas.

Alternative 5A would alter the landscape of the project area by removing trees. Trees proposed for removal on the Runway 29 end are located either on top of or at the base of the former Stratford Landfill. Vegetation in this area consists of grasses and shrubs, stands of *Phragmites australis*, and stands of trees. The ground elevation, resulting from the landfill, acts as a barrier between the airport and the recreational resources to the south and east. The tree removal area off Runway end 11 is similar in landscape, consisting of mostly grasses and shrubs. Tree removal in this area will be consistent with the landscape. In both areas, smaller trees and understory would remain after clearing. The Sponsor's Proposed Action is not anticipated to result in an impact from light emissions or visual effects. For tree removal on that is proposed off airport on the western end may impact a small parcel where the Town of Stratford pump station is located. The Town of Stratford has requested that if trees are removed that currently offer aesthetic buffering, that different low growing trees and/or bushes be planted to continue providing a vegetative buffer.

Alternative 6: No-Action Alternative

The No-Action Alternative would not create light emissions or visual effects.

5.15 WATER RESOURCES

Water resources are comprised of surface waters and groundwater that are important in providing drinking, recreation areas, essential habitat for wildlife, and aquatic ecosystems. Wild and scenic rivers, surface water, groundwater, floodplains, and wetlands are all included under the water resources category.

5.15.1 Wetlands

According to FAA Order 1050.1F, Desk Reference, wetlands would be significantly impacted if the Sponsor's Proposed Action were to:

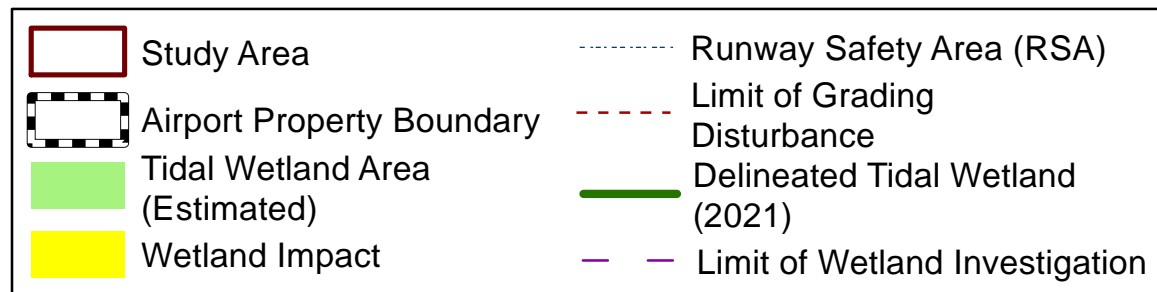
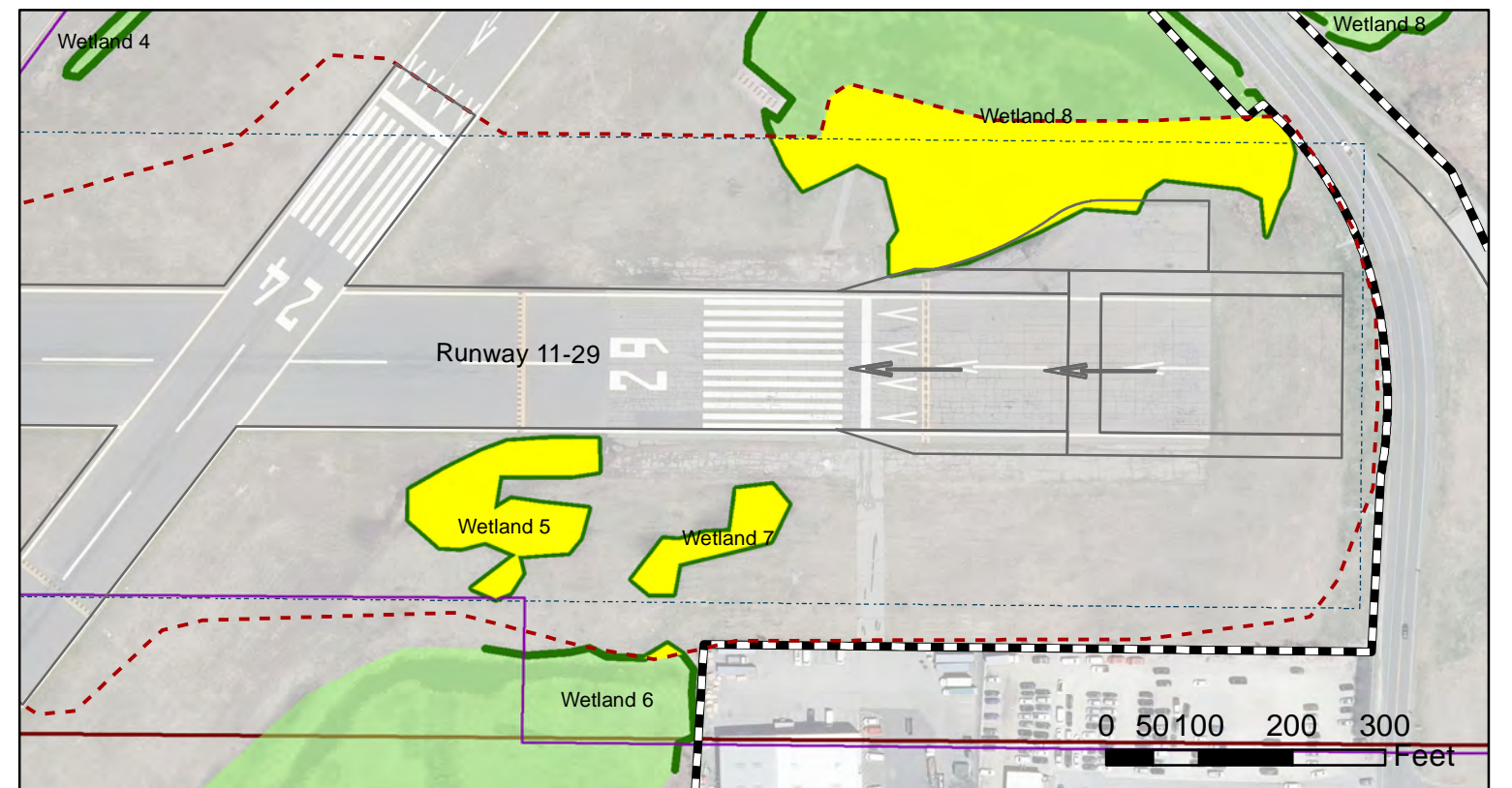
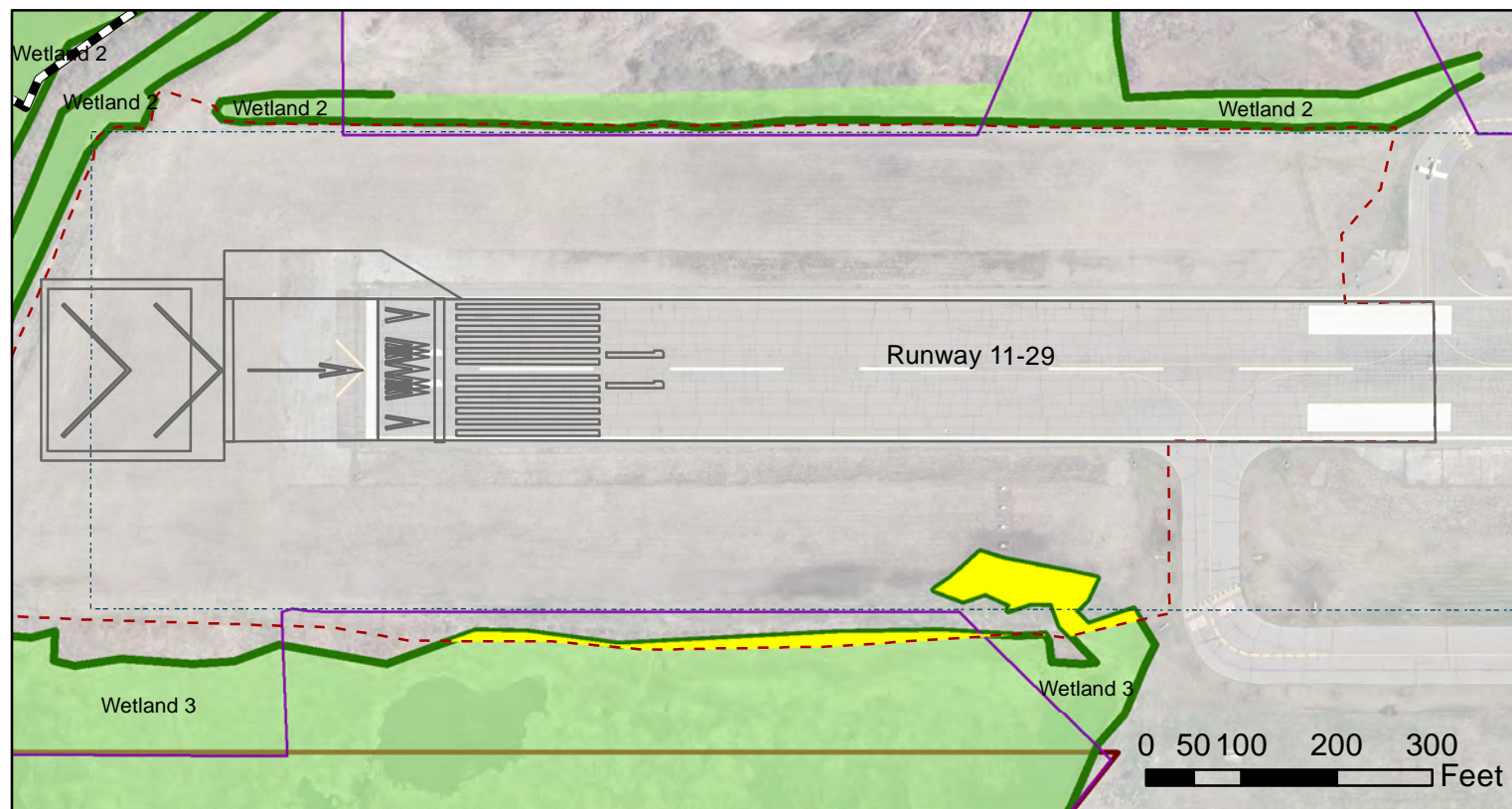
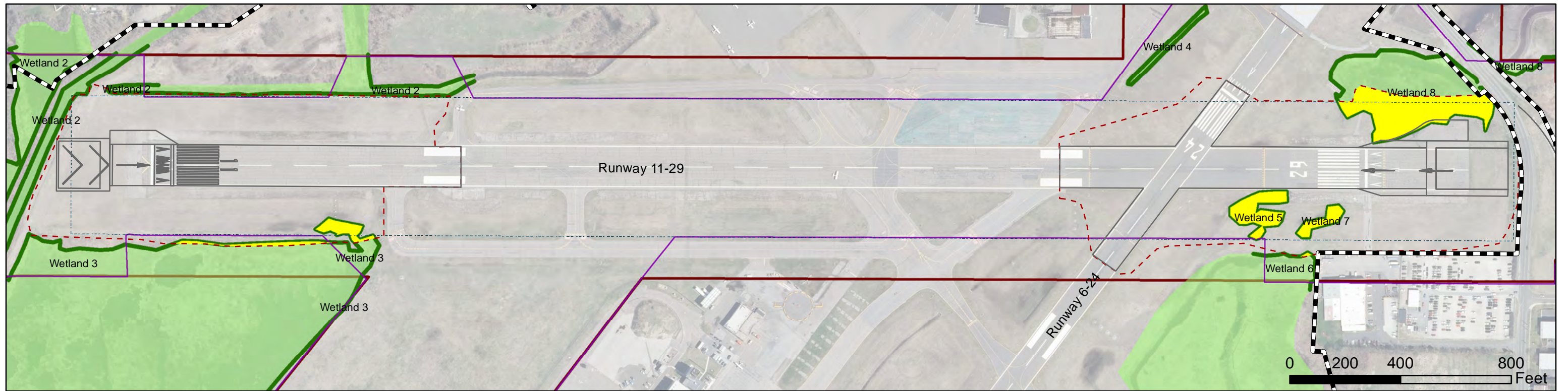
- Adversely affect the function of a wetland relative to the quality and quantity of municipal water supplies and maintenance of natural systems
- Substantially alter the hydrology necessary to sustain a wetland
- Substantially reduce the ability of a wetland to retain floodwaters or storm runoff
- Promote the development of secondary activities that would cause the circumstances listed above

Alternative 5A: Sponsor's Proposed Action

The proposed RSA improvements included in Alternative 5A would result in both permanent and temporary impacts on wetland resources. Figure 5-2 depicts the areas of wetland impact associated with the RSA improvements. The limits of delineated tidal wetlands are depicted by a dark green line, and the light green shaded areas represent the overall estimated limits of tidal wetlands for the site. With this alternative, the EMAS systems would be designed to avoid impacts on tidal wetlands to the greatest degree practicable.

At the Runway 11 end of the project, the EMAS system would be installed to avoid any permanent or temporary wetland impacts. Most of the proposed lateral RSA grading improvements would avoid wetland impacts, except for a tidal wetland area (Wetland 3) to the south of Runway 11, just west of Taxiway G. This wetland would be impacted by direct filling of the wetland to create a uniform ground elevation within the RSA. Small temporary impacts may also be associated with this wetland due to construction access. The portion of the tidal wetland to be impacted consists of an "infield" wetland area that is regularly mowed and maintained but still qualifies as a wetland based on soils, vegetation, and hydrology. This wetland connects to a larger natural wetland area to the southwest. The impacted portion of Wetland 3 is dominated by hydric herbaceous vegetation species and contains a subpopulation of the state-threatened plant species Field Paspalum (*Paspalum laeve*). The total area of impact on Wetland 3 is anticipated to be approximately 0.3 acres.

At the Runway 29 end of the project, wetlands are located on both sides of the runway within the RSA limits. While the proposed EMAS installation would not result in impacts on tidal wetlands, four wetland areas, including Wetland 5, Wetland 6, Wetland 7, and Wetland 8, would be impacted to some degree by the proposed lateral grading of the RSA. Wetlands 5 and 7 are isolated "infield" wetlands located entirely within the RSA south of the runway and would be filled to provide a safe RSA ground surface. Based on the non-standard condition of the RSA in this area and the design requirements discussed in Section 1,



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**Figure 5-2
Wetland Impacts
Resulting From
RSA Improvments**

these wetlands cannot be avoided. Wetland 5 is dominated by hydric herbaceous vegetation species and contains a subpopulation of the state-endangered plant species Saltpond Grass (*Leptochloa fusca ssp. fascicularis*). Wetland 7 is dominated by hydric herbaceous vegetation species but does not contain any listed plant species. The total area of impact on Wetlands 5 and 7 are anticipated to be approximately 0.4 acres and 0.2 acres, respectively.

Wetland 6 is a large tidal wetland located south of Runway 29. Most of this wetland is dominated by emergent vegetation; however, the specific impact area within this wetland adjacent to the RSA is dominated by tidal shrubs and emergent vegetation. This wetland is part of former compensatory mitigation for a previous improvement project at BDR. The total area of impact on Wetland 6 is anticipated to be approximately 0.01 acres.

On the north side of Runway 29, Wetland 8 is located immediately adjacent to the runway pavement and turn-around area. Wetland 8 would be partially filled to provide standard RSA grading. These impacts cannot be avoided based on the non-standard condition of the RSA in this area and the design requirements. Small areas of temporary impact could also occur due to construction access, but most work would be conducted from the runway side of the wetland. The southern and western fringes of this wetland are maintained (mowed) during dry periods of the year; however, most of the wetland is too wet for mowing. Wetland 8 is subject to daily tidal ebb-flow fluctuations and is directly connected to the Marine Basin to the east via a culvert under State Route 113. This culvert has a tide gate installed on its eastern end, which restricts the frequency and quantity of tidal flow allowed into the wetland. Much of Wetland 8 is dominated by native tidal wetland vegetation, of which 20 individuals of the state-special concern species Bracted Orache (*Atriplex glabriuscula*) have been documented. The total area of impact on Wetland 8 is anticipated to be approximately 1.3 acres.

Portions of the work associated with Alternative 5A would take place below the CJL/HTL elevation. All tidal wetland areas within the project area are located below the CJL/HTL elevation. All activities below the CJL/HTL elevation would be regulated by the CT DEEP, regardless of if they are in tidal wetlands or upland areas. In addition, state regulations also give CT DEEP jurisdiction over areas up to one foot above the CJL elevation, which may support tidal vegetation. Areas of the airport that are not tidal wetlands but below the CJL/HTL elevation generally include upland lawn areas, open soil areas, and paved areas in the vicinity of the Runway 29 end. Work below the CJL elevation, not located in tidal wetlands, would include grading the RSA, improvements to lighting and signage, removal of old pavement, and installation of new pavement. Table 5-5 below provides a summary of impacts on each of the wetland areas resulting from the RSA improvements.

Table 5-5: Summary of Wetland Impacts Resulting from the RSA Improvements

Wetland ID	Area of Impact (Acres)	Type of Impact
Wetland 3	0.3	Fill material for grading; construction access
Wetland 5	0.4	Fill material for grading; construction access
Wetland 6	0.01	Fill material for grading; construction access
Wetland 7	0.2	Fill material for grading; construction access
Wetland 8	1.3	Fill material for grading; construction access
Total Estimated Wetland Impact	2.21	

Alternative 5A also includes obstruction removal activities to the east and west of Runway 11-29. To the west of the Runway 11 end, individual trees would be removed, many of which are either within wetland areas or on uplands surrounded by wetland areas. Trees proposed for removal located within delineated wetland areas would be cut and removed, while the stumps and root systems would be left in place to avoid soil disturbance. Mechanized removal of the trees utilizing low-ground pressure forestry equipment could be utilized during the winter when the ground is frozen. Should this not be possible, cutting and removal of trees would be accomplished through hand felling and skidding with equipment designed to provide minimal disturbance to the surrounding vegetation. It is anticipated that any minor disturbance would be temporary, and the wetland would quickly re-establish with no long-term impacts. Individual tree clearing would also occur east of Runway 29, but no trees would be removed from wetland areas.

Alternative 6: No-Build Alternative

Under the No-Build Alternative, no changes would occur, and therefore, no immediate direct or indirect impacts on tidal wetlands or estuarine waters are anticipated. It is assumed that any future maintenance activities would not impact tidal wetlands or estuarine waters.

Mitigation Measures

Before the initiation of any construction activities, applicable environmental permits would be required from federal, state, and local regulatory agencies, including:

- USACE Section 404 and Section 10 Individual Permit
- Federal Coastal Consistency Review Approval
- CT DEEP Structures, Dredging, and Tidal Wetlands Permit
- CT DEEP Section 401 Water Quality Certification
- Town of Stratford Inland Wetland and Watercourses Permit

During the design process, efforts would be made to avoid and minimize wetland impacts to the greatest extent practicable. All remaining impacts to tidal wetlands from grading associated with Alternative 5A will require compensatory mitigation to offset the loss of the function and value of the existing wetland areas. The State of Connecticut has established the following order of priority when considering compensatory mitigation:

1. Restore wetland functions and value to a previous existing wetland;
2. Enhance the quality of an existing wetland area through the application of habitat management techniques and/or native plantings;
3. Create a wetland in an upland area. This involves the introduction of wetland hydrology, hydrophytic vegetation, and tidal influence to an area previously not classified as a tidal wetland.

Several mechanisms exist to allow for the implementation of such compensatory mitigation. In the State of Connecticut, these primarily include either participation in the state in-lieu fee program, or the completion of mitigation by the applicant (known as Permittee Responsible Mitigation). Such mitigation can occur either on-site, adjacent to or in close proximity of the impact locations, or off site at a suitable location generally within the same watershed as the wetland impacts. The USACE prefers compensatory mitigation to be accomplished through the use of an in-lieu fee program or wetland mitigation bank. Preliminary coordination with the CT DEEP indicates that the agency generally prefers Permittee Responsible Mitigation but has also identified an in-lieu fee wetland restoration project in close proximity to the airport location.

Wetlands, as part of their function and value, can be attractive to many types of wildlife, including many which rank high on the list of potentially hazardous wildlife species identified by the FAA in Advisory Circular 150/5200-32. Consequently, the FAA recommends that when unavoidable wetland impacts result from airport projects, the compensatory wetland mitigation be located at least 10,000 feet from the Airport Operations Area (AC 150/5200-33C). As previously discussed, review of the FAA Wildlife Strike Database has indicated an increase in runway incursions by potentially hazardous wildlife and a corresponding increase in reported wildlife strikes.

As part of the implementation of Alternative 5A, BDR would propose a compensatory wetland mitigation package (utilizing wetland restoration, enhancement/preservation, creation, or a combination thereof) that will satisfy both the CT DEEP and the USACE, replacing the wetland function and value of the areas permanently impacted by the proposed project. While it is recognized that on-site wetland restoration is a valid and desired mitigation methodology by the regulatory agencies, the unique circumstances of an active airport and the potential wildlife hazards arising from such mitigation favor a mitigation package that takes advantage of the existing Connecticut In-Lieu Fee Program.

Coordination with various regulatory agencies is ongoing, and mitigation measures will be further determined as part of the environmental permitting during the design process. The project sponsors will adhere to special conditions and mitigation measures that may emerge through these coordination processes.

5.15.2 Floodplains

According to FAA Order 1050.1F, the significance threshold for floodplains would apply if the proposed action would cause notable adverse impacts on natural and beneficial floodplain values. The natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2: *Floodplain Management and Protection* and in Section 25-68d of the Connecticut General Statutes.

Alternative 5A: Sponsor's Proposed Action

As most of the airport is located within FEMA coastal zone AE, the proposed safety improvements to Runway 11-29 shown in Alternative 5A will result in the placement of fill in the floodplain. Given the coastal flooding environment and lack of a regulated floodway, there is no direct correlation between the fill and an increase in 100-year (1% AEP) water surface elevations; however, the proposed improvements will result in an encroachment on the base floodplain. Therefore, the FAA must determine if the

encroachment is a “significant floodplain encroachment” using the criteria contained in FAA Order 1050.1F and discussed below:

- Impacts on human life and transportation facilities: The Sponsor’s Proposed Action will shift Runway 11-29 to the west 150 feet, install EMAS on both ends of the runway, and correct the non-standard lateral RSA conditions (non-standard grading, wetlands). Based on the adopted sea-level change for Connecticut, the 20-inch increase in Mean Higher High Water projected by 2050 will inundate the eastern end of Runway 11-29 during the normal tidal cycle (see Figure 5-3). To improve the runway profile and mitigate current and future flooding, Alternative 5A will raise the eastern end of Runway 11-29 by approximately 4.5 feet. As the amount of fill associated with this improvement is negligible compared to the storage available in the coastal floodplain, there are no anticipated increases in flood elevations and no adverse impacts anticipated on human life or transportation facilities.
- Impacts on a floodplain’s natural and beneficial values: As most of the area to be filled with the construction of Alternative 5A consists of impervious surfaces, there are minimal natural or beneficial values to the impacted floodplain. The factors to consider when assessing impacts on a floodplain’s natural and beneficial values are summarized below:
 - Agricultural Activities: The impacted floodplain does not have any agricultural value.
 - Aquaculture Activities: No aquaculture activities are within the impacted floodplain.
 - Aquatic or terrestrial organisms: The area to be filled consists of active runway and RSA and, as such, does not provide habitat for aquatic or terrestrial organisms.
 - Flood Control: The area to be filled consists of active runway and RSA and provides negligible storage when compared within the surrounding coastal floodplain.
 - Groundwater Recharge: The construction of Alternative 5A will result in a net reduction of 6.3 acres of impervious surface. As such, an increase in groundwater recharge is anticipated due to the Sponsor’s Proposed Action.
 - Water Quality: The construction of Alternative 5A will result in a net reduction of 6.3 acres of impervious surface. As runoff from impervious surfaces adversely impacts water quality, there is a net benefit expected due to the Sponsor’s Proposed Action.

Alternative 6: No-Build Alternative

The No-Build Alternative would not result in the addition of fill within the base floodplain.

Mitigation Measures

The Sponsor’s Proposed Action will remove existing surplus pavement that is deteriorated and/or causing non-standard conditions resulting in a net reduction of 6.3 acres of impervious surface within the project area. As such, it is expected that the Sponsor’s Proposed Action will benefit water quality and groundwater recharge within the floodplain. A Town of Stratford Development Permit will also be required for work within the floodplain.

5.15.3 Surface Waters

Significance Threshold

A significant impact on surface waters would exist if the action were to impact water quality standards established by federal, state, local, or tribal regulatory agencies or contaminate the public drinking water supply, including an aquifer used for public water supply.



Source: Esri, Maxar, GeoEye, Earthstar, Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- 1 FT Interval Contours
- 5 FT Interval Contours
- Airport_Property

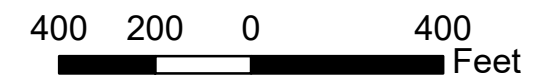
Current Mean Higher High Water

- Low-lying Areas
- Inundated Areas

2050 Projected Mean Higher High Water (Plus 20 inches SLR)

- Low-lying Areas
- Inundated Areas

Igor I. Sikorsky Memorial Airport



Sources: Imagery (esri/State of CT, 2019)

Figure 5-3
Sea Level Rise Impacts

Alternative 5A: Sponsor's Proposed Action

The watershed within the limits of the detailed study area is composed of approximately 43% impervious area and 57% open space. There is a drainage divide located near the midpoint of Runway 11-29, which generally directs runoff to the east and west. Runoff is primarily conveyed as sheet and overland flow through a series of grass channels that discharge to direct tributaries of Long Island Sound. The Sponsor's Proposed Action will remove existing surplus pavement that is deteriorated and/or causing non-standard conditions resulting in a net reduction of 6.3 acres of impervious surface within the watershed (see Figure 5-4). Looking at the watershed divide, approximately 2.7 acres of impervious surface will be removed from the area draining to the east, while 3.6 acres will be removed from the area draining to the west. As the decrease in impervious areas in each of the sub-watersheds will result in a reduction in the volume of stormwater runoff, an increase in groundwater recharge, and an improvement in the water quality, it is anticipated that no additional stormwater treatment facilities will be required. However, due to the total soil disturbance associated with the Sponsor's Proposed Action, the project will require a Construction Stormwater General Permit from the CT DEEP.

Alternative 6: No-Build Alternative

The No-Build Alternative would not adversely impact the water quality of adjacent surface waters.

Mitigation Measures

The Sponsor's Proposed Action would remove existing surplus pavement that is deteriorated and/or causing non-standard conditions resulting in a net reduction of 6.3 acres of impervious surface within the watershed. The decrease in impervious area will increase the groundwater recharge, reducing the volume of stormwater runoff and improving the water quality of adjacent surface waters.

The CT DEEP 2002 Connecticut Guidelines for Soil Erosion and Sediment Control would be utilized during the design and integrated into the construction of the proposed work to manage stormwater and runoff and protect surface waters. Engineered measures, such as cofferdams, may be utilized in specific areas to contain work areas during construction. Post-construction measures to manage stormwater would consist of an overland flow of runoff over lawn areas, consisting of a filter strip measure. No stormwater would be collected as part of the improvements, as under existing conditions.

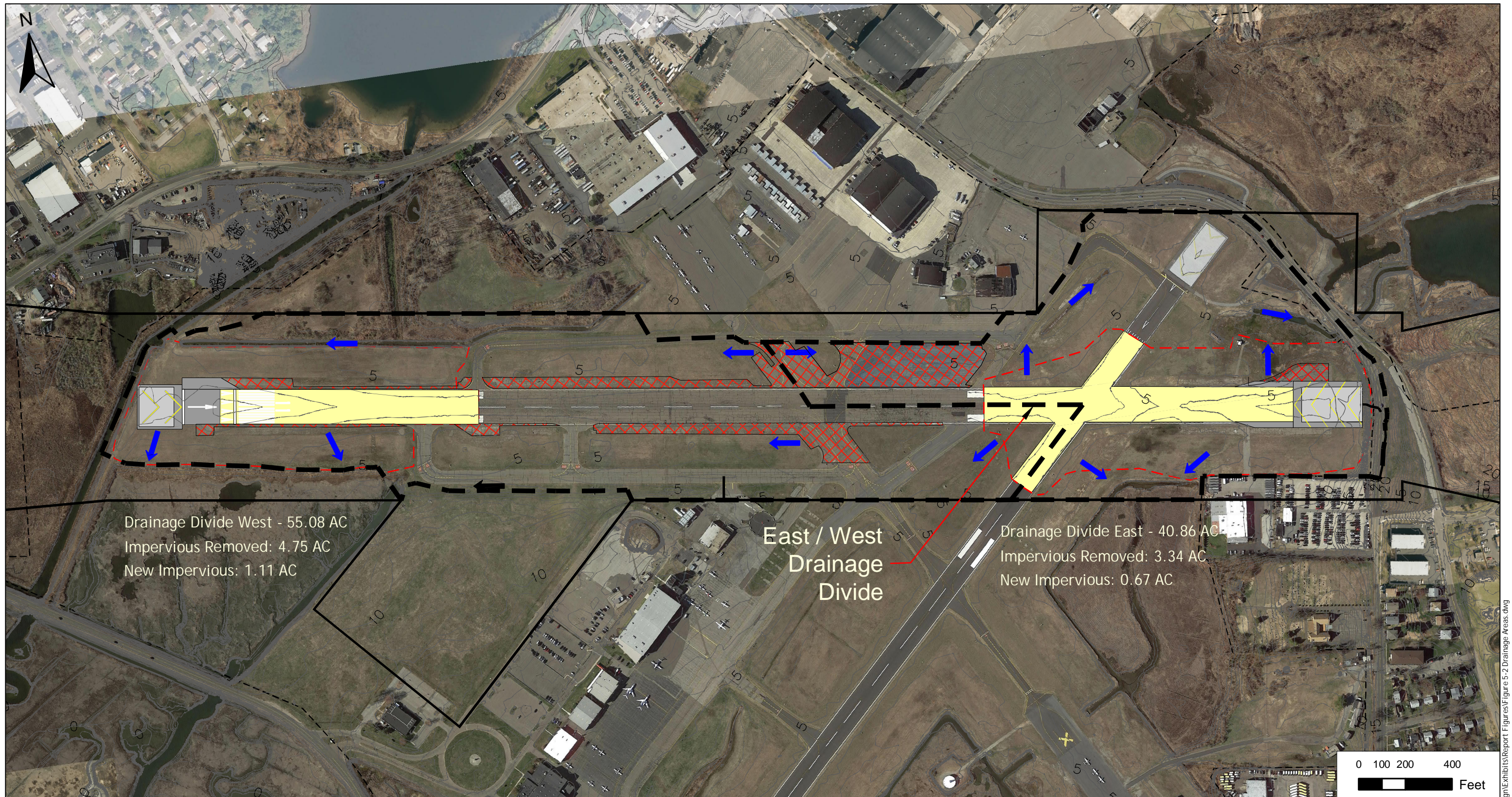
5.15.4 Groundwater

Significance Threshold

A significant impact on groundwater would exist if the action were to impact water quality standards established by federal, state, local, or tribal regulatory agencies or contaminate the public drinking water supply, including an aquifer used for public water supply.



Alternative 5A: Sponsor's Proposed Action

Alternative 5A would include both the construction of impervious surfaces and the removal of areas of old pavement. These actions would result in a net decrease of 6.3 acres of impervious surface within the watershed (refer to Figure 5-4). The portions of existing pavement to be removed would promote infiltration of direct precipitation and runoff from adjacent runway impervious surfaces, thereby helping to recharge groundwater.



Legend	
	New Pavement
	New EMAS Bed
	Existing Pavement Removal
	Pavement Reconstruction
	Drainage Area Boundary
	Study Area Boundary
	Project Limits of Disturbance
	Airport Property Line
	Flow Arrow

Igor I. Sikorsky Memorial Airport



See Insert for Scale

Sources: Imagery (esri/State of CT., 2019)

Figure 5-4
Drainage Area Changes

Alternative 6: No-Build Alternative

Under the No-Build Alternative, no changes would occur, and therefore, no immediate direct or indirect impacts, either beneficial or adverse, on groundwater resources are anticipated. It is assumed that any future maintenance activities would not impact tidal wetlands or estuarine waters.

5.16 CUMULATIVE IMPACTS

Cumulative effects are defined by the CEQ in 40 CFR 1508.7 as *“impacts on the environment which result from the incremental impacts 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.”* Reasonably foreseeable actions should not be limited to those from actual proposals but must also include impacts from actions being contemplated. CEQ regulations further require that NEPA environmental analyses examine connected, cumulative, and similar actions in the same document (40 CFR 1508.25). This requirement prohibits the segmentation of the project into smaller components to avoid required environmental analysis.

CEQ suggests analyzing only those resources that could be incrementally affected by the proposed action and other actions within the same geographic area and time. On its own, the Sponsor’s Proposed Action, as documented throughout this EA, would not cause a significant impact on any of the resource categories contained in FAA environmental orders. However, insignificant impacts on biological resources, coastal resources, and wetlands create the potential for cumulative impacts. The geographic scope of the cumulative impact analysis is contained to the generalized study area. The time frame for the analysis extends three years past (2018-2021) and three years into the future (2022-2025).

5.16.1 Past, Present, and Reasonably Foreseeable Actions

This section lists past, ongoing, and reasonably foreseeable projects on and off airport property within the generalized study area. To identify and describe past, present, and reasonably foreseeable actions, coordination with the airport, review of BDR’s most recent Master Plan, and coordination with the Town of Stratford were initiated. Correspondence with the Town of Stratford is included in Appendix B.

Major development projects undertaken at BDR in the last three years include the construction of a private hangar in 2018 and the construction of four additional private hangars in 2019. Because these hangars were constructed on previously paved areas of the airfield, environmental impact was minimal. The project assessed in this EA is the only major ongoing project at the airport. Other ongoing airport actions are limited to general maintenance projects with no environmental impact. Within the next two to three years, the airport is planning to complete an overlay of remaining pavement on Runway 11-29, the installation of perimeter fencing, and construction of a new terminal, terminal apron, and Taxiway “L” on the west side of the airport. Environmental impacts resulting from the pavement overlay will be assessed through a Categorical Exclusion (CatEx) but are anticipated to be minimal as work is confined to the previous pavement. The proposed perimeter fence and west side development most likely would require their own Environmental Assessment given the potential for wetland impacts.

The Town of Stratford identified several past and future projects within the generalized study area. A 380,000-square-foot distribution center was built at 495 Lordship Boulevard in 2019. Reasonably foreseeable future projects within the generalized study area included construction of a 168,000-square-foot building at 775 Lordship Boulevard, expansion of Nuovo Pasta Production’s facility located at 1330 Honeyspot Road Extension, and the expansion of a building located at 1410 Honeyspot Road Extension

after AMEX moves into the building. Additionally, the installation of a cap on the Stratford landfill could conceivably happen within the next five years.

5.16.2 Potential Impacts

To have an adverse cumulative impact on a specific environmental resource, the Sponsor's Proposed Action must cause some direct or indirect adverse environmental effect in a resource category. The analysis of environmental consequences presented in the previous sections of this chapter determined that the proposed project would only have the potential to have direct impacts on biological resources and wetlands. The sections below summarize the likely cumulative effects of the Sponsor's Proposed Action when also considering past, ongoing, and other reasonably foreseeable projects at and near BDR.

Biological Resources

The Sponsor's Proposed Action, when considered with other past, present, or reasonably foreseeable actions, would not have a significant adverse impact on wildlife or plants within the generalized study area. As discussed in Section 5.2, the Sponsor's Proposed Action has the potential to impact four state-listed plant species, Diamondback Terrapins, and Mudflat Tiger Beetles. The TOY restrictions, the creation of a Plant Protection Plan, and the use of a Plan of Conservation & Protection would be used to mitigate impacts on biological resources, specifically the state-listed plant species that would be impacted by the project. Coordination with DEEP, NOAA, and the USFWS is currently ongoing. Additional recommended mitigation would be included per agency recommendation. Significant impacts are not anticipated.

The airport is proposing to install additional perimeter fencing on the airport's southern and western sides in the foreseeable future. The additional fencing aims to reduce the prevalence of wildlife strikes, as BDR has seen an increase in aircraft-mammal strikes over the last couple of years. A preliminary assessment of fence options included two alignments, which could potentially impact state-listed plant species; however, the city's preferred alignment could likely be avoided and minimize impacts on the state-listed Mudflat Tiger Beetle through conservation measures during fence installation. The construction of the airfield fence would positively impact wildlife, given that it is a wildlife management protocol.

The airport plans to construct a terminal, apron, and associated taxiway in the southwest corner of the airfield. This area consists of mowed grass and does not present suitable habitat for wildlife. Site surveys would determine if impacts on listed plant species would occur. The airport will have to follow local, state, and federal regulations for both projects, which would include agency coordination and mitigation.

The development of the FedEx Distribution Center could have impacted biological resources as it was built on a wetland. Wetland impacts of this development project are discussed in depth in a subsequent section. Both facility expansion projects off-airport and within the Town of Stratford are planned to occur on previously paved land and are unlikely to impact biological resources. The city plans to install a cap on the Stratford Landfill but impacts on biological resources would be minimal. Each development project is required to have its own protective measures to avoid and minimize impacts during implementation. Significant cumulative impacts on biological resources from projects within the generalized study area when combined with the Sponsor's Proposed Action are not anticipated.

Wetlands

According to the NWI mapper, and although unconfirmed, the newly constructed FedEx Distribution center appears to be constructed on approximately five acres of freshwater emergent wetland. An estuarian and marine wetland attached to the Stewart B. McKinney National Wildlife Refuge forms the

southern boundary of the property; however, this wetland is not within the project area. Impacts on wetlands were likely mitigated through compensatory mitigation or constructing new wetland systems.

A preliminary evaluation of impacts for two potential fence alignments was completed as part of the cumulative impact analysis. The estimates of wetland impacts were based on an impact envelope width of 20 feet (10 feet on either side of the proposed fence alignment). The preferred alignment had the potential to impact approximately 1.5 acres of tidal wetlands. The second alignment could potentially impact 3 acres of tidal wetlands. The perimeter fence would have to go through the same NEPA process as the Runway 11-29 safety improvements, and most likely, an EA would be required. These preliminary alternatives and potentially others would be analyzed. The selected alternative would be required to undergo the same Section 401/404 wetland permitting requirements with the USACE and CT DEEP.

The west side development area was also part of the wetland delineation performed for the Runway 11-29 project. The fieldwork indicated that no wetlands exist in this proposed development area. However, this project would also require FAA NEPA review and most likely an EA.

The planned development project located at 775 Lordship Boulevard would not be built on top of a wetland. Nuovo Pasta Production's building expansion (1330 Honeyspot Road Extension) and the AMEC building expansion (1410 Honeyspot Road Extension) would be constructed in previously paved areas. These projects are not anticipated to impact wetlands. Additionally, the city plans to install a cap on the Stratford Landfill. The NWI mapper does not depict wetlands within the landfill area; however, this project would be coordinated with the EPA. Significant cumulative impacts on wetlands from projects within the generalized study area, when combined with the Sponsor's Proposed Action, are not anticipated as permitting and mitigation would be required.

5.16.3 Summary

The Sponsor's Proposed Action, in conjunction with other past, present, and future projects, would not have a significant cumulative impact on the environment. No single impact, even when considered with past or future actions, represents a substantial impact that cannot be mitigated. Therefore, permanent adverse impacts are not expected with the implementation of the Sponsor's Proposed Action. All foreseeable projects would be subject to avoidance and minimization studies and would complete agency permitting as required; therefore, no cumulative impacts would be associated with the Sponsor's Proposed Action or the No-Action Alternative.

5.17 PERMITS

The following permits would be required before elements of the Sponsor's Proposed Action can begin:

- CT DEEP Construction Stormwater General Permit
- Town of Stratford Development Permit
- USACE Section 404 and Section 10 Individual Permit
- Federal Coastal Consistency Review Approval
- CT DEEP Structures, Dredging, and Tidal Wetlands Permit
- CT DEEP Section 401 Water Quality Certification
- CT DEEP Plant Protection Plan
- Town of Stratford Inland Wetland and Watercourses Permit

6 PUBLIC INVOLVEMENT

This section provides a summary of the agency coordination and public involvement efforts that have been conducted during this EA process.

6.1 EARLY AGENCY COORDINATION

In June 2021, at the beginning of the EA process, early agency letters were sent to various federal, state, and local agencies to solicit comments on the Sponsor's Proposed Action and how the project elements could impact the resources each agency has the authority to regulate. The letters included an exhibit illustrating the actions proposed. Agencies were asked to submit any specific concerns they had with the project, any available technical information that would aid in the development of the EA, or any permitting/mitigation requirements that would be necessary for implementation. The agency responses were received through letters and e-mails that have been cataloged and included within Appendix B.

6.2 PROJECT WEBSITE

The public website has been live from the start of the EA process at <http://www.planbdairport.com>. The website contained a project introduction, the NEPA process, project schedules, recordings of public meetings, and draft documents. It also contained a portal to submit questions or comments at any time during the EA process.

6.3 PUBLIC MEETING #1

A virtual public meeting was held on January 20, 2022, from 6:00 P.M. to 7:30 P.M. The meeting provided an overview of the NEPA process, a background on the airport and its facilities, a project schedule, the purpose and need for the project, preliminary alternatives being considered, and a description of the technical studies being completed. A presentation was given to the attendees, followed by informal questions and answers. The public notice, presentation slides, and a list of attendees can be found in Appendix G.

6.4 DRAFT EA & PUBLIC MEETING #2

The Draft EA was made available for review via a public Notice of Availability, which was published in the Fairfield Citizen News and the Connecticut Post on March 20, 2022. The Draft EA was made available at <http://www.planbdairport.com>. Hard copies were made available at the following address:

- Stratford Public Library, 2203 Main Street, Stratford, Connecticut, 06615
- Reeves Memorial Library, 267 Grant Street, Bridgeport, Connecticut, 06610

The city held another virtual public open house on April 20, 2022 from 6:00 P.M. to 7:30 P.M. Written comments received before April 27, 2022, with responses to each comment, will be contained in Appendix G.

7 LIST OF PREPARERS

This chapter identifies the individuals who were primarily responsible for preparing this EA and those who provided an independent review of this EA. The following list is organized by company (or organization) and provides a summary of each individual's responsibilities in the preparation of this EA.

Preparer	Title	Responsibility
City of Bridgeport		
Michelle Muoio, PMP	Airport Manager	Document Review
Federal Aviation Administration		
Richard Doucette	Environmental Protection Specialist	Document Review
Lisa Lesperance	Lead Community Planner	Document Review
CHA Consulting, Inc.		
Paul McDonnell, AICP	Chief Planner, Aviation	Client Manager/Alternatives QC
Mark Heckroth, ENV SP	Aviation Environmental Section Manager	Project Manager/Purpose & Need/Alternatives/QC
Taylor Koutropoulos, ENV SP	Aviation Environmental Planner	Lead Author – Affected Environment & Consequences
Jay Rauschenbach, AICP	Senior Planner	Graphics
Calvin Kuang	Aviation Planner	Noise & Public Involvement
Simon Davies, LEED AP	Senior Environmental Scientist	Biological & Coastal Resources/Wetlands/QC
Kristin Dawe, P.E., LEED AP	Senior Aviation Engineer	Preliminary Engineering
Kris Detlefsen, P.E.	Principal Engineer	Floodplains & Drainage
Kevin Morris	Senior Scientist	Air Quality & Climate
FHI Studio, Inc.		
Stephanie Dyer-Carroll, ACIP	Director – Environmental Services	Quality Control/Review
Daniel Hageman, NHCWS, PSS	Sr. Environmental Specialist	Biological Resources & Wetlands
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Ron Gautreau	Environmental Specialist	Biological Resources
Josh Weiss, PSS	Environmental Specialist	Wetlands
Archeological Consulting Services, Inc.		
Gregory F. Walwer, Ph.D	Director	Phase I Archeological Study