FINAL
ENVIRONMENTAL ASSESSMENT

Air Traffic Control Tower Replacement

Manassas Regional Airport (HEF)

ID Number EAXX-021-12-ARP-1758268508

Prepared for:

City of Manassas

And

U.S. Department of Transportation

Federal Aviation Administration

As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

Prepared by:

RS&H, Inc.

April 14, 2026

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

Responsible Federal Official

4/15/2026

Date

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1
PURPOSE AND NEED

The City of Manassas (City) has undertaken an Environmental Assessment (EA) for the construction and operation of a replacement Airport Traffic Control Tower (ATCT) (i.e., Proposed Action) at Manassas Regional Airport (HEF or Airport). The City proposes to improve the functional and operational capabilities of the service provided by replacing the existing ATCT.

The EA has been prepared pursuant to the National Environmental Policy Act of 1969 (NEPA) and in accordance with *Federal Aviation Administration (FAA) Order 1050.1F, Environmental Impacts: Policies and Procedures*, and *FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.[1] The City is seeking funding from the FAA (e.g., Infrastructure Investment and Jobs Act (IIJA)) and state agencies (e.g., Virginia Department of Aviation) as well as the City to construct the proposed replacement facility. In accordance with 49 U.S.C. § 47017, project grant application approval is conditioned on assurances about airport operations. The 49 U.S.C. § 47107(a)(16) requires the Airport owner and operator to maintain a current Airport Layout Plan (ALP) meeting FAA requirements. This requirement is associated with the Airport's inclusion within the National Plan of Integrated Airport Systems (NPIAS), making it a federally obligated Airport.

The FAA has ALP approval authority over projects that: materially impact the safe and efficient operation of aircraft at, to, or from the airport; adversely affect the safety of people or property on the ground as a result of aircraft operations; or adversely affect the value of prior Federal investments to a significant extent. The proposed ATCT replacement qualifies as a federal action seeking federal funding and requiring an ALP change subject to NEPA requirements.

This EA follows the document format described in FAA Orders 1050.1F and 5050.4B.

1.1 AIRPORT OVERVIEW

The City owns and operates the Airport. The Airport encompasses about 743 acres within the City and about 136 acres in Prince William County. Major roadways near the Airport include Nokesville Road (Route 28) to the north and Prince William Parkway (Route 234) to the east. Bristow Road is west of the Airport, and Brentsville Road is south of the Airport. ***Figure 1-1*** shows the Airport location.

The FAA's NPIAS classifies the Airport as a national general aviation airport, meaning that the Airport "supports the national airport system by providing communities with access to national and global markets" (FAA National Plan of Integrated Airport Systems, 2024).

[1] FAA Order 1050.1G, FAA National Environmental Policy Act Implementing Procedures, was published on June 30th, 2025. Preparation for this Draft EA was completed pursuant to FAA Order 1050.1F, and there are no changes that affect the environmental analysis. Additionally, this EA was prepared pursuant to current Executive Orders and current case law.

FIGURE 1-1: AIRPORT LOCATION

In fiscal year (FY) 2023, the Airport had 102,793 total operations, no enplanements- the total number of passengers who board a commercial aircraft at an airport, and 383 based aircraft (Federal Aviation Administration, 2024).

The Airport is the busiest general aviation airport in the Commonwealth of Virginia. The Virginia Airport System Economic Impact Study determined that the Airport contributed more than 547 direct jobs and over $375 million to the local economy (Virginia Department of Aviation, 2018)The Airport has a terminal building, fixed base operator (FBO) hangars/buildings, and various corporate and general aviation hangars. The Airport has two runways: Runway 16L/34R is 6,200 feet long by 100 feet wide; Runway 16R/34L is 3,704 feet long by 75 feet wide.

Airport aircraft operations include corporate/business, general aviation, charter, and recreational flights. ***Table 1-1*** shows the FAA's Terminal Area Forecast (TAF) summarizing the Airport's forecast itinerant, local, and total operations from 2024 to 2030.

TABLE 1-1: AIRPORT OPERATIONS - FAA TERMINAL AREA FORECAST

Year	Itinerant Operations	Local Operations	Total Operations	Based Aircraft
2024	56,218	47,214	103,432	387
2025	56,540	47,537	104,077	392
2026	56,869	47,863	104,732	397
2027	57,203	48,192	105,395	402
2028	57,546	48,522	106,068	407
2029	57,899	48,855	106,754	412
2030	58,255	49,190	107,445	417

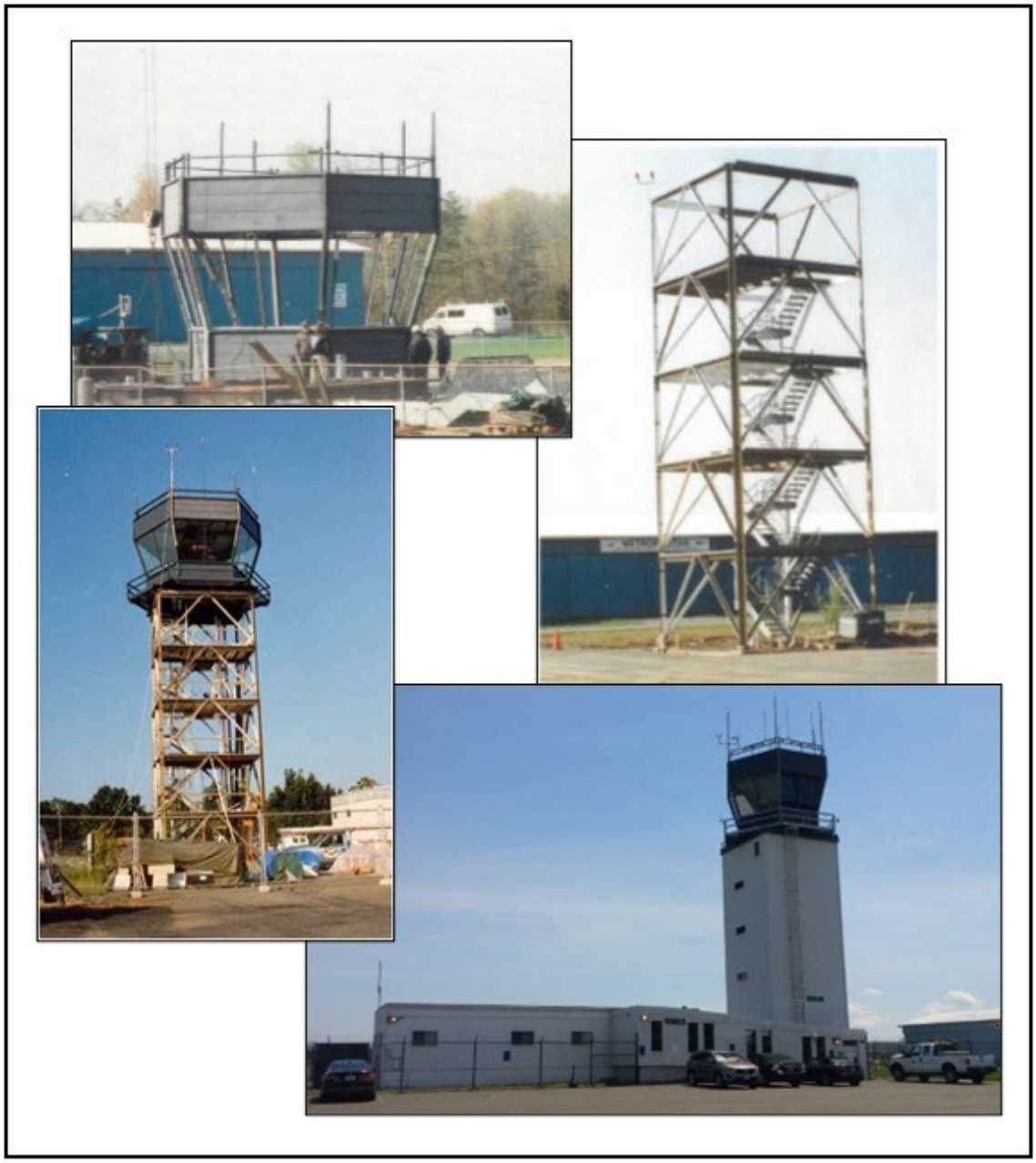
Source: FAA, 2024.

The existing ATCT is owned and maintained by the City. It holds a unique position among the Commonwealth's nine air traffic control towers, as it is the only Virginia general aviation (GA) airport with its own ATCT. The ATCT is staffed and operated by FAA personnel, ensuring safe and efficient air traffic management within the Airport's airspace. The ATCT was initially built in Centennial, Colorado, in the mid-1960s before being dismantled, transported to its current location at the Airport, and commissioned in 1991 (see ***Figure 1-2***). Despite its continued service, parts of the ATCT have aged considerably, with some components reaching 60 years old and beyond their expected useful life. This challenges the Airport's ongoing maintenance efforts to keep the ATCT operational and safe for air traffic control purposes.

1.2 PURPOSE AND NEED

The Purpose and Need establishes the justification for action by discussing the current issue and why it needs to be addressed. In addition, it establishes a basis upon which a reasonable range of alternatives can be determined.

FIGURE 1-2: ATCT RELOCATION CONSTRUCTION



Source: City of Manassas, 2023.

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The project's purpose is to improve the ATCT functional and operational capabilities provided to the Airport. The need to replace the ATCT is a combination of safety, operational, and infrastructure deficiencies. Below are the key reasons why the existing ATCT needs to be replaced. ***Figure 1-3*** shows recent pictures of the existing ATCT conditions.

- **Inadequate Height**: The ATCT's cab floor is 82 feet above ground level and is too low, which poses a safety concern. The current height affects the controllers' ability to maintain a proper line of sight with aircraft. As a result, aircraft may become difficult to spot in a timely manner, increasing the risk of incidents or incursions.[2]
- **Obstructed Line of Sight**: The current ATCT has challenges for controllers due to obstructed lines of sight. Over the years, tall trees west of the ATCT partially obstruct the view of incoming aircraft, making it challenging to detect and manage incoming traffic until they are very close to the Airport.
- **Limited Space in the ATCT Cab**: The existing ATCT cab (approximately 189 square feet) is too small to accommodate the necessary equipment and personnel comfortably. The lack of space can hinder the controllers' ability to manage air traffic efficiently and lead to decreased operational effectiveness.
- **Escalating Maintenance Costs**: The current ATCT has reached a point where its maintenance costs are increasing significantly. Aging infrastructure, equipment, and systems require frequent repairs and updates.
- **Inadequate HVAC Systems**: The air conditioning units in the ATCT are undersized for the equipment load they need to support. This results in constant operation, which consumes excessive energy and strains the equipment. This results in repeated maintenance and uncomfortable working conditions for the FAA controllers.
- **Security Concerns**: The parking area around the ATCT is not adequately secured. This poses a security risk, as unauthorized individuals could gain access to the ATCT and compromise the safety of the airspace and FAA personnel within the facility.
- **Inadequate Facilities**: The break room is too small and lacks sufficient space to meet the existing ATCT staff's operational needs. The existing ATCT also has small conference rooms and a cramped training room.
- **Structural Issues**: The ATCT cab has numerous leaks and cracks that allow water to enter. Additionally, it has issues with pests like bees and wasps infiltrating the workspace, which can pose safety and health risks to the ATCT controllers.

[2] Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take off of aircraft.

FIGURE 1-3: ATCT INFRASTRUCTURE CONCERNS

Source: City of Manassas, 2023.

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The City proposes to construct a replacement ATCT at the Airport to improve the functional and operational capabilities of the service provided by the FAA ATCT personnel. The replacement ATCT would meet the design policy described in FAA Job Order (JO) 6480.7E, Airport Traffic Control Tower (ATCT), and Terminal Radar Approach Control (TRACON) Design Policy, improving the safety of the ATCT and Airport users. A replacement ATCT with an appropriate height (i.e., up to 120 feet), improved line of sight, expanded cab space, upgraded HVAC systems, enhanced security, better facilities, and improved structural integrity would ensure the continued safe and efficient air traffic management at the Airport. After construction of the replacement ATCT is complete and the proper equipment is installed, tested, and operational, the existing ATCT would be demolished.

1.3 DOCUMENT ORGANIZATION

This EA is structured to follow the document format described in FAA Orders 1050.1F and 5050.4B. ***Table 1-2*** lists the EA's chapters and describes the information contained within each.

TABLE 1-2: DOCUMENT ORGANIZATION

Chapter	Description
Chapter 1: Purpose and Need	This chapter provides an overview of the Airport and discusses the purpose and need of the project.
Chapter 2: Proposed Action / Alternatives	This chapter describes the Proposed Action, No Action Alternative, and alternatives considered in this EA.
Chapter 3: Affected Environment / Environmental Consequences	This chapter presents an overview of the existing environment in the EA's study areas. It describes the potential effects of the Proposed Action and any alternatives carried forward on each environmental resource identified in FAA Order 1050.1F.
Chapter 4: Agency and Public Involvement	This chapter describes the coordination process with applicable local, state, and federal agencies, federally recognized Tribes, and the public's opportunity to comment on the EA.
Chapter 5: List of Preparers	This chapter lists the staff at the Authority and consulting associates who researched, wrote, reviewed, and documented the EA.
Chapter 6: References	This chapter identifies the reference materials used to prepare the EA.
Appendices	The appendices present relevant material, exhibits, and technical reports developed to prepare the EA.

Source: RS&H, 2023.

2
ALTERNATIVES

This chapter identifies, describes, compares, and evaluates the Proposed Action, reasonable alternatives, and the No Action.

The Manassas Regional Airport (HEF or Airport) Airport Traffic Control Tower (ATCT) is a City-owned facility. The existing HEF tower is a Hunt/AVCO tower facility with an existing cab size of approximately 189 square feet and a cab floor height of 82 feet above ground level (AGL). In the winter/spring of 2024, the FAA conducted a Siting Study for the ATCT. The 2024 FAA Siting Report describes the siting process, evaluation criteria for a replacement tower, an overview of all potential sites considered, a detailed evaluation of the primary site options, and conclusions and recommendations (see ***Appendix A*** for further details).

2.1 PROPOSED ACTION AND ALTERNATIVES CONSIDERED AND EVALUATED

The 2024 FAA Siting Report analyzed three alternative sites, including the Proposed Action site, for the replacement ATCT (see ***Figure 2-1***).[3] The locations were determined based on FAA Order 6480.4B guidance, *Airport Traffic Control Tower Siting Criteria*. According to the 2024 FAA Siting Report, visibility and impacts were assessed and documented to determine viable sites. The sites were identified based on FAA and Airport discussions and inputs on the advantages and disadvantages of each site.

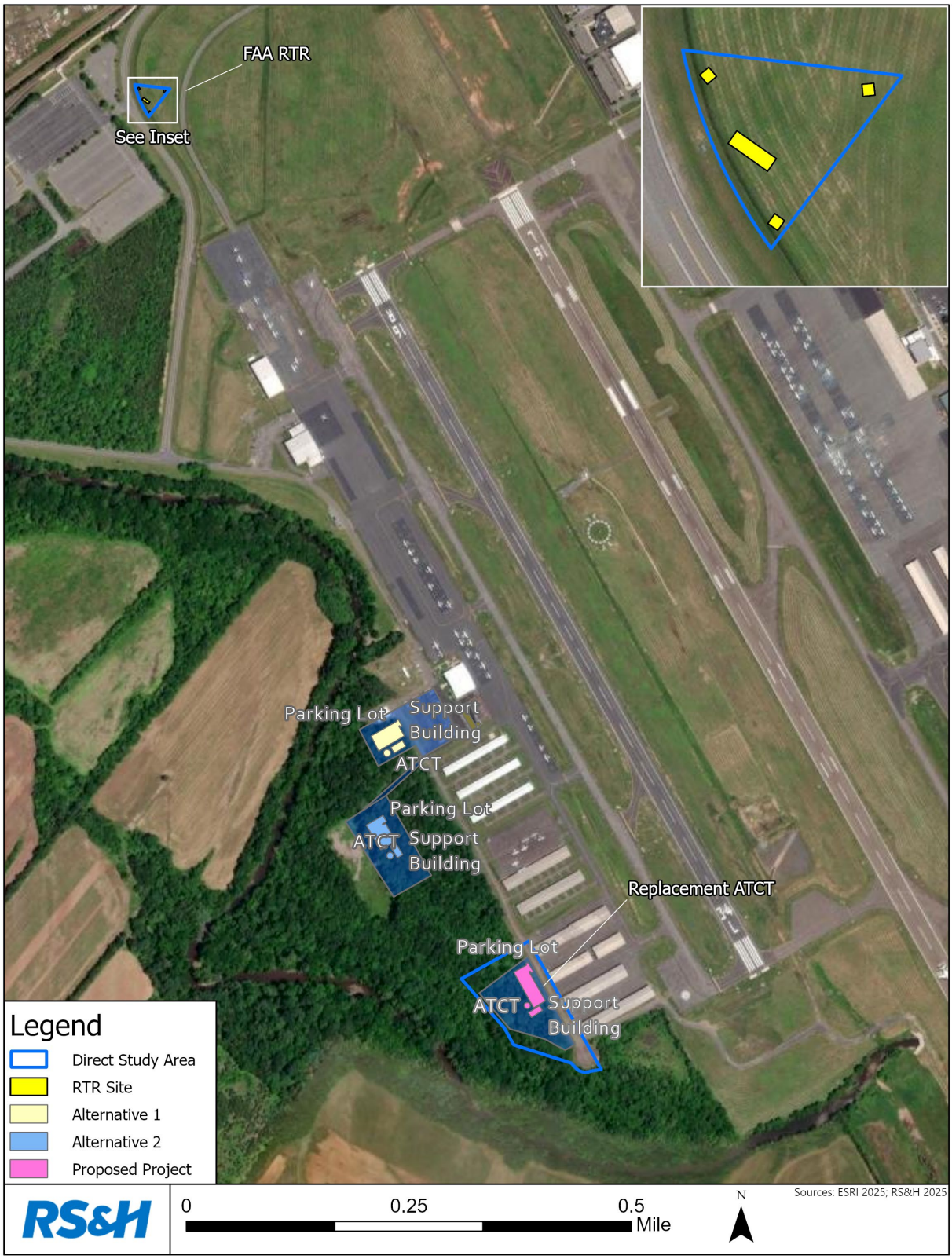
The FAA and Airport management representatives met virtually via the Virtual Immersive Siting Tower Assessment (VISTA) process on February 20-21, 2024, and February 23, 2024, to participate in ATCT siting activities. The participants followed VISTA Memo Version 1.1, dated October 16, 2023, to determine viable/preferred ATCT sites for a potential new ATCT. Additional information regarding the 2024 FAA Siting Study is contained in ***Appendix A***.

This EA considers the Proposed Action and two alternative sites, Site #1 and Site #2 (see ***Figure 2-1***). Each site includes a replacement ATCT, support building, and employee parking area (see ***Section 2.2.2*** for additional descriptions of each site's project components).

The Proposed Action (i.e., 2024 FAA Siting Study Site #3) and two alternative sites meet the Purpose and Need described in ***Chapter 1*** to improve the functional and operational capabilities of the service provided by the FAA Air Traffic Control (ATC) Staff at the Airport. The ATCT controller's line of sight and ability to safely control movements on the airfield and in the traffic pattern were the controlling factors regarding site viability. Each site is further described in ***Section 2.2.2***.

[3] Note: Only the replacement ATCT sites were evaluated and not the connected actions (vehicle parking or support building). The blue shaded areas in Figure 2-1 represent the FAA requested 2-acre minimum for the layout of a new ATCT.

FIGURE 2-1: PROPOSED ACTION AND ALTERNATIVES



2.1.1 No Action Alternative

Under the No Action Alternative, the Proposed Action (i.e., a replacement ATCT) would not be constructed. The Airport would continue to manage aircraft operations with the existing ATCT. The No Action Alternative would not satisfy the Purpose and Need of the project by providing improved functional and operational ATCT capabilities associated with the currently deficient ATCT. Under the No Action Alternative, the existing ATCT would continue to have an inadequate height with obstructions within the controller's line of sight, limited cab space, increased maintenance costs with potential incremental improvements based on available funding, inadequate HVAC, and security and structural concerns. These functional and operational issues could lead to the decommissioning of the existing ATCT if they are not addressed.

2.1.2 Replacement ATCT

As previously described, three replacement ATCT sites were analyzed during the development of the 2024 FAA Siting Study (Site #1, Site #2, and Site #3). Based on the findings of the Siting Study, Site #3 is the Proposed Action for this EA.

The replacement ATCT components (i.e., replacement ATCT, base building, and ATC Staff parking lot) are the same for each site (see ***Figure 2-1***). Each replacement ATCT site includes the following:

- Clearing and grubbing of Airport property containing vegetation and trees for a replacement ATCT (including clearing and grubbing for line-of-sight purposes);
- Construction and operation of a minimum 2-acre site for replacement of 111- to 120-foot ATCT and support facilities (approximately 130 feet to the top of the antennas with 550 square feet of cab space).
- Construction of an FAA Remote Transmitter Receiver (FAA RTR) (i.e., up to three antenna towers, as necessary, and an equipment building)
- Construction of ATCT supporting facilities, including:
    - a 0.28-acre parking lot for the ATC Staff working at the replacement ATCT (estimated maximum 10 ATCT personnel (staff and trainees) on a weekday, daytime shift).
    - an approximate 25-foot-long sidewalk to the replacement ATCT.
    - a 100-square-foot utility pad (including a possible enclosure for an emergency generator).
    - Connection to utilities (e.g., water, sewer, power, and communications) to service the replacement ATCT and link the replacement ATCT to the airfield lighting.
    - Construction of a security fence (including a vehicle access gate) to secure and provide access to the replacement ATCT.

- Relocation of the rotating beacon to the top of the replacement ATCT.[4]
- Demolition of the existing ATCT.

The replacement ATCT would include a control cab on top of a functional shaft.[5] The control cab would be designed to have five authorized ATC Staff positions. Vehicular access to the replacement ATCT site would be via a connection to Observation Road. ATC Staff would park in a proposed new parking lot, and a new sidewalk would provide access from the parking lot to the replacement ATCT.

The replacement ATCT could include a base building. A base building can further support ATCT's functional space, typically used to house the equipment necessary to support the operational needs of the ATCT, including space for administrative and training functions. A base building can have the following attributes:

- Flexibility in space arrangement.
- Potential for future expansion.
- HVAC units are used to relieve potentially crowded conditions in interior mechanical spaces.
- More convenient, safe, and efficient circulation of people.

The existing ATCT would remain in operation during the construction of the replacement ATCT. Construction of the replacement ATCT would not create line-of-site obstructions to critical points of the airfield's movement area from the existing ATCT. Operations from the replacement ATCT would begin after construction is complete and the proper equipment is installed and tested. At that time, the existing ATCT would be demolished. Removing the existing ATCT would not create line-of-site obstructions to critical points of the airfield's movement area from the replacement ATCT.

The construction of the replacement ATCT would begin in 2026 and be operational in 2028. The contractor's staging, vehicle parking, and stockpile/material storage areas are all located within the ATCT project site.

2.1.2.1 Site 1 (Alternative 1)

Site 1 is about 1,100 feet west of the Runway 16R-34L centerline (38.72061, -77.52073). Site 1 would include an approximate 120-foot access road connecting the FAA ATC Staff parking lot to Observation Road (see ***Figure 2-1***).

Site 1 was reviewed and assessed in the FAA 2024 Siting Report. Site 1 is located behind the existing ATCT and is oriented to the Local Control (LC) position facing southeast. Site 1 has

[4] According to the FAA, ATCT Sites 1 and 3 (i.e., Proposed Action) penetrate the transitional surface as described in 14 CFR Part 77.19(e); therefore the ATCT would need to be lighted in accordance with FAA AC 70/7460-1M.

[5] An ATCT's functional shaft can include space for mechanical and electronic equipment, cable routing to the tower cab, offices, break room, meeting space, training room, etc.

improved visibility over the existing ATCT, has established access and utilities, and has nearby parking. However, Site 1 is not centrally located on Airport property. Based on ***Figure 2-1***, the Site 1 location involves less tree clearing than both Alternative 2 and the Proposed Action. Trees located just off the Airport property would obscure the controller's view of the Runway 34R runup area, Taxiway K extension, and portions of the west side of Runway 34R. Also, Site 1 is located in an area where other potential future Airport development and construction is shown on the ALP (see ***Figure 2-2***). In addition, the maximum distance to the farthest point on all runways and taxiways is 4,556 feet (to Runway 34R end), which is longer than Site 3. The structure at Site 1 must be lighted in accordance with FAA Advisory Circular 70/7460-1M, Obstruction Marking and Lighting. Therefore, Site 1 was not carried forward for further analysis in the EA.

2.1.2.2 Site 2 (Alternative 2)

Site 2 is about 1,250 feet west of the Runway 16R-34L centerline (38.71931, -77.52068). Site 2 includes an approximate 400-foot access road to connect the FAA ATC Staff parking lot to Observation Road (see ***Figure 2-1***).

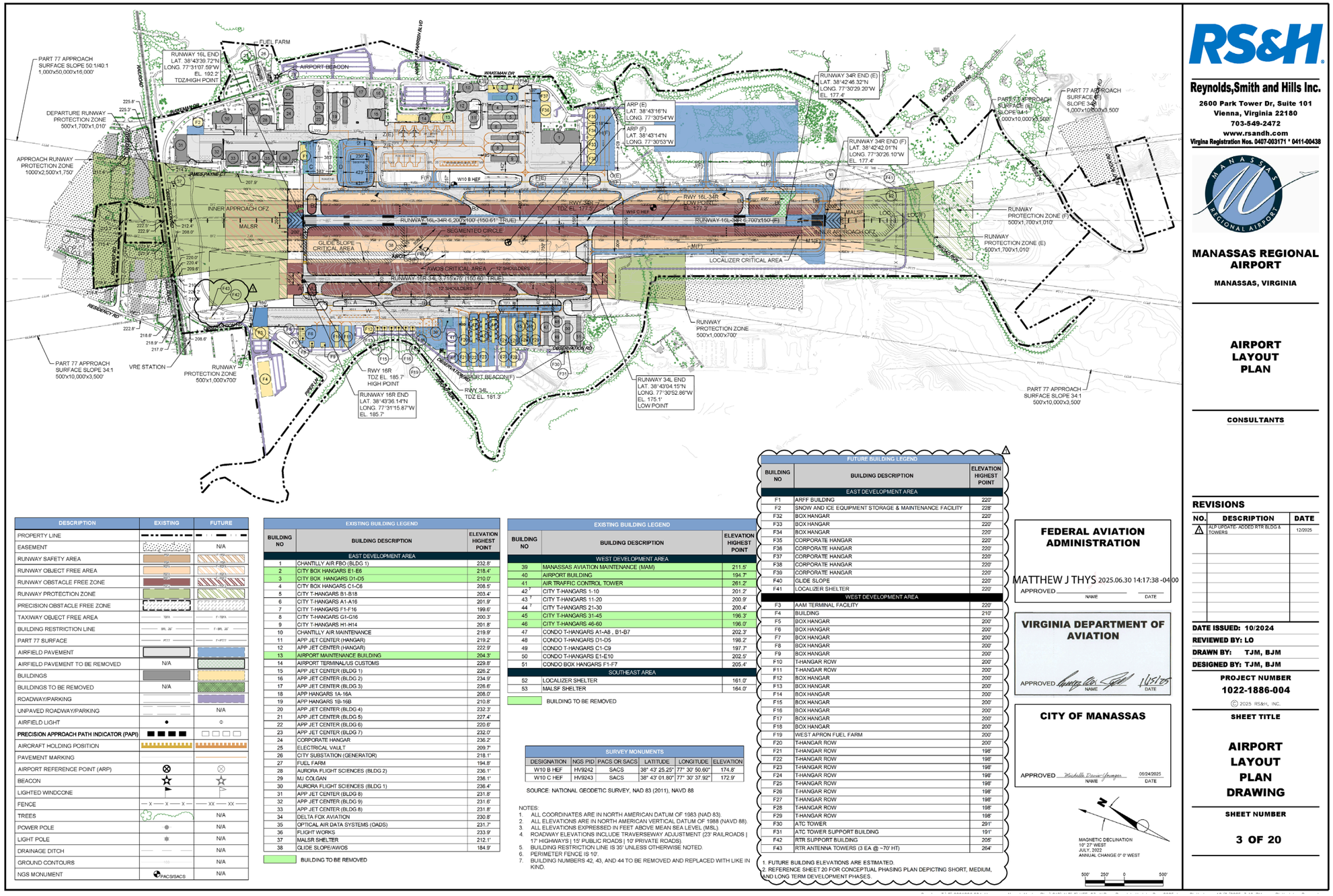
Site 2 was reviewed and assessed in the FAA 2024 Siting Report. During the Site 2's assessment, the FAA Air Traffic Management (FAA ATM) described that a portion of the Runway 34R runup area was blocked, a portion of Taxiway W and the west side of Taxiway K could not be seen, and there was a distance issue too (about 4,300 feet is the maximum distance to the farthest point on all runways and taxiways). A potential future runway extension, shown on the ALP, would be obstructed if the trees grow anymore, and the line of sight (LOS) would be unacceptable. The FAA ATM also described that the Runway 34L runup block is not visible. The FAA ATM concluded that Alternative 2 had too many LOS conflicts on the airfield and was deemed not viable (see ***Appendix A*** for further details). Therefore, Site 2 was not carried forward for further analysis in the EA.

2.1.2.3 Site 3 (Proposed Action)

The Proposed Action (2024 FAA Siting Study Site #3) is about 980 feet west of the Runway 16R-34L centerline (38.71741, -77.51845).

The Proposed Action is adjacent to the approach end of Runway 34L and is oriented to the LC position facing south. It is centrally located in the middle of the Airport and the middle of Runway 34R and Runway 16L. This site has an improved LOS to a potential future runway extension, as shown on the ALP, as well as Taxiway C and Taxiway Z on the north side, the terminal, and the ramp. Compared to Site 1, it is located further away from buildings and hangars, and its remote location adds extra security.

FIGURE 2-2: AIRPORT LAYOUT PLAN



DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		
EASEMENT		N/A
RUNWAY SAFETY AREA	RSA	F-RSA
RUNWAY OBJECT FREE AREA	ROFA	F-ROFA
RUNWAY OBSTACLE FREE ZONE	ROFZ	F-ROFZ
RUNWAY PROTECTION ZONE	RPZ	F-RPZ
PRECISION OBSTACLE FREE ZONE	POFZ	F-POFZ
TAXIWAY OBJECT FREE AREA	TOFA	F-TOFA
BUILDING RESTRICTION LINE	BRL 20°	F-BRL 20°
PART 77 SURFACE	PT77	F-PT77
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED	N/A	
BUILDINGS		
BUILDINGS TO BE REMOVED	N/A	
ROADWAY/PARKING		
UNPAVED ROADWAY/PARKING		N/A
AIRFIELD LIGHT		
PRECISION APPROACH PATH INDICATOR (PAPI)		
AIRCRAFT HOLDING POSITION		
PAVEMENT MARKING		
AIRPORT REFERENCE POINT (ARP)		
BEACON		
LIGHTED WINDCONE		
FENCE	— X — X — X —	— XX — XX —
TREES		N/A
POWER POLE		N/A
LIGHT POLE		N/A
DRAINAGE DITCH		N/A
GROUND CONTOURS	100	N/A
NGS MONUMENT	PACS/SACS	N/A

EXISTING BUILDING LEGEND

BUILDING NO	BUILDING DESCRIPTION	ELEVATION HIGHEST POINT
	EAST DEVELOPMENT AREA	
1	CHANTILLY AIR FBO (BLDG 1)	232.8'
2	CITY BOX HANGARS E1-E6	218.4'
3	CITY BOX HANGARS D1-D5	210.0'
4	CITY BOX HANGARS C1-C6	208.5'
5	CITY T-HANGARS B1-B18	203.4'
6	CITY T-HANGARS A1-A16	201.9'
7	CITY T-HANGARS F1-F16	199.6'
8	CITY T-HANGARS G1-G16	200.3'
9	CITY T-HANGARS H1-H14	201.8'
10	CHANTILLY AIR MAINTENANCE	219.9'
11	APP JET CENTER (HANGAR)	219.2'
12	APP JET CENTER (HANGAR)	222.9'
13	AIRPORT MAINTENANCE BUILDING	204.3'
14	AIRPORT TERMINAL/US CUSTOMS	229.8'
15	APP JET CENTER (BLDG 1)	226.2'
16	APP JET CENTER (BLDG 2)	234.9'
17	APP JET CENTER (BLDG 3)	226.6'
18	APP HANGARS 1A-16A	208.0'
19	APP HANGARS 1B-16B	210.8'
20	APP JET CENTER (BLDG 4)	232.3'
21	APP JET CENTER (BLDG 5)	227.4'
22	APP JET CENTER (BLDG 6)	220.6'
23	APP JET CENTER (BLDG 7)	232.0'
24	CORPORATE HANGAR	236.2'
25	ELECTRICAL VAULT	209.7'
26	CITY SUBSTATION (GENERATOR)	218.1'
27	FUEL FARM	194.8'
28	AURORA FLIGHT SCIENCES (BLDG 2)	236.1'
29	MJ COLGAN	236.1'
30	AURORA FLIGHT SCIENCES (BLDG 1)	236.4'
31	APP JET CENTER (BLDG 8)	231.8'
32	APP JET CENTER (BLDG 9)	231.6'
33	APP JET CENTER (BLDG 8)	231.8'
34	DELTA FOX AVIATION	230.8'
35	OPTICAL AIR DATA SYSTEMS (OADS)	231.7'
36	FLIGHT WORKS	233.9'
37	MALSR SHELTER	212.1'
38	GLIDE SLOPE/AWOS	184.9'

BUILDING TO BE REMOVED

EXISTING BUILDING LEGEND

BUILDING NO	BUILDING DESCRIPTION	ELEVATION HIGHEST POINT
	WEST DEVELOPMENT AREA	
39	MANASSAS AVIATION MAINTENANCE (MAM)	211.5'
40	AIRPORT BUILDING	194.7'
41	AIR TRAFFIC CONTROL TOWER	261.2'
42	CITY T-HANGARS 1-10	201.2'
43	CITY T-HANGARS 11-20	200.9'
44	CITY T-HANGARS 21-30	200.4'
45	CITY T-HANGARS 31-45	196.3'
46	CITY T-HANGARS 46-60	196.0'
47	CONDO T-HANGARS A1-A8 , B1-B7	202.3'
48	CONDO T-HANGARS D1-D5	198.2'
49	CONDO T-HANGARS C1-C9	197.7'
50	CONDO T-HANGARS E1-E10	202.5'
51	CONDO BOX HANGARS F1-F7	205.4'
	SOUTHEAST AREA	
52	LOCALIZER SHELTER	161.0'
53	MALSF SHELTER	164.0'

BUILDING TO BE REMOVED

SURVEY MONUMENTS

DESIGNATION	NGS PID	PACS OR SACS	LATITUDE	LONGITUDE	ELEVATION
W10 B HEF	HV9242	SACS	38° 43' 25.25"	77° 30' 50.60"	174.8'
W10 C HEF	HV9243	SACS	38° 43' 01.80"	77° 30' 37.92"	172.9'

SOURCE: NATIONAL GEODETIC SURVEY, NAD 83 (2011), NAVD 88

NOTES:
1. ALL COORDINATES ARE IN NORTH AMERICAN DATUM OF 1983 (NAD 83).
2. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
3. ALL ELEVATIONS EXPRESSED IN FEET ABOVE MEAN SEA LEVEL (MSL).
4. ROADWAY ELEVATIONS INCLUDE TRAVERSEWAY ADJUSTMENT (23' RAILROADS | 17' HIGHWAYS | 15' PUBLIC ROADS | 10' PRIVATE ROADS).
5. BUILDING RESTRICTION LINE IS 35' UNLESS OTHERWISE NOTED.
6. PERIMETER FENCE IS 10'.
7. BUILDING NUMBERS 42, 43, AND 44 TO BE REMOVED AND REPLACED WITH LIKE IN KIND.

FUTURE BUILDING LEGEND

BUILDING NO	BUILDING DESCRIPTION	ELEVATION HIGHEST POINT
	EAST DEVELOPMENT AREA	
F1	ARFF BUILDING	220'
F2	SNOW AND ICE EQUIPMENT STORAGE & MAINTENANCE FACILITY	228'
F32	BOX HANGAR	220'
F33	BOX HANGAR	220'
F34	BOX HANGAR	220'
F35	CORPORATE HANGAR	220'
F36	CORPORATE HANGAR	220'
F37	CORPORATE HANGAR	220'
F38	CORPORATE HANGAR	220'
F39	CORPORATE HANGAR	220'
F40	GLIDE SLOPE	220'
F41	LOCALIZER SHELTER	220'
	WEST DEVELOPMENT AREA	
F3	AAM TERMINAL FACILITY	220'
F4	BUILDING	210'
F5	BOX HANGAR	200'
F6	BOX HANGAR	200'
F7	BOX HANGAR	200'
F8	BOX HANGAR	200'
F9	BOX HANGAR	200'
F10	T-HANGAR ROW	200'
F11	T-HANGAR ROW	200'
F12	BOX HANGAR	200'
F13	BOX HANGAR	200'
F14	BOX HANGAR	200'
F15	BOX HANGAR	200'
F16	BOX HANGAR	200'
F17	BOX HANGAR	200'
F18	BOX HANGAR	200'
F19	WEST APRON FUEL FARM	200'
F20	T-HANGAR ROW	200'
F21	T-HANGAR ROW	198'
F22	T-HANGAR ROW	198'
F23	T-HANGAR ROW	198'
F24	T-HANGAR ROW	198'
F25	T-HANGAR ROW	198'
F26	T-HANGAR ROW	198'
F27	T-HANGAR ROW	198'
F28	T-HANGAR ROW	198'
F29	T-HANGAR ROW	198'
F30	ATC TOWER	291'
F31	ATC TOWER SUPPORT BUILDING	191'
F42	RTR SUPPORT BUILDING	205'
F43	RTR ANTENNA TOWERS (3 EA @ ~70' HT)	264'

1. FUTURE BUILDING ELEVATIONS ARE ESTIMATED.
2. REFERENCE SHEET 20 FOR CONCEPTUAL PHASING PLAN DEPICTING SHORT, MEDIUM, AND LONG TERM DEVELOPMENT PHASES.

FEDERAL AVIATION ADMINISTRATION
MATTHEW J THYS 2025.06.30 14:17:38 -04'00'
APPROVED _____ NAME _____ DATE

VIRGINIA DEPARTMENT OF AVIATION
APPROVED _____ NAME 11/5/25 DATE

CITY OF MANASSAS
APPROVED _____ NAME 06/24/2025 DATE

MAGNETIC DECLINATION
10° 27' WEST
JULY, 2022
ANNUAL CHANGE 0° 0' WEST

500' 250' 0 500'

RS&H
Reynolds,Smith and Hills Inc.
2600 Park Tower Dr, Suite 101
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703-549-2472
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Virgina Registration Nos. 0407-003171 * 0411-00438

MANASSAS REGIONAL AIRPORT
MANASSAS, VIRGINIA

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE
1	ALP UPDATE: ADDED RTR BLDG & TOWERS	12/2025

DATE ISSUED: 10/2024
REVIEWED BY: LO
DRAWN BY: TJM, BJM
DESIGNED BY: TJM, BJM
PROJECT NUMBER
1022-1886-004

SHEET TITLE
AIRPORT LAYOUT PLAN DRAWING
SHEET NUMBER
3 OF 20

The Proposed Action is located at the threshold of Runway 34L at the north third of the Airport. ATC Staff would be able to see the lineup of aircraft clearly on the correct runway. The Proposed Action's location would require fewer trees to be removed compared with Site 2, but more than Site 1. In addition, no future development or construction is planned at this site. The 2024 FAA Siting Study does note that utilities would need to be brought in from about 200 yards to existing connections. In addition, the maximum distance to the farthest point on all runways and taxiways is 3,746 feet (to Runway 16L end), which is shorter than Site 1 and Site 2 (see ***Appendix A*** for further details). The structure at Site 3 must be lighted in accordance with FAA Advisory Circular 70/7460-1M, Obstruction Marking and Lighting. Site 3 was carried forward for detail analysis in the EA as the preferred alternative based on the analysis and recommendation in the Siting Study.

2.2 FAA RTR TOWER SITING ALTERNATIVES AND EVALUATION

Due to the height of the proposed replacement ATCT, the FAA RTR equipment[6] that is currently located on top of the existing ATCT, is unable to be located atop the proposed replacement ATCT because it would penetrate the Federal Aviation Regulation (FAR) Part 77 airspace[7] for the safe movement of aircraft operations. Therefore, FAA RTR tower siting alternatives and evaluation were conducted. FAA RTR site locations were identified based on two criteria:

- Geographic: The site must be limited to existing Airport property.
- Line of Sight: Each potential location must ensure an unobstructed line of sight to the proposed replacement ATCT site (Site 3, preferred alternative, evaluated in ***Section 2.1***).

Using this criterion, the Proposed Action FAA RTR site and five alternative FAA RTR sites were identified (see ***Figure 2-3***).

The following evaluation criteria were applied to each proposed FAA RTR tower site to identify which site would be the connected action to the Proposed Action:

- Safety: The site must be safely situated away from aircraft operations; specifically, it must be located beyond potential jet engine blast areas.
- Compliance with ALP and Future Growth: The site must align with the current ALP (i.e., not located in FAR Part 77 imaginary surfaces) and must not impede or restrict planned future airport development.
- Avoids 100-year Floodplain: The site must avoid development within the 100-year floodplain to comply with environmental regulations (i.e., Executive Order 11988, Floodplain Management).

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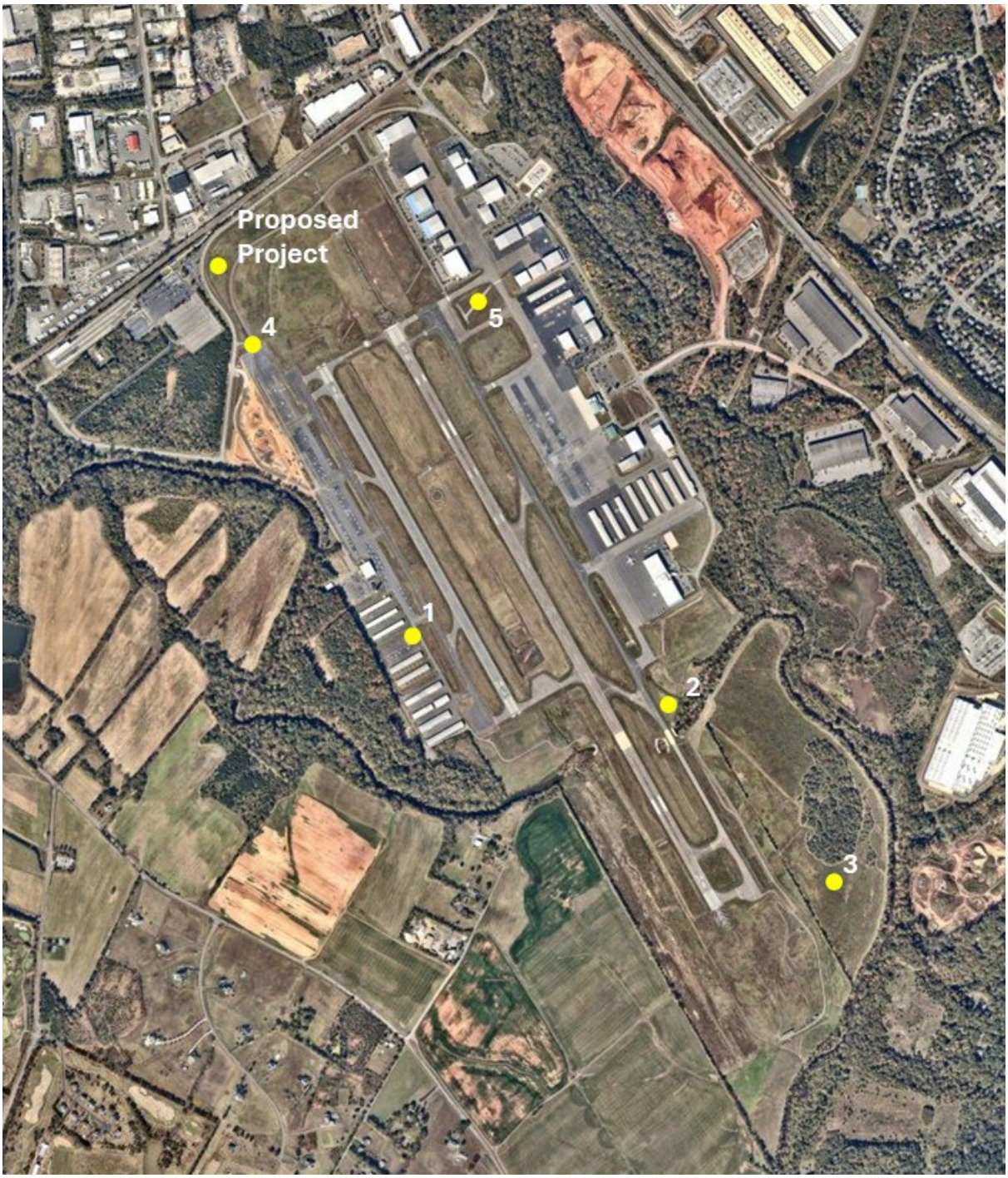
[6] FAA Remote Transmitter/Receivers (RTR) extend the communication range of air traffic control towers. FAA RTRs provide ground-to-ground communications for air traffic control specialists to issue departure authorizations and acknowledge instrument flight rules cancellations or departure/landing times to pilots.

[7] Federal Aviation Regulation (FAR) Part 77 establishes standards and notification requirements for objects affecting navigable airspace. FAR Part 77 allows the FAA to identify potential aeronautical hazards in advance, thereby preventing or minimizing adverse impacts on the safe and efficient use of navigable airspace.

FIGURE 2-3: RTR TOWER SITE ALTERNATIVES



Note: The yellow dots show the proposed location of the RTR site alternatives described in Section 2.2.

2.2.1 Proposed Action's FAA RTR Site

The Proposed Action's FAA RTR site location meets all site selection criteria, including being fully compatible with the FAA ALP and avoiding the 100-year floodplain. From a safety perspective, the site is appropriately situated away from the jet blast area

2.2.1.1 FAA RTR Alternative 1

FAA RTR Alternative 1 avoids the 100-year floodplain. However, it presents operational and long-term challenges: it is incompatible with the ALP because it restricts future development, and it poses safety risks from jet engine blast. Compared to the Proposed Action FAA RTR site, FAA RTR Alternative 1 was not considered further.

2.2.1.2 FAA RTR Alternative 2

FAA RTR Alternative 2 is compatible with future development, as shown on the ALP. Additionally, the location is not near a jet engine blast area. However, Site 2 does not avoid the 100-year floodplain. Compared to the Proposed Action FAA RTR site, FAA RTR Alternative 2 was not considered further.

2.2.1.3 FAA RTR Alternative 3

While FAA RTR Alternative 3 is favorable by providing ALP compliance and jet engine blast avoidance, it does not avoid the 100-year floodplain. Compared to the Proposed Action FAA RTR site, FAA RTR Alternative 3 was not considered further.

2.2.1.4 FAA RTR Alternative 4

FAA RTR Alternative 4 avoids affecting the 100-year floodplain; however, it is incompatible with future development on the ALP and is near a jet engine blast area. Compared to the Proposed Action FAA RTR site, FAA RTR Alternative 4 was not considered further.

2.2.1.5 FAA RTR Alternative 5

Although FAA RTR Alternative 5 avoids the 100-year floodplain, it presents safety and planning concerns. The location is not safely situated for aircraft operations due to jet engine blast generated by aircraft turning north and south from Taxilanes C and D. Furthermore, FAA RTR Alternative 5 is incompatible with the ALP because its placement could restrict future airport development. Compared to the Proposed Action FAA RTR site, Site 5 was not considered further.

2.3 ALTERNATIVES RETAINED FOR DETAILED ANALYSIS

Based on the description and location of the Proposed Action and reasonable alternatives to achieve the project's purpose and the 2024 FAA Siting Study analysis, the FAA ATM recommended that the Proposed Action (Site 3) be retained for further environmental analysis

in ***Chapter 3***. In addition, the Proposed Action's RTR site is a connected action and is also retained for further environmental analysis in ***Chapter 3***.

As previously described, the EA retains the No Action Alternative for environmental baseline comparative purposes to comply with FAA Order 1050.1F.

3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment and evaluates the human and environmental consequences of the alternatives discussed in ***Chapter 2*** on 14 environmental impact categories defined by FAA (2015) Order 1050.1F. As described in ***Section 2.2.1***, the No Action Alternative is required to be analyzed in further detail, as it provides a baseline comparison for potential impacts from the Proposed Action.

Project Study Areas

Per guidance within the FAA *1050.1F Desk Reference,* Section I.1.1, Environmental Impact Categories,[8] a study area can vary based on the impact category being analyzed (Federal Aviation Administration, 2023). For this EA, the Direct Study Area encompasses two non-continuous areas with approximately 3.9 acres of Airport property associated with clearing/grubbing for the proposed replacement ATCT, and 0.3-acre for the location of the FAA RTR (see ***Figure 3-1***). The Direct Study Area (totaling 4.2 acres) includes environmental resources that could be directly affected by the construction of the Proposed Action. The Indirect Study Area (see ***Figure 3-1***) encompasses approximately 1,690 acres. It is based on 2020 LiDAR data overlaid on aerial imagery, where the proposed ATCT replacement would be visible from the ground. The Indirect Study Area addresses the resource categories that could be indirectly affected by the Proposed Action, such as impacts on air quality, biological resources, noise-sensitive land uses, socioeconomics, historic and cultural resources, and visual resources. Collectively, the Direct Study Area and Indirect Study Area are referred to as the "Project Study Areas."

Soil Boring Area

To assess subsurface conditions at the proposed ATCT location, a geotechnical survey with soil borings was conducted on 1 acre of the Direct Study Area (Replacement ATCT), referred to as the Soil Boring Area (see ***Figure 3-2***). To provide drill access, trees were cleared in the Soil Boring Area on March 24 and March 29, 2025; stumps were left in place, while branches and logs were mulched and spread across the ground. No grading or earth-moving activities were performed. The geotechnical survey determined that the Soil Boring Area is generally suitable for ATCT construction (Engineering & Materials Technologies, Inc., 2025).

Following the survey, existing conditions for the Direct Study Area (Replacement ATCT) equate to 1 acre of cleared trees, 2 acre of remaining forest, and 0.9-acre of paved and/or graded surfaces. Under the No Action Alternative, the trees would regrow within the Soil Boring Area. Under the Proposed Action, all tree stumps would be grubbed and debris removed within the Soil Boring Area.

[8] The Desk Reference provides explanatory guidance for environmental impact analysis to comply with the National Environmental Policy Act of 1969, U.S. DOT Order 5610.1C (Procedures for Considering Environmental Impacts), and FAA Order 1050.1F (Environmental Impacts: Policies and Procedures).

FIGURE 3-1: PROJECT STUDY AREAS

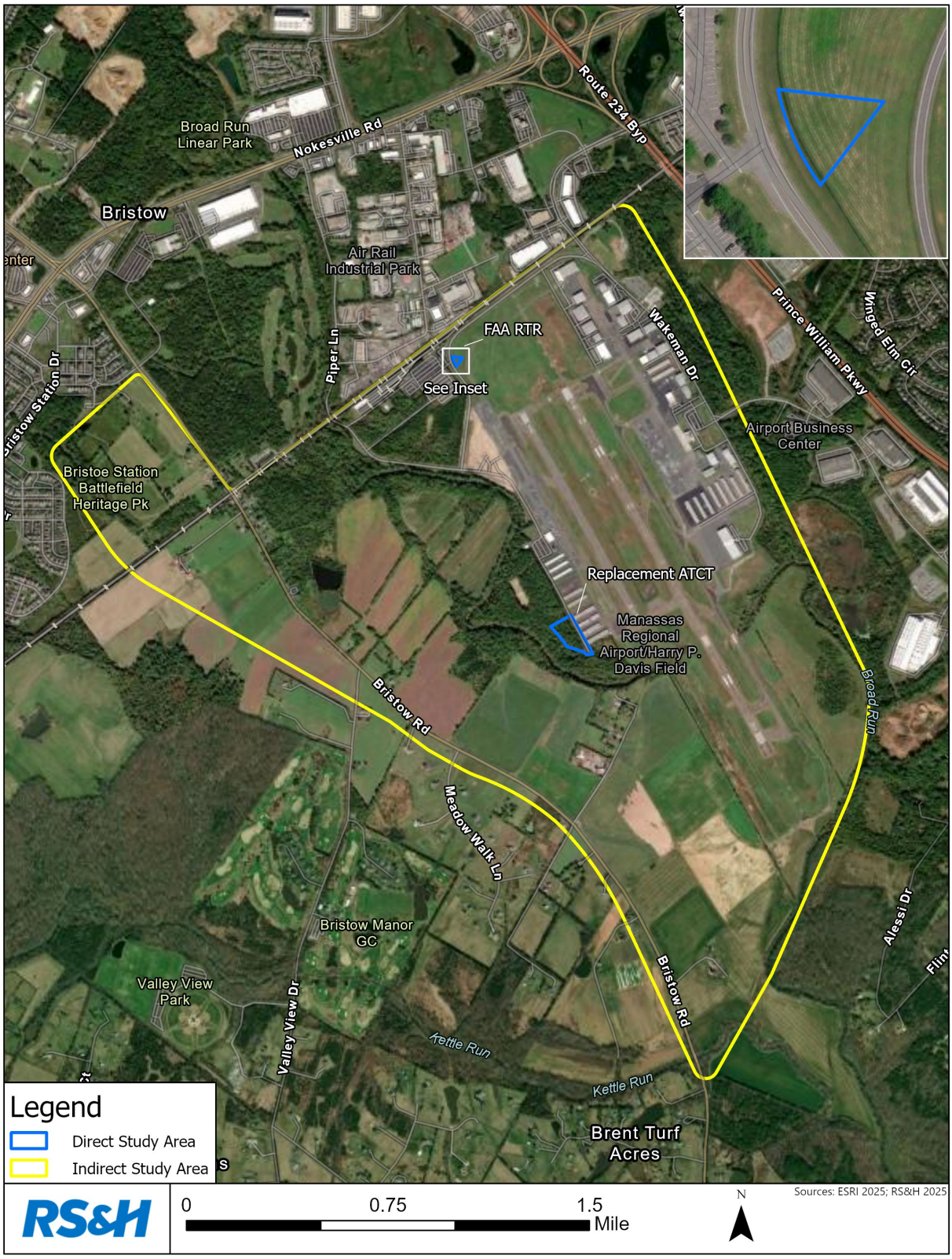


FIGURE 3-2: PROJECT STUDY AREAS AND SOIL BORING AREA

Environmental Impact Categories Potentially Affected

The following environmental impact categories identified in FAA Order 1050.1F have the potential to be affected by the Proposed Action, and are evaluated in detail in this chapter:

- Air Quality (***Section 3.2.1***)
- Biological Resources (***Section 3.2.2***)
- Climate (***Section 3.2.3***)
- Coastal Resources (***Section 3.2.4***)
- Department of Transportation Act, Section 4(f) (***Section 3.2.5***)
- Farmlands (***Section 3.2.6***)
- Hazardous Materials, Solid Waste, and Pollution Prevention (***Section 3.2.7***)
- Historical, Architectural, Archaeological, and Cultural Resources (***Section 3.2.8***)
- Natural Resources and Energy Supply (***Section 3.2.9***)
- Noise and Noise Compatible Land Use (***Section 3.2.10***)
- Socioeconomics and Children's Environmental Health and Safety (***Section 3.2.11***)
- Visual Effects (***Section 3.2.12***)
- Water Resources (***Section 3.2.13***)

As per FAA Order 1050.1F, and FAA Order 5050.4B, the analysis of each resource category includes the following:

- **Affected Environment**: describes the existing natural, ecological, cultural, social, and economic conditions that could be affected by the Proposed Action.
- **Environmental Consequences**: evaluates the human and environmental consequences of the No Action Alternative and the Proposed Action. This section also describes the potential impacts when considered with other reasonably foreseeable future actions.
- **Significance Threshold and Conclusion**: Significance thresholds for each resource category described in FAA Order 1050.1F, Exhibit 4-1, aid in the analysis of the impacts associated with the Proposed Action compared to the impact with the No Action Alternative. It is based on the information known at the time of this EA's preparation.
- **Mitigation Measures**: measures to avoid, minimize, or mitigate potential impacts.

Data used to determine the affected environment was collected by reviewing existing documentation provided by the Airport Sponsor, public databases, consulting with agencies with specific knowledge of a resource category, and conducting field investigations.

Environmental Impact Categories Not Affected

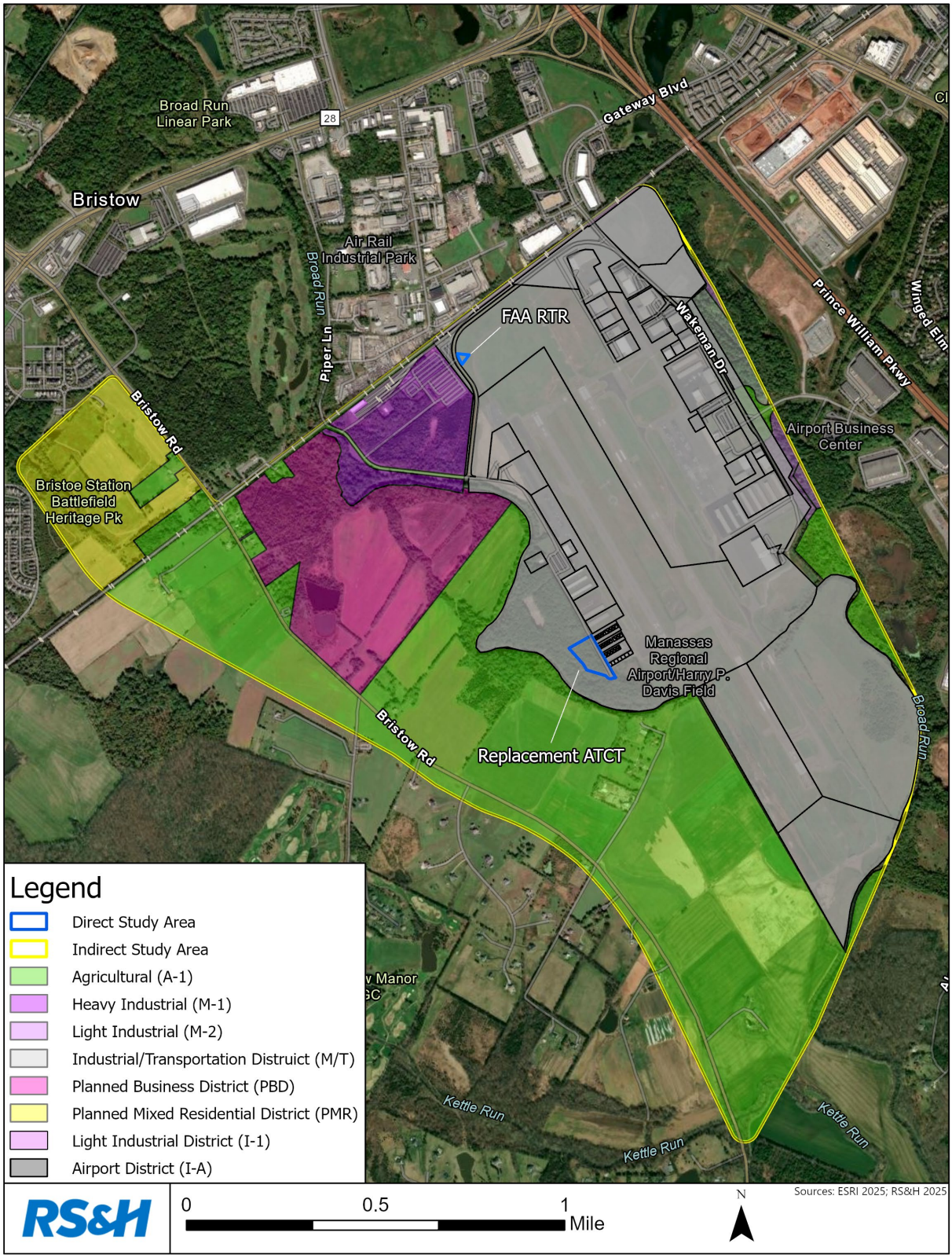
The following environmental impact categories identified in FAA Order 1050.1F would not be affected by the Proposed Action, as they are not present in the Direct Study Area and Indirect Study Area, or the Proposed Action does not have the potential to affect those resources:

- **Land Use**: As shown in ***Figure 3-3***, the City of Manassas Zoning Map (2024) identifies the Direct Study Area as being within the Airport District, permitting and using it for airport and related business activities (City of Manassas, 2023). The Proposed Action would not result in a change in land use and is consistent with the Airport District zoning designation. Land use would remain the same under the No Action Alternative. Therefore, the No Action Alternative and the Proposed Action would not affect land use.
- **Water Resources, Wild and Scenic Rivers**: According to the U.S. Department of the Interior National Park Service (2024), the nearest river listed in the Nationwide Rivers Inventory is the Bull Run tributary of the Occoquan River, located over 5 miles north of the Indirect Study Area. White Clay Creek is the nearest Wild and Scenic River segment, located 110 miles northeast of the Indirect Study Area (U.S. Department of Interior, 2024). Therefore, the No Action Alternative and Proposed Action would not affect Wild and Scenic Rivers.

3.1 NO ACTION ALTERNATIVE ENVIRONMENTAL ANALYSIS

Under the No Action Alternative, the construction and operation of the Proposed Action (i.e., replacement ATCT) would not occur. The No Action Alternative would not exclude other planned development at the Airport. The No Action Alternative would also assume incremental improvements to the existing ATCT based on available funding for it to remain operational while still operating under the remaining deficiencies, as deficient elements are being addressed. Alternatively, the No Action Alternative would eventually result in the potential loss of the ATCT facility if deficiencies cannot be corrected.

FIGURE 3-3: LAND USE



3.2 PROPOSED ACTION ENVIRONMENTAL ANALYSIS

This section describes the general characteristics of the environment within the Project Study Areas, the significance threshold for environmental effects, the Proposed Action's potential environmental effects compared to the No Action Alternative, and mitigation measures to resolve adverse effects, if needed, for the following 13 environmental resources.

The environmental analysis also includes the potential effects of the reasonably foreseeable future actions (2026-2031) that may occur on Airport property and within the Indirect Study Area (pending NEPA analysis and approval). The reasonably foreseeable future actions include the following:

- HEF Runway 16L-34R Rehabilitation,
- HEF Terminal Expansion – AVPORTS project for airside and landside improvements and associated commercial service,
- Prince William County and JR Real Estate, Bristow Crossing Intersection Project (JR Real Estate Group, 2024),
- Virginia Railway Express Broad Run Station and Maintenance and Storage Facility (MSF) Improvements (Virginia Railway Express, 2024).

3.2.1 Air Quality

The Clean Air Act (CAA) is the primary statute related to air quality (42 U.S.C. § 7401 et seq.) The CAA regulates air pollutant emissions from stationary and mobile sources and authorizes the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The CAA also gives the EPA authority to regulate Hazardous Air Pollutants.

The EPA has identified the following six criteria air pollutants for which NAAQS are applicable: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO_2), Ozone (O_3), Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants are termed "criteria" air pollutants because the EPA regulates them by developing human health-based and/or environmentally-based criteria for establishing permissible levels (U.S. Environmental Protection Agency, 2023). See ***Table 3-1*** for the 2024 NAAQS standards for criteria pollutants (EPA, 2024).

Areas that violate one or more NAAQS pollutants are classified as "nonattainment areas." States with nonattainment areas must develop a State Implementation Plan (SIP) demonstrating how the areas will be brought back into attainment of the NAAQS. Areas where concentrations of the criteria pollutants are below (i.e., within) these threshold levels are classified as "attainment areas." Areas with prior nonattainment status that have since transitioned to attainment are known as "maintenance areas." See ***Table 3-2*** for NAAQS de minimis threshold rates for nonattainment and maintenance areas.

Table 3-1: 2024 National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours 1 hour	9 ppm 35 ppm	Not to be exceeded more than once per year
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3 (1)	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 and Secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		Primary and Secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	9.0 µg/m^3	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and 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 (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	1 year	10 ppb	Annual mean, averaged over 3 years

Source: EPA 2024

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Table 3-2 **Threshold Rates for Nonattainment and Maintenance Areas**

Criteria Pollutants, Classifications and Precursors											
Nonattainment Areas			***de minimis* Threshold Rates (tons/year)**								
			CO	**NH_3**	**NO_2**	**NO_x**	**Pb**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
CO			100	-	-	-	-	-	-	-	-
NO_2			-	-	100	100	-	-	-	-	-
O_3	Marginal and Moderate	Outside OTR	-	-	-	100	-	-	-	-	100
		Inside OTR	-	-	-	100	-	-	-	-	50
	Serious		-	-	-	50	-	-	-	-	50
	Severe		-	-	-	25	-	-	-	-	25
	Extreme		-	-	-	10	-	-	-	-	10
Pb			-	-	-	-	25	-	-	-	-
$PM_{2.5}$	Moderate		-	100	-	100	-	100	-	100	100
	Serious		-	70	-	70	-	70	-	70	70
PM_{10}	Moderate		-	-	-	-	-	-	100	-	-
	Serious		-	-	-	-	-	-	70	-	-
SO_2			-	-	-	-	-	-	-	100	-
Maintenance Areas			***de minimis* Threshold Rates (tons/year)**								
			CO	**NH_3**	**NO_2**	**NO_x**	**Pb**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**	**VOC**
CO			100	-	-	-	-	-	-	-	-
NO_2			-	-	100	100	-	-	-	-	-
O_3	Outside OTR		-	-	-	100	-	-	-	-	100
	Inside OTR		-	-	-	100	-	-	-	-	50
Pb			-	-	-	-	25	-	-	-	-
$PM_{2.5}$			-	100	-	100	-	100	-	100	100
PM_{10}			-	-	-	-	-	-	100	-	-
SO_2			-	-	-	-	-	-	-	100	-

Sources: 40 CFR 93.153(b)(1). 40 CFR 93.153(b)(2). Notes: OTR = Ozone Transport Region

3.2.1.1 Affected Environment

The Project Study Areas are located entirely within Prince William County, which is classified as "attainment" for all criteria pollutants excluding 8-Hour Ozone (2015) and (2008) (U.S. Environmental Protection Agency, 2024). Prince William County and the City of Manassas are in "Moderate - Nonattainment" for 8-Hour Ozone (2015) and in "Marginal - Maintenance" for 8-Hour Ozone (2008), which is comprised of Nitrogen Oxide (NO_x) and volatile organic compounds (VOCs). Prince William County and the City of Manassas reside in the Ozone Transportation Region (OTR) (U.S. Environmental Protection Agency, 2023). The Clean Air Act established a single transport region for Ozone (i.e., OTR), which covers portions of the northeast and mid-Atlantic states to address and reduce cross-state pollution of ozone (EPA, 2024). All construction activity would occur in the EA's Direct Study Area which is entirely

within the City and is also an "attainment" area for all NAAQS, excluding 8-Hour Ozone (2015) and (2008) standards.

3.2.1.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F, Exhibit 4-1, provides the FAA's significance threshold for air quality, which states, "The action would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the EPA under the Clean Air Act (CAA), for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations."

Potential Impacts - Construction of the Proposed Action would cause a minor increase in surface vehicles using area roadways to access the construction sites (i.e., approximately 8 construction-related vehicles and 45 construction employee-related vehicles). However, this would be temporary, lasting the duration of construction from 2026 to 2027. A Construction Emissions Inventory (CEI) of the Proposed Action was conducted through the EPA's Motor Vehicle Emission Simulator (MOVES) program (see ***Appendix B***). The CEI was evaluated using the estimated duration of construction, the Proposed Action dimensions, and the model's assumption of construction vehicles and equipment across that time frame. For informational purposes, greenhouse gas (GHG) emissions were also analyzed and are further discussed in ***Section 3.2.3, Climate***. The primary GHGs are Carbon Dioxide (CO_2), Methane (CH_4), and Nitrous Oxide (N_2O).

Table 3-3 and ***Table 3-4*** show the construction emissions inventory results and GHG emissions. As mentioned previously, the Indirect Study Area is "Marginal - Maintenance" for 8-Hour Ozone (2008), "Moderate - Nonattainment" for 8-Hour Ozone (2015), and "attainment" for all other NAAQS criteria pollutants. The CEI results concluded that no NAAQS emissions category would approach or surpass any *de minimis* threshold. See ***Appendix B*** for detailed CEI results. The Proposed Action would have no significant effect on air quality.

The Proposed Action would not increase aircraft operations at the Airport. Compared to a No Action Alternative, the Proposed Action would not result in any change to aircraft operational emissions or affect the region's NAAQS status.

Implementing the Proposed Action would cause a less than significant environmental effect on Air Quality. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

TABLE 3-3: PROPOSED ACTION MOVES3 RESULTS FOR 2026 (TONS PER YEAR)

							GHGs		
2026	CO	VOC	NOx	PM_{10}	$PM_{2.5}$	SOx	CO_2	CH_4	N_2O
NONROAD	0.36	0.08	0.87	0.06	0.06	0.00	1,340.84	N/A	N/A
ONROAD	1.13	0.02	0.16	0.01	0.01	0.00	150.41	0.00	0.00
FUGITIVE	0.00	0.37	0.00	0.13	N/A	0.00	N/A	N/A	N/A
TOTAL	1.49	0.47	1.02	0.20	0.07	0.00	1,491.24	0.00	0.00
De Minimis Levels[1]	*100*	*50*	*100*	*100*	*100*	*100*	*N/A*	*N/A*	*N/A*

Note – N/A = not applicable. Totals may not sum due to rounding.

[1]: *De Minimis Levels* shown represent an area that would be in non-attainment for NAAQS pollutants; see 40 CFR 93.153 https://www.ecfr.gov/current/title-40/section-93.153. However, Prince William County and the City of Manassas are in "attainment" for all NAAQS. Excluding for 8 – Hour Ozone. Prince William County is located in the Ozone Transportation Region. Source: MOVES3.1, RS&H 2024.

TABLE 3-4: PROPOSED ACTION MOVES3 RESULTS FOR 2027 (TONS PER YEAR)

							GHGs		
2027	CO	VOC	NOx	PM_{10}	$PM_{2.5}$	SOx	CO_2	CH_4	N_2O
NONROAD	0.05	0.01	0.29	0.01	0.01	0.00	174.01	N/A	N/A
ONROAD	0.44	0.00	0.02	0.00	0.00	0.00	47.14	0.00	0.00
FUGITIVE	0.00	0.00	0.00	0.05	N/A	0.00	N/A	N/A	N/A
TOTAL	0.49	0.01	0.31	0.05	0.01	0.00	221.15	0.00	0.00
De Minimis Levels[1]	*100*	*50*	*100*	*100*	*100*	*100*	*N/A*	*N/A*	*N/A*

Note – N/A = not applicable. Totals may not sum due to rounding.

[1]: *De Minimis Levels* shown represent an area that would be in non-attainment for NAAQS pollutants; see 40 CFR 93.153 https://www.ecfr.gov/current/title-40/section-93.153. However, Prince William County and the City of Manassas are in "attainment" for all NAAQS. Excluding for 8 – Hour Ozone. Prince William County is located in the Ozone Transportation Region. Source: MOVES, RS&H 2024.

Mitigation Measures - The Proposed Action would not result in significant air quality effects. Therefore, the City does not propose mitigation measures.

Although construction of the Proposed Action would not cause a significant effect on air quality, the construction contractor would conduct construction activities in accordance with FAA AC 150/5370-10, Standards for Specifying Construction of Airports. During construction, fugitive dust would be minimized by using control measures, including, but not limited to:

- Use of water for dust control (where possible and practicable),
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dust material,
- Covering of open equipment for conveying materials, or
- Prompt removal of spilled or tracked dirt or other materials from paved areas and removal of dried sediments from soil erosion.

The selected construction contractor could also implement EPA recommendations and/or construction best management practices (BMPs), including, but not limited to:

- Reducing equipment idling time through operator training and contracting policies,

- Using cleaner-burning or low-emission fuel in equipment,
- Encouraging employee carpooling,
- Limiting construction activities during high wind events to prevent dust,
- Reducing vehicle speeds on unpaved roads, or
- Implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with cleaner engines, replacing older vehicles, and inspecting and maintaining fuel tanks in accordance with regulations.

Based on Virginia Department of Environmental Quality's (VDEQ's) EA comments, several requirements and recommendations to minimize air pollution were described. The following will be implemented as applicable:

> During land-disturbing activities, fugitive dust will be kept to a minimum by using control methods outlined in 9VAC5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following, as applicable:
>
> - Use, where possible, of water or suitable chemicals for dust control during the proposed demolition and construction operations and from material stockpiles;
> - Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
> - Covering of open equipment for conveying materials; and
> - Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.
>
> When paving surfaces, asphalt must be "emulsified" (predominantly cement and water with a small amount of emulsifying agent) except when specified circumstances apply. Moreover, there are time-of-year restrictions on its use from April through October in VOC emission control areas.

Precautions would be taken to restrict the emissions of VOC's and NOx, principally by limiting the burning of fossil fuels. The final design of the replacement ATCT has not been completed. If an air permit is required per 9 VAC5-80, Article 6, the City will apply for and obtain one prior to construction before commencing construction or operation.

3.2.2 Biological Resources

Per guidance within the FAA *1050.1F Desk Reference*, "Biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include terrestrial and aquatic plant and animal species; game and non-game species; special status species (state or federally listed threatened or endangered species, marine mammals, or species of concern,

such as species proposed for listing or migratory birds); and environmentally-sensitive or critical habitats."

The federal Endangered Species Act (ESA) (16 U.S.C. § 1531 et seq.) protects plants and wildlife that are listed by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) as endangered or threatened. Section 9 of the ESA prohibits the "take" of federally-listed species, where take is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (U.S. Fish and Wildlife Service, 2024). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in a violation of state law. Section 7 of the ESA requires agencies to consult with the USFWS or NMFS to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats (U.S. Fish and Wildlife Service, 2024).

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 et seq.) prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior, through the U.S. Fish and Wildlife Service.

The Bald Eagle and Golden Eagle Protection Act (BGEPA) (16 U.S.C. § 668-668d) prohibits anyone without a permit issued by the Secretary of the U.S. Department of Interior from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs.

3.2.2.1 Affected Environment

Environmental Setting - The Project Study Areas are located within the Potomac River Basin, which is part of the larger Chesapeake Bay watershed. Land uses around the Airport are a mix of urban and rural; land uses to the north and east are urbanized areas of the City of Manassas and Prince William County, and land uses to the south and west are primarily undeveloped agricultural, forested, and low-density development. Broad Run, a perennial stream surrounded by dense forest habitat, runs through the Indirect Study Area and is approximately 270 feet southwest of the Direct Study Area at its nearest point. Approximately half of the airport property lies within the 100-year floodplain for Broad Run. Refer to ***Section 3.2.12*** for more details on water resources.

The Direct Study Area (Replacement ATCT and FAA RTR) contains approximately 1 acre of cleared forest with remaining stumps and mulched branches/logs; 2 acre of forest habitat; 0.3-acre of mowed and maintained grass; and 0.9-acre of paved and/or graded surfaces associated with Observation Road, an existing parking lot, a dirt road, and a clearing to store equipment and materials. The Direct Study Area (Replacement ATCT) is immediately adjacent to aircraft hangars, taxilanes, and parking lots along Runway 16R-34L. The Direct Study Area (Replacement ATCT and FAA RTR) provides low habitat value to wildlife species sensitive to high levels of

human activity. The Direct Study Area (Replacement ATCT) is surrounded by forest habitat to the north, west, and south, while the Direct Study Area (FAA RTR) includes and is surrounded by mowed and maintained grass.

A wetland delineation and biological site survey conducted in April 2024 (see ***Appendix C***) identified the predominant tree species as American elm (*Ulmus Americana*), red maple (*Acer rubrum*), pignut hickory (*Carya glabra*), and white oak (*Quercus alba*) for the Direct Study Area (Replacement ATCT). Typical shrub species are blackhaw (*Viburnum prunifolium*) and common pawpaw (*Asimina triloba*). Groundcover vegetation was varied and included Japanese honeysuckle (*Lonicera japonica*), mayapple (*Podophyllum peltatum*), star chickweed (*Stellaria pubera*), common wood sedge (*Carex blanda*), wild geranium (*Geranium maculatum*), and Virginia springbeauty (*Claytonia virginica*). The survey documented sightings or signs of various wildlife species, including the pileated woodpecker (*Dryocopus pileatus*), blue jay (*Cryanocitta cristata*), gray squirrel (*Scurius carolinensis*), cardinal (*Cardinalis cardinalis*), white tailed deer *(Odocoileus virginianus*), racoon (*Procyon lotor*), and zebra swallowtail butterfly (*Eurytides marcellus*).

Federal and State Listed Species - The USFWS Information for Planning and Consultation (IPaC) tool provides information about potential impacts on federally listed species and critical habitats, identified three (3) federally endangered, proposed endangered, or proposed threatened species for the Direct Study Area. The Virginia Fish and Wildlife Information Service (VaFWIS) provides data on wildlife species, habitats, and natural resources within 2-miles of the Project Study Areas. See ***Table 3-5*** and ***Table 3-6*** below for protected species identified by USFWS and VaFWIS and ***Appendix C*** for more detailed information and regulatory correspondence.

TABLE 3-5: FEDERAL LISTED SPECIES POTENTIALLY WITHIN THE PROJECT STUDY AREA

Common Name	Scientific Name	Taxa	Federal Listing
Tricolored bat	*Perimyotis subflavus*	Mammal	Proposed Endangered
Dwarf wedgemussel	*Alasmidonta heterodon*	Clam	Endangered
Monarch butterfly	*Danaus plexippus*	Insect	Proposed Threatened

Source: USFWS, 2024

TABLE 3-6: STATE LISTED SPECIES POTENTIALLY WITHIN 2 MILES OF THE DIRECT STUDY AREA

Common Name	Scientific Name	Taxa	State Listing
Northern long-eared bat	*Myotis septentrionalis*	Mammal	Threatened
Tricolored bat	*Perimyotis subflavus*	Mammal	Endangered
Little brown bat	*Myotis lucifugus*	Mammal	Endangered
Dwarf wedgemussel	*Alasmidonta heterodon*	Clam	Endangered
Yellow lance	*Elliptio lanceolata*	Clam	Threatened

Common Name	Scientific Name	Taxa	State Listing
Brook floater	*Alasmidonta varicose*	Clam	Threatened
Atlantic sturgeon	*Acipenser oxyrinchus*	Fish	Endangered
Peregrine falcon	*Falco peregrinus*	Bird	Threatened
Henslow's sparrow	*Centronyx henslowii*	Bird	Threatened
Loggerhead shrike	*Lanius ludovicianus*	Bird	Threatened
Monarch butterfly	*Danaus plexippus*	Insect	Federally Proposed Threatened

Source: VaFWIS, 2024

Per the USFWS (2024) IPaC species list, the Direct Study Area does not contain any federally-designated critical habitats. The VaFWIS (2024) report does not identify bald eagle concentration areas, roosts, or nests.

Species of Greatest Conservation Need and Migratory Birds - The Virginia Department of Wildlife Resources (2015) Wildlife Action Plan lists 39 priority Species of Greatest Conservation Need (SGCN) for the Northern Virginia Planning Region. Based on the habitat descriptions provided in the 2015 Wildlife Action Plan and the habitat present within the Direct Study Area, 13 priority SGCN species have the potential to occur in the Direct Study Area, all of which are also migratory bird species. The USFWS (2024) IPaC species list identified eight (8) migratory birds for the Direct Study Area. These migratory bird species are listed in ***Table 3-7***, including each bird's BGEPA, Birds of Conservation Concern (BCC), and/or SGCN status (U.S. Fish and Wildlife Service, 2024).

TABLE 3-7: SGCN AND MIGRATORY BIRD SPECIES

Common Name	Scientific Name	USFWS Status[/1/]	SGCN Status [/2/]
Bald eagle	*Haliaeetus leucocephalus*	BGEPA	--
Belted kingfisher	*Megaceryle alcyon*	BCC	Tier III
Black-billed cuckoo	*Coccyzus erythropthalmus*	BCC	Tier II
Brown thrasher	*Toxostoma rufum*	--	Tier IV
Chimney swift	*Chaetura pelagica*	BCC	Tier IV
Eastern towhee	*Pipilo erythrophthalmus*	--	Tier IV
Eastern whip-poor-will	*Antrostomus vociferus*	BCC	Tier III
Eastern wood-pewee	*Contopus virens*	--	Tier III
Grasshopper sparrow	*Ammodramus savannarum perpallidus*	BCC	Tier IV
Kentucky warbler	*Geothlypis Formosa*	BCC	Tier III
Northern Flicker	*Colaptes auratus*	--	Tier IV

Common Name	Scientific Name	USFWS Status[/1/]	SGCN Status [/2/]
Prairie warbler	*Setophaga discolor*	BCC	--
Prothonotary Warbler	*Protonotaria citrea*	BCC	--
Red-headed woodpecker	*Melanerpes erythrocephalus*	BCC	--
Rusty blackbird	*Euphagus carolinus*	BCC	Tier IV
Wood thrush	*Hylocichla mustelina*	BCC	Tier IV
Yellow-billed cuckoo	*Coccyzus americanus*	BCC	Tier III

Source: USFWS, 2024; Virginia Department of Wildlife Services, 2023. [/1/] BGEPA = Bald Eagle and Golden Eagle Protection Act; BCC = Bird of Conservation Concern. [/2/] SGCN Tier II = very high conservation need; SGCN Tier III = high conservation need; SGCN Tier IV = moderate conservation need.

Non-listed migratory bird species may also occur in the Project Study Areas. The MBTA protects both listed and non-listed migratory birds.

3.2.2.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F, Exhibit 4-1, provides the FAA's significance threshold for biological resources, which states, "The USFWS 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." Non-listed species have no significance threshold, but factors for consideration are as follows:

- "A long-term or permanent loss of unlisted plant or wildlife species, i.e., extirpation of the species from a large project area (e.g., a new commercial service airport); or
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats; or
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- 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."

Potential Impacts – The forest habitat in the Direct Study Area (Replacement ATCT) may be used by the tricolored bat during the non-hibernation season (Virginia Department of Wildlife Resources, 2024) and migratory bird species identified in ***Section 3.2.2.1***; therefore, the Proposed Action was evaluated for impacts to those species. The Direct Study Area (FAA RTR) does not include any critical habitat or habitat that would support the identified threatened and endangered species. This area's habitat is limited to mowed and maintained grass.

The biological site survey conducted in April 2024 confirmed that the Direct Study Area (Replacement ATCT) does not contain suitable habitat for the dwarf wedgemussel, monarch

butterfly, or bald eagle. Specifically, dwarf wedgemussel habitat consists of the bottom substrates of rivers and creeks (U.S. Fish and Wildlife Service, 2024). Monarch butterfly habitat includes prairies, grasslands, and wetlands with high-density milkweed stands (U.S. Fish and Wildlife Service, 2024). Bald eagles select habitats near large bodies of open water with large trees available for nesting and perching (U.S. Fish and Wildlife Service, 2024). As these habitats are absent in the Direct Study Area (Replacement ATCT and FAA RTR), the Proposed Action would not affect the dwarf wedgemussel, monarch butterfly, and bald eagle. See ***Table 3-8*** for the Proposed Action's ESA Section 7 Determination.

TABLE 3-8: ESA SECTION 7 DETERMINATION

Species	Habitat/Species Presence in Project Study Area	ESA Section 7 Determination	Project Elements that Support Determination
Tricolored Bat (*Perimyotis subflabus*)	Suitable habitat present	Not Likely to Adversely Affect	Two acres of the Direct Study Area (Replacement ATCT) is forested and immediately adjacent to aircraft hangars, taxi lanes, and parking lots. There are few large trees and no caves for hibernation. Tricolored bats that may be present during construction are highly mobile and would relocate to adjacent suitable habitat in the vicinity. The amount of forested habitat (approx. 2 acres) is negligible compared to the suitable habitat in the vicinity.
Dwarf Wedgemussel *(Alasmidonta heterodon)*	No suitable habitat is present	No effect	
Monarch Butterfly *(Danaus Plexippus)*	No suitable habitat is present	No effect	

Source: USFWS, Self-Certification Letter, Consultation Code: 2024-0088272. 2024. See Appendix C for further details.

Construction – The Proposed Action requires clearing and grubbing approximately 1 acre of trees and shrubs within the Direct Study Area (Replacement ATCT) and grubbing of approximately 1 acre of stumps and mulched branches/logs from trees already cleared in the Direct Study Area (Replacement ATCT). The clearing and grubbing would occur along Observation Road, immediately across from aircraft hangars and aprons. As such, the 2 acres where clearing and/or grubbing would occur provide low habitat value to most wildlife species due to proximity to the high levels of human activity. Tricolored bats or migratory birds that

may be present during construction are highly mobile and would relocate to adjacent suitable habitats and remain unharmed. Further, the amount of forest habitat impacted (approximately 1 acre) is negligible compared to the abundant, suitable habitat in the vicinity. Construction of the FAA RTR would be on mowed and maintained grass on Airport property and would have no effect on these species.

Operational – The operation of the Proposed Action would not increase aircraft operations, change the aircraft fleet mix, or affect landside or airside operations. The Proposed Action's ATCT must be lighted in accordance with FAA Advisory Circular 70/7460-1M, Obstruction Marking and Lighting (e.g., small red light atop the structure or its antennas). The change in lighting is not anticipated to increase the overall effect of lighting on wildlife at the Airport. Therefore, compared to the No Action Alternative, the operation of the Proposed Action would not affect federally-listed, state-listed, SGCN, and migratory bird species. Per FAA Order 1050.1F significance thresholds, the Proposed Action would not significantly affect biological resources.

Implementing the Proposed Action would cause a less than significant environmental effect on Biological Resources. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – All work will be conducted in compliance with applicable regulations. To ensure no take of migratory birds, tree removal under the Proposed Action would occur between September 11 and March 30, which is outside of the breeding and nesting season for identified migratory bird species (April 1 to September 10) (U.S. Fish and Wildlife Service, 2024). In addition, tree removal from September 11 to March 30 also avoids the tri-colored bat pup season (May 1 through July 15), when pups are non-volant and cannot escape the disturbance (McCoshum, 2023).

The USFWS recommends that tree removal not occur when daily high temperatures are below 45 degrees Fahrenheit (F) and when bats in torpor are less likely to be able to safely flush from the disturbance.

As described at the beginning of this chapter, tree clearing as a part of the geotechnical survey occurred on March 24 and March 29, 2025, which is outside of the migratory bird breeding and nesting season, and the tri-colored bat pup season. According to the National Oceanic and Atmospheric Administration, the average daily temperature in the area was 54.5 degrees F and 73 degrees F on March 24 and March 29, 2025, respectively, which is well above the 45 degrees F threshold recommended by the USFWS (National Oceanic and Atmospheric Administration, 2025).

With the implementation of these commitments, the construction of the Proposed Action would not affect migratory birds or bats. Additional mitigation measures are not required or proposed.

During the review of the Draft EA, VDEQ determined that the current activity (i.e., Proposed Action) will not affect any document state-listed plants or insects.

3.2.3 Climate

Scientific measurements show that the Earth's climate is warming, and research has shown a direct correlation between fuel combustion and emissions of greenhouse gases (GHGs), which are known to trap heat in the atmosphere. The principal GHGs that enter the atmosphere because of human activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (U.S. Environmental Protection Agency, 2018).

3.2.3.1 Affected Environment

As described in ***Section 3.2.1***, the Project Study Areas are located within Prince William County, which is classified as in "attainment" for all criteria pollutants excluding 8-Hour Ozone (2015) and (2008) (U.S. Environmental Protection Agency, 2024). Prince William County and the City of Manassas are in moderate nonattainment for 8-Hour Ozone (2015) and marginal maintenance for 8-Hour Ozone (2008), comprised of NOx and VOCs. Prince William County resides in the Ozone Transportation Region (OTR) (U.S. Environmental Protection Agency, 2023).
All construction activity would occur in the EA's Direct Study Area which is entirely within the City of Manassas, which is also an "attainment" area for all NAAQS excluding 8-Hour Ozone (2015) and (2008) standards. In 2021, the GHG emissions for the U.S. were 6,025 million metric tons of carbon dioxide equivalent[9] (MMT CO_{2e}), and the State of Virginia was 120 MMT CO_{2e} (U.S. Environmental Protection Agency, 2024).

3.2.3.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F does not provide a significance threshold for aviation related GHG emissions. The FAA *1050.1F Desk Reference* (Federal Aviation Administration, 2023) states, "It is not currently useful for the NEPA analysis to attempt to link specific climate impacts to the proposed action or alternative(s) given the small percentage of emissions aviation and commercial space launch projects contribute."

Potential Impacts

Construction GHG Emissions – The Proposed Action would generate GHG emissions during construction (approximately 0.0015 MMT CO_{2e} for 2026 and 0.00022 MMT CO_{2e} for 2027) (see

[9] Carbon dioxide equivalent means the number of metric tons of CO_2 emissions with the same global warming potential as one metric ton of another greenhouse gas.

Appendix B for additional information). Using fossil fuel-powered machinery during the construction of the Proposed Action would emit GHGs such as CO_2. Increasing the number of construction-related personal vehicles traveling to and from the Airport would increase vehicle-related GHG emissions. For this EA, it is assumed that most construction-related workers already live and work in the region; therefore, the region's vehicle-related GHG emissions would not significantly change. The GHG emissions for the U.S. in 2022 was 6,378 million metric tons of Carbon Dioxide equivalent (MMT CO_{2e}), and 117 MMT CO_{2e} was produced from the State of Virginia in 2022 (EPA, 2024). In the context of global and U.S. Greenhouse Gas emissions, the construction of the Proposed Action's emissions of 0.0015 MMT CO_{2e} for 2026 and 0.00022 MMT CO_{2e} for 2027 would not be significant. Therefore, compared to the No Action Alternative, the construction of the Proposed Action would have no significant effect on GHG emissions for the State of Virginia, the U.S., or the global climate.

Operational GHG Emissions – The Proposed Action would not increase the number of aircraft operating at the Airport. Therefore, compared to the No Action Alternative, the operation of the Proposed Action would have no significant effect on GHG emissions for the State of Virginia, the U.S., or the global climate.

Implementing the Proposed Action would cause a less than significant environmental effect on Climate. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – All work will be conducted in compliance with applicable regulations. No additional mitigation measures are required or proposed. Although the Proposed Action would not significantly affect global GHG emissions, the Proposed Action could include BMPs to reduce construction-related GHG emissions to the highest level practicable. See ***Section 3.2.1.2*** for measures to reduce emissions.

3.2.4 Coastal Resources

Per guidance within the FAA *1050.1F Desk Reference*, "Coastal resources include all natural resources occurring within coastal waters and their adjacent shorelands. Coastal resources include islands, transitional and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within these areas. Coastal resources include the coastlines of the Atlantic and Pacific oceans, the Great Lakes, and the Gulf of Mexico." Coastal resources protected under the Coastal Zone Management Act (16 U.S.C. § 1451-1466); Coastal Barrier Resources Act (16 U.S.C. Section 3501 et seq.); National Marine Sanctuaries Act (16 U.S.C. § 1431 et seq.); Executive Order (EO) 13089 (1998), *Coral Reef Protection*; and EO 13547 (2010), *Stewardship of the Ocean, Our Coasts, and the Great Lakes*.

The Virginia Coastal Zone Management (CZM) Program was established in 1986 under Executive Order to comply with federal regulations and protect the State's coastal resources. The program is managed by the VDEQ but relies on a network of state agencies and local governments to administer Virginia CZM Program Enforceable Policies (Virginia Department of Environmental Quality, 2021).

The Chesapeake Bay Preservation Act is an enforceable program of the Virginia CZM Program that establishes resource protection areas (RPAs) and resource management areas (RMAs). RPAs consist of perennial streams, tidal shores, tidal wetlands, certain non-tidal wetlands, and the required 100-foot buffer. In general, no development, land disturbance, or vegetation removal is allowed in an RPA; however, some development activities are allowed, subject to Prince William County review and approval (Prince William County, 2024). RMAs are contiguous to and extend 500 feet landward of the RPA and include floodplains, highly erodible soils, steep slopes, and highly permeable soils. Development in the RMA is less restricted; however, water quality measures may be necessary. All of Prince William County is within an RMA; therefore, developers are required to implement BMPs to minimize erosion, control runoff, and prevent pollution (Prince William County, 2024). A Flood Hazard Use Permit is also required for all work within the floodplain and/or floodway (Prince William County, 2024).

3.2.4.1 Affected Environment

According to VDEQ, both the Project Study Areas are located within the Virginia Coastal Zone (Virginia Department of Environmental Quality, 2024). However, the City of Manassas is not subject to the Chesapeake Bay Preservation Act regulations because the City of Manassas is not affected by tidal wetlands. According to the Prince William County (2024) GIS Data Portal, the Direct Study Area (Replacement ATCT) is also within the mapped RPA wetland buffer of Broad Run, the nearest perennial stream (see ***Figure 3-4***). The Direct Study Area (FAA RTR) is not within the mapped RPA wetland buffer of Broad Run.

However, the Direct Study Area (Replacement ATCT) is approximately 270 feet northeast of Broad Run at its nearest point, and a wetland survey performed in April 2024 did not identify wetlands within the footprint of the Proposed Action (see ***Appendix C***). On October 29, 2024, the wetland survey information was transmitted to the USACE for review and comment. Multiple inquiries were made to acquire the USACE's input regarding the lack of wetlands in the Direct Study Area. As of December 2025, the USACE has not replied to the information submitted. The Direct Study Area is within the 100-year floodplain of Broad Run, further described in ***Section 3.2.12.1***.

The Project Study Areas are not located within a designated Coastal Barrier Resource System (CBRS) as delineated by the USFWS Official CBRS Maps. The nearest CBRS Resource is MD-56 (St. Catherine Island), 52 miles southeast of the Indirect Study Area (U.S. Fish and Wildlife Service, 2024).

3.2.4.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F does not define a significance threshold for coastal resources; however, it does provide factors to consider in evaluating the context and intensity of potential environmental impacts on coastal resources. These include when the action would have the potential to:

- Be inconsistent with the relevant state coastal zone management plan(s);
- Impact a coastal barrier resource system unit (and the degree to which the resource would be impacted);
- Pose an impact to coral reef ecosystems (and the degree to which the ecosystem would be affected);
- Cause an unacceptable risk to human safety or property or
- Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.
- Potential Impacts

Construction – The construction and operation of the Proposed Action would not occur within the Virginia Coastal Zone boundary. Previous VDEQ coordination described that the City of Manassas is not subject to the Chesapeake Bay Preservation Act (see ***Appendix G)***. Additionally, the Code of Virginia describes that the only areas required to adopt the Chesapeake Bay Regulations are those with tidal wetlands. The City of Manassas and Manassas Park do not have tidal wetlands and are, therefore, not subject to the Chesapeake Bay Regulations (Virginia Department of Environmental Quality, 2024). The Direct Study Area is within the County's mapped RPA of Broad Run. A wetland delineation performed in April 2024 did not identify any wetlands within the Direct Study Area (Replacement ATCT). Further, the Direct Study Area (Replacement ATCT) is approximately 270 feet from Broad Run at its nearest point (i.e., more than 170 feet from Broad Run RPA). Therefore, compared to the No Action Alternative, construction of the Proposed Action would have no effect on coastal resources.

Operational - Following construction, the Proposed Action would include on-site stormwater management facilities for detention (refer to ***Section 3.2.12.2***) to ensure no operational impacts to the Virginia Coastal Zone or Broad Run RPA, resulting in no effect on coastal resources when compared to the No Action Alternative.

Implementing the Proposed Action would cause a less than significant environmental effect on Coastal Resources. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

FIGURE 3-4: PRINCE WILLIAM COUNTY RESOURCE PROTECTION AREAS

Mitigation Measures – The City of Manassas is not subject to the Chesapeake Bay Preservation Act regulations because the City of Manassas is not affected by tidal wetlands; however, all work would be conducted in compliance with federal, state, and local laws and regulations and would implement BMPs to minimize erosion, control runoff, and prevent pollution during construction to avoid impacts to waters outside of the project area (refer to ***Section 3.2.13.2***). Mitigation measures are not required or proposed.

3.2.5 Department of Transportation Act, Section 4(f) and 6(f)

Section 4(f) of the USDOT Act of 1966 (49 USC § 303) provides protection for publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites eligible for listing in the National Register of Historic Places (NRHP) unless it is determined there is no feasible and prudent alternative and a proposed action includes all possible planning to minimize harm. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of a Section 4(f) resource only if there is no feasible and prudent alternative to the using that land and the program or project includes all possible planning to minimize harm resulting from the use.

A proposed action can "use" a Section 4(f) property physically or constructively. A physical use occurs when there is a taking of a Section 4(f) property through the purchase of land, certain easements, physical occupation of a portion or all of the property, or alteration of structures or facilities on the property. Constructive use occurs when the impacts of a project on a Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired.

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (LWCF Act) (16 U.S.C. §§ 4601-4 et seq) provides funds for buying or developing public-use recreational lands through grants to local and state governments. Section 6(f) prevents the conversion of lands purchased or developed with LWCF Act funds to non-recreation uses, like airport projects, unless the Secretary of the U.S. Department of the Interior, through the National Park Service, approves the conversion of the land use.

3.2.5.1 Affected Environment

There are no USDOT Section 4(f) resources within the Direct Study Area. However, the Indirect Study Area contains Bristoe Station Battlefield Heritage Park, commemorating the Battle of Kettle Run, which is a 140-acre county-owned park preserving a portion of the Bristoe Station Battlefield, located about 1 mile west of the Direct Study Area (Replacement ATCT) (Prince William County Parks & Recreation, 2024). Additionally, the Direct Study Area (FAA RTR) is within the Virginia Department of Historic Resources (DHR) identified boundary for the Bristoe Station Battlefield (DHR ID 076-0024 and 076-5036). Valley View Park is about 1 mile southwest of the Indirect Study Area (Prince William County Parks & Recreation, 2024). The

nearest wildlife and waterfowl refuge is the Occoquan Bay National Wildlife Refuge, located over 15 miles southeast of the Indirect Study Area (U.S. Fish and Wildlife Service, 2024).

No Section 6(f) resources exist within the Project Study Areas. The nearest park land purchased with LWCF Act funds is Marstellar Park, located about 2.5 miles northeast of the Indirect Study Area (Trust for Public Land, 2024).

Refer to ***Figure 3-5*** for locations of Section 4(f) and Section 6(f) resources in the vicinity of the Direct Study Area and Indirect Study Area.

3.2.5.2 Environmental Consequences

Significance Threshold – FAA Order 1050.1F provides the FAA's significance threshold for Section 4(f), which states, "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."

Potential Impacts

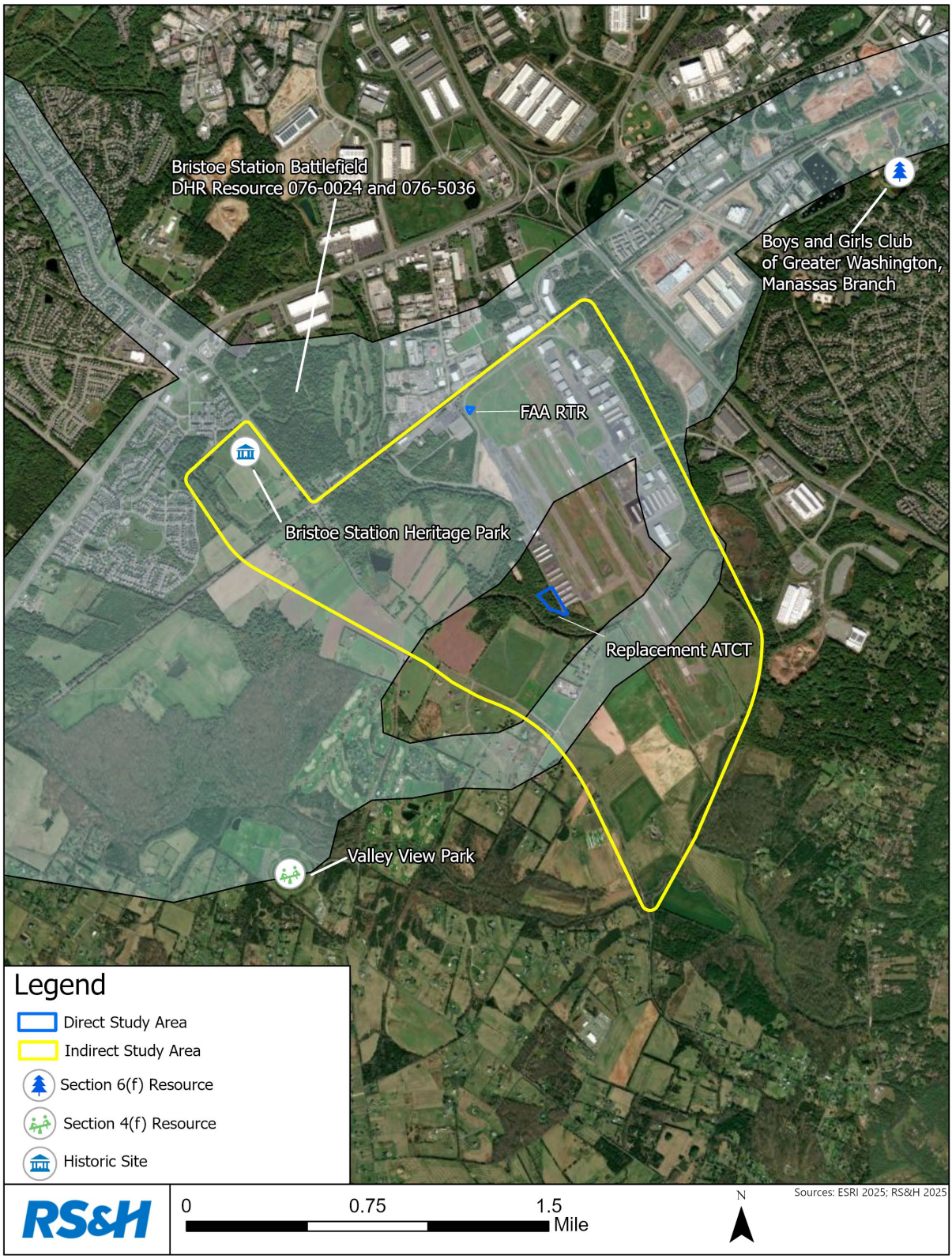
Construction – There are no Section 4(f) or Section 6(f) resources within the Direct Study Area (Replacement ATCT), therefore, construction of the Replacement ATCT would not physically use (directly impact) any Section 4(f) or Section 6(f) resources.

Throughout the Airport's development and in prior Airport construction projects in the Direct Study Area (FAA RTR), the soil has been considerably disturbed. Fill material was used in the Direct Study Area (FAA RTR) when the Airport was initially constructed in the mid-1960s. This area was then graded during the construction of Observation Road in the mid-1980s and the interior service road in 2008-2009, which included stormwater ditches and fencing. Therefore, the proposed FAA RTR towers and electrical building would be constructed in fill material used for past Airport projects.

In addition, construction of the Proposed Action would not affect environmental resources (e.g., air quality, noise, etc.) in a manner that would constructively use (indirectly impact) any Section 4(f) or 6(f) resource.

Based on the Phase I archaeological survey of the Direct Study Area (Replacement ATCT), the construction of the Proposed Action would not have any impact on historic, architectural, archaeological, or cultural resources listed in or eligible for the National Register of Historic Places (see Section 3.2.8 for further details). As described in Section 3.2.8 of this EA, on April 16, 2025, the DHR concurred that the Proposed Action (Replacement ATCT) resulted in a *No Adverse Effect* determination on historic resources.

FIGURE 3-5: SECTION 4(F) AND 6(F) RESOURCES



In addition, on January 8, 2026, the FAA submitted a Section 106 coordination letter and accompanying Project Review Application Form to the DHR. The letter and supporting materials described the addition to the APE, the potential direct effects, alternative FAA RTR locations and evaluation, and potential indirect effects (visual, atmospheric, and auditory). The FAA determined that the revised Proposed Action, with the FAA RTR towers and electrical support building, would not affect historic resources. In a January 30, 2026 DHR email to the FAA, the DHR wrote, "Implementation of the undertaking [Proposed Action] in accordance with the finding of *No Historic Properties Affected* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act." See Section 3.2.8 and ***Appendix D*** for further details.

Therefore, compared to the No Action Alternative, the construction of the Proposed Action would not affect Section 4(f) or 6(f) resources

Operational – The operation of the Proposed Action would not physically use (directly impact) any Section 4(f) or Section 6(f) resources. Following construction, the proposed ATCT would be 120 tall and produce light emissions, all of which could affect the area's visual resources and/or visual character. To assess the visual effects of the Proposed Action, a Visual Effects Study was conducted, which included daytime and nighttime photo simulations of the proposed ATCT from various viewpoints (see ***Appendix E***).

The Visual Effects Study found that the Proposed Action would not be visible from Bristoe Station Battlefield Heritage Park. Additionally, the operation of the Proposed Action would not affect environmental resources (e.g., air quality, noise, etc.) in a manner that would indirectly affect (constructively use) Section 4(f) and 6(f) resources. As described in Section 3.2.8 of this EA, the DHR concurred that the Proposed Action (Replacement ATCT) resulted in a *No Adverse Effect* determination on historic resources. As described previously, the FAA determined that the revised Proposed Action, with the RTR towers and electrical support building, would not affect historic resources. In a January 30, 2026 DHR email to the FAA, the DHR wrote, "Implementation of the undertaking [Proposed Action] in accordance with the finding of *No Historic Properties Affected* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act." See Section 3.2.8 and ***Appendix D*** for further details. Therefore, compared to the No Action Alternative, the operation of the Proposed Action (replacement ATCT and FAA RTR) would not affect Section 4(f) or 6(f) resources.

Implementing the Proposed Action would cause a less than significant environmental effect on USDOT Section 4(f) or Section 6(f) resources. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – No mitigation is required since the Proposed Action would not physically or constructively use USDOT Section 4(f) or LWCFA Section 6(f) properties.

3.2.6 Farmlands

3.2.6.1 Affected Environment

The Direct Study Area (Replacement ATCT and FAA RTR) consists of four (4) different soil types: Elsinboro sandy loam, 2 to 7 percent slopes, Alden silt loam, 0 to 2 percent slopes, Panorama silt loam, 2 to 7 percent slopes, and Rowland silt loam, 0 to 2 percent slopes (see ***Figure 3-6***). The Elsinboro soil series is a well-draining, non-hydric soil classified as prime farmland that rarely floods. Aldin silt loam soils are poorly draining, hydric, non-prime farmland that occasionally floods. Panorama silt loam is a well-drained soil type that is listed as prime farmland soil.

Rowland silt loam, also classified as non-prime farmland, is a moderately well-drained on-hydric soil that frequently floods. ***Table 3-9*** provides a summary of soil information within the Direct Study Area based on information collected from the USDA NRCS Web Soil Survey database. However, throughout the Airport's development and in prior Airport construction projects in the Direct Study Area (FAA RTR), the soil has been considerably disturbed and currently contains fill material.

In addition, as shown in ***Figure 3-7***, the Direct Study Area is identified as an "urbanized area" on the U.S. Census Bureau (2020) map of Urban Areas.

TABLE 3-9: FARMLAND SOIL TYPES WITHIN THE DIRECT STUDY AREA

Soil Unit Name	Acres in Direct Study Area	Farmland Classification
Elsinboro sandy loam, 2 to 7 percent slopes	2.0	Prime Farmland
Alden silt loam, 0 to 2 percent slopes	1.7	Not Prime Farmland
Panorama silt loam, 2 to 7 percent slopes	0.3	Prime Farmland
Rowland silt loam, 0 to 2 percent slopes	0.2	Not Prime Farmland

Source: (USDA NRCS, 2024).

FIGURE 3-6: SOILS MAP

FIGURE 3-7: U.S. CENSUS BUREAU URBANIZED AREA AND THE DETAILED STUDY AREA

3.2.6.2 Environmental Consequences

Significance Threshold – Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for farmlands. A significant impact would occur when the total combined score on Form AD-1006, "Farmland Conversion Impact Rating," ranges between 200 and 260 points. Factors to consider that may be applicable to farmlands include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

Convert important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest, which are considered to be prime, unique, or of state or local importance.[10]

Potential Impacts

Construction - Construction of the Proposed Action would occur entirely on Airport property and would not require the acquisition or conversion of farmlands. Under the Farmland Protection Policy Act (FPPA) (7 U.S.C. §§ 4201-4209), land committed to urban development is not subject to provisions of the FPPA (7 CFR Part 658). Since the Direct Study Area does not contain land subject to the FPPA, completion of Form AD-1006 is not required, and farmland soil impacts would not occur.

Operational – The Proposed Action's operation would not affect farmland soil types.

Implementing the Proposed Action would not cause an environmental effect on farmlands. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant impact.

Mitigation Measures - No mitigation is required since the Proposed Action is exempt from the FPPA.

3.2.7 Hazardous Materials, Solid Waste, and Pollution Prevention

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. § 9601 et seq.) and Resource Conservation and Recovery Act (RCRA) (42 U.S.C. §§ 6901-6992k) broadly define "hazardous materials." According to the FAA (2023) *1050.1F Desk Reference*, a hazardous material is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and includes hazardous wastes and hazardous substances as well as petroleum and natural gas substances and materials. According to the RCRA, solid waste means any garbage,

[10] Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water) (7 CFR 657.5(a)).

refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities (42 U.S.C. §§ 6901-6992k). Pollution prevention includes methods to avoid, prevent, or reduce pollutant discharges or emissions because of a project.

3.2.7.1 Affected Environment

Hazardous Materials - According to the EPA NEPAssist tool, no hazardous waste facilities are within the Direct Study Area (U.S. Environmental Protection Agency, 2024). There are no superfund sites on the National Priorities List (NPL) within the Direct Study Area; the closest superfund site is Fairfax Mercury (Site ID: 0305614), located approximately 17 miles northeast of the Direct Study Area (U.S. Environmental Protection Agency, 2024) (see ***Appendix G***).

The City has developed a combined Stormwater Pollution and Prevention Plan (SWPPP) and Spill Prevention, Control, and Countermeasure (SPCC) Plan for the Airport, which complies with the Virginia Pollutant Discharge Elimination System Permit (VPDES) General Permit (VAR050985) issued to the City. The SPCC Plan establishes policies and procedures for handling, storing, disposing of, and cleaning up hazardous materials, including jet fuel, and identifies roles and responsibilities for spill response on Airport property.

Solid Waste and Pollution Prevention – American Disposal Services, Inc. manages the solid waste at the Airport. The closest landfill to the Airport is the Prince William County Landfill, located about 7.5 miles southeast of the Airport (Prince William County, 2024). The Prince William County Landfill is expected to reach capacity around 2065 (Prince William County Department of Public Works, 2022). The Airport's SWPPP contains measures to prevent contamination of surface waters as a result of stormwater runoff that may contain water polluting materials.

3.2.7.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F does not define a significance threshold for hazardous materials, solid waste, and pollution prevention; however, it does provide several factors to consider in evaluating the context and intensity of potential environmental impacts. FAA Order 1050.1F, Exhibit 4-1 states that these include when the action would have the potential to:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site, including but not limited to a site listed on the National Priorities List. Involve a contaminated site (including but not limited to a site listed on the National Priorities List). Contaminated sites may encompass relatively large areas. However, not all of the grounds within the boundaries of a contaminated site are contaminated, which leaves space for siting a facility on non-contaminated land within

the boundaries of a contaminated site. An EIS is not necessarily required. Paragraph 6-2.3.a [FAA Order 1050.1F] allows for mitigating impacts below significant levels (e.g., modifying an action to site it on non-contaminated grounds within a contaminated site). Therefore, if appropriately mitigated, actions within the boundaries of a contaminated site would not have significant impacts;

- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- Adversely affects human health and the environment.

Potential Impacts

Hazardous Materials

Construction – When compared with the No Action Alternative, construction of the Proposed Action would increase temporary on-Airport hazardous materials. This would predominantly be diesel fuel, which is necessary to operate construction equipment. The selected contractor would use and manage construction-related hazardous materials in accordance with the Airport's SPCC and the amended SWPPP (including the Proposed Action) and store hazardous materials at the construction staging areas. The selected contractor would be responsible for disposing of hazardous waste in accordance with all federal, state, and local rules and regulations. Hazardous waste is accepted for disposal at the following facilities in Prince William County and Spotsylvania County: Safety-Kleen Systems and Veolia Environmental Services (Prince William County, 2024). When the ATCT was relocated from its original location in Colorado to the Airport in 1991, the presence of any hazardous materials would have been remediated prior to transport. Electronic components would be removed and disposed of in accordance with federal, state, and local regulations prior to demolition. Therefore, the demolition of the current ATCT would not contain asbestos-containing material, lead-based paint, or other hazardous materials.

Operational – The operation of the Proposed Action would not change the type or quantity of hazardous materials used or stored at the Airport. All existing hazardous materials would continue to be used and stored per federal, state, and local rules and regulations. Compared to the No Action Alternative, the construction and operation of the Proposed Action would have no significant effect on hazardous materials.

Solid Waste and Pollution Prevention

Construction – Construction of the Proposed Action would cause a short-term, temporary increase in the quantity of solid waste generated at the Airport throughout construction from 2026 to 2027. Demolition of the existing ATCT would occur after the Proposed Action is fully operational. The Prince William County Landfill accepts limited construction and demolition

debris (Prince William County, 2024). In addition, the following facilities accept concrete, cleared vegetation (e.g., brush and woody debris), and/or general construction debris in Prince William County: Rainwater Topsoil & Recycles Concrete; Commonwealth Recycled Aggregate and Materials, Inc.; Waste Management Manassas Transfer Station; C&D Recovery LLC (Prince William County, 2024). Combined, these facilities have the capacity to accept solid waste from the demolition of the existing ATCT and the construction of the Proposed Action. The selected contractor would be responsible for disposing of solid waste in accordance with all federal, state, and local rules and regulations. The use of oil for the lubrication of construction equipment would be disposed of or recycled in accordance with federal, state, and local laws.

Tree clearing conducted on March 24 and March 29, 2025, left tree stumps and mulched branches and logs in place; no vegetation debris or solid waste was disposed of off-site.

Operational – Following construction, the replacement ATCT would not result in a greater increase in solid waste compared to the No Action Alternative because the replacement ATCT would operate similarly to the existing ATCT. Solid waste would continue to be handled and disposed of in accordance with federal, state, and local rules and regulations. Operation of the Proposed Action would not significantly affect local landfills. Therefore, the Proposed Action would have no significant effect on solid waste.

Implementing the Proposed Action would cause a less than significant environmental effect on Hazardous Materials, Solid Waste, and Pollution Prevention. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – The City would notify VDEQ of the Proposed Action before construction. The selected contractor would conduct all work in compliance with the City's VPDES General Permit (VAR050985) and amend the SWPPP to include the Proposed Action and SPCC Plan. As described previously, electronic components would be removed and disposed of in accordance with federal, state, and local regulations prior to demolition. If unanticipated hazardous materials are encountered during the construction of the replacement ATCT or demolition of the existing ATCT, the following measures could be implemented:

- Stop work and evacuate all personnel to a safe distance;
- Identify and assess materials discovered;
- Inform the City (i.e., Airport staff), emergency services or EPA; and
- Remediate and dispose per federal, state, and/or local regulations.

During VDEQ's review of the EA, it commented that all projects "implement pollution prevention principles, including:

- the reduction, reuse and recycling of all solid wastes generated; and
- the minimization and proper handling of generated hazardous wastes."

Pollution prevention principles will be implemented as applicable. The VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation and Hydrostatic Tests (VAG83) permit would be obtained if required.

Additional mitigation measures are not required or proposed.

3.2.8 Historical, Architectural, Archeological, and Cultural Resources

The principal federal law addressing historic properties is the National Historic Preservation Act (NHPA), as amended (54 U.SC. § 300101 et seq.). Section 106 of the NHPA (36 CFR Part 800 et seq.) requires a federal agency with jurisdiction over a proposed federal action to take into account the effects of the undertaking on historic properties and to consult with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers (THPO), and other parties to develop and evaluate alternatives or modifications to avoid, minimize, or mitigate adverse effects on historic properties.

For the purposes of Section 106, historic properties are defined as prehistoric and historic sites, buildings, structures, districts, landscapes, and objects that are either eligible for or listed in the NRHP, as well as artifacts, records, and remains related to such properties. Historic properties can also include those cultural resources that are associated with the cultural practices or beliefs of a living community (Advisory Council on Historic Preservation, 2021). Historic properties must demonstrate importance in history, architecture, archaeology, engineering, or culture by meeting one or more of the significance criteria identified under Section 106 (36 CFR Part 800 et seq.).[11] In addition to demonstrating significance, a historic property must demonstrate integrity.

3.2.8.1 Affected Environment

An Area of Potential Effects (APE) was established for this EA to represent the geographic area in which the Proposed Action may directly or indirectly cause alterations in the character or use of historic properties, if present. This EA's Direct APE is the 4.2-acre Direct Study Area.

A portion of the Direct APE (Replacement ATCT) (1.6 acres) overlaps with a Phase I archaeological resources survey previously completed in 2017. The 2017 Phase I archaeological resources survey did not identify any cultural resources within the portion of this EA's Direct APE (Elizabeth Anderson Comer Archaeology, 2017).

[11] The seven aspects of integrity include location, setting, design, materials, workmanship, feeling, and association.

A Phase I archaeological survey was conducted on the remaining 2.4 acres of the Direct APE (Replacement ATCT). Background research efforts included a literature review of cultural resources data in the Virginia Cultural Resources Information System (VCRIS) database, an examination of historic cartographic resources, and secondary-source research on the general environmental, pre-contact, and post-contact cultural/historical contexts that have shaped the development of the Manassas Regional Airport (see ***Appendix D***).

This EA's Phase I archaeological survey consisted of shovel testing at 15-m (49.2-ft) intervals on a grid pattern within the previously unsurveyed Direct APE (Replacement ATCT) and visual inspection of the entire Direct APE. No surface artifact deposits were encountered, and none of the 23 excavated shovel test pits yielded any cultural material or evidence for subsurface cultural features. Therefore, no archaeological resources were identified within the Direct APE (see ***Appendix D***).

As previously described, prior Airport construction projects in the Direct Study Area (FAA RTR), have considerably disturbed the ground and soils. Fill material was used in the Direct Study Area (FAA RTR) when the Airport was initially constructed, then graded during the construction of Observation Road and the interior service road, which included stormwater ditches and fencing.

This EA's Indirect APE is the approximate 1,690-acre Indirect Study Area (see ***Figure 3-1***). The Indirect APE is based on 2020 LiDAR data overlaid on aerial imagery where the expected visibility of the proposed ATCT replacement could occur from the ground. The Indirect APE addresses the historic architectural resources that could be indirectly affected by the Proposed Action (e.g., visual effects). Bristoe Station Battlefield (DHR Resource 076-0024 and 076-5036) is located within the project's Direct and Indirect APE. The DHR has identified the resource as potentially eligible for listing in the NRHP.

3.2.8.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F does not provide a significance threshold for historical, architectural, archeological, and cultural resources; however, it does provide a factor to consider in evaluating the context and intensity of potential environmental impacts. This would occur when the action would result in a finding of adverse effect through the Section 106 process.

Potential Impacts

Construction – Based on the Phase I archaeological survey, the construction of the Replacement ATCT, including tree clearing activities already performed, would not have any impact on historic, architectural, archaeological, or cultural resources listed in or eligible for the National Register of Historic Places. No further investigations are recommended. The FAA coordinated the submittal of a DHR *Project Review Application Form* for the Proposed Action. On April 16, 2025, the DHR Review and Compliance Division replied to the FAA's submittal, stating,

"Implementation of the undertaking [Proposed Action] in accordance with the finding of *No Adverse Effect* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act."

In the fall 2025, the Proposed Action was revised to include the FAA RTR towers and electrical support building located on Airport property, resulting in additional FAA to DHR coordination. On January 8, 2026, the FAA submitted a Section 106 coordination letter and accompanying Project Review Application Form to the DHR. The letter and supporting materials described the addition to the APE, the potential direct effects, alternative RTR locations and evaluation, and potential indirect effects (visual, atmospheric, and auditory). The FAA determined that the revised Proposed Action, with the RTR towers and electrical support building, would not affect historic resources. In a January 30, 2026 DHR email to the FAA, the DHR wrote, "Implementation of the undertaking [Proposed Action] in accordance with the finding of *No Historic Properties Affected* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act." .

Operational - The operation of the Proposed Action would not increase aircraft operations, change the aircraft fleet mix, or affect landside or airside operations. The Proposed Action would not be seen from the Bristoe Station Battlefield Heritage Park (see ***Section 3.2.12*** and ***Appendix E*** for further details). Therefore, the operation of the Proposed Action would not affect historic resources. As described above, the DHR concurred that the Proposed Action resulted in a *No Adverse Effect* determination on April 16, 2025 for the replacement ATCT site and a *No Historic Properties Affected* determination on January 30, 2026 for the FAA RTR towers and electrical support building.

Per FAA Order 1050.1F significance thresholds, the Proposed Action, when compared to the No Action Alternative, would not significantly affect historical, architectural, archeological, and cultural resources.

Implementing the Proposed Action would cause a less than significant environmental effect on Historical, Architectural, Archeological, and Cultural Resources. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures - Construction and implementation of the Proposed Action would not significantly impact historical, architectural, archeological, and cultural resources. Therefore, no mitigation is required or proposed.

3.2.9 Natural Resources and Energy Supply

The FAA Desk Reference states that this impact category provides an evaluation of a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, commercial space launch vehicles, or other ground vehicles). Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance. FAA Order 1053.1, Energy and Water Management Program for FAA Buildings and Facilities, consistent with the National Environmental Policy Act (NEPA) encourage the development of FAA facilities that exemplify the highest standards of design, including sustainability principles. All elements of the transportation system should be designed with a view to the conservation of energy and other resources, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public.

3.2.9.1 Affected Environment

Consumable materials are regularly used to maintain the Airport's various airside and landside facilities and services. These materials include asphalt, concrete, aggregate for sub-base materials, various metals associated with Airport maintenance, and fuels associated with the operation of aircraft and vehicles.

Electrical power is provided by Northern Virginia Electric Cooperative (NOVEC) to the Airport (Northern Virginia Electric Cooperative, 2024). Water and sewer services are provided by the Prince William County Service Authority (Prince William County Service Authority , 2024). Water is drawn from the Potomac River and Lake Manassas and is treated at either Fairfax Water's James J. Corbalis, Jr. Water Treatment Plant or the City of Manassas' water treatment plant (Prince William County Service Authority, 2024). Lake Manassas is located approximately seven miles northwest of the Direct Study Area, and the Potomac River is about 18 miles southeast of the Direct Study Area.

3.2.9.2 Environmental Consequences

Significance Threshold – FAA Order 1050.1F does not define a significance threshold for natural resources and energy supply; however, it does provide a factor to consider in evaluating the context and intensity of potential environmental impacts. Potentially significant effects could occur if the action would have the potential to cause demand to exceed available or future supplies of these resources, which include aviation and surface vehicle fuel, construction material, and electrical power.

Potential Impacts

Construction – When compared to the No Action Alternative, the construction of the Proposed Action would result in a temporary increase in the usage of natural resources. Construction activities associated with the construction of the Proposed Action include using aggregate, sub-

base materials, paving materials, building materials, ATCT materials, and utility connection materials. The replacement ATCT tower would be built to the FAA's new Sustainable Tower Design Initiative. This initiative solicited a sustainable and adaptable design for air traffic control towers to be used at municipal and smaller airports across the country in order to meet key sustainability requirements. The ATCT's sustainability measures include materials and products free from chemicals known to pose health risks and high-recycled steel and metal products (FAA, 2024). Construction of the Proposed Action would not require large volumes of natural resources that are rare or in short supply in the Manassas region. Resources required for the construction of the Proposed Action are not rare or in short supply, and the quantity required for development of this size would not place an undue strain on supplies within the Manassas region. Construction of the Proposed Action would temporarily increase the usage of energy supplies; however, when compared to the No Action Alternative, the increase would be temporary and minor and be within the capacities of NOVEC. Trucks and construction equipment would consume fuel as needed during construction. Demolition of the existing ATCT would require the consumption of some natural resources to fuel and power the machinery. These energy supplies are not rare or in short supply in the Manassas region.

Operational Impacts – The operation of the Proposed Action could increase electricity and water use at the Airport. The replacement ATCT tower would be built according to the FAA's new Sustainable Tower Design Initiative, leading to the replacement ATCT being more energy efficient than the existing ATCT. To improve operational efficiency, the adaptable design includes all-electric building systems and a thermally efficient façade, as well as features such as renewable mass timber when usable. The adaptable design has standardized elements to reduce construction and operational costs while allowing for the replacement ATCT to be tailored to the local climate and location issues such as high winds, wet and dry environments, and very high and low temperatures, and increases efficiency (FAA, 2024). Compared to a No Action Alternative, the Proposed Action would have similar staffing (approximately 3-4 persons per shift – daytime and nighttime). Fluctuations in ATCT staff would occur each year due to trainees. Qualitatively, the Proposed Action has the potential for a few additional staff/trainees (an additional 3-4 staff personnel/trainees). Therefore, the operation of the Proposed Action would increase fuel use at the Airport compared to the No Action Alternative. However, the Proposed Action would not increase the aviation fuel use at the Airport.

Per FAA Order 1050.1F significance thresholds, the Proposed Action, when compared to the No Action Alternative, would not significantly affect natural resources and energy supply.

Implementing the Proposed Action would cause a less than significant environmental effect on Natural Resources and Energy Supply. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – The Sustainable Tower Initiative proposes a sustainable and adaptable design for air traffic control towers that would increase efficiency and thereby reduce the need for natural resources and energy. Therefore, construction and implementation of the Proposed Action would not significantly impact natural resources and energy supply, and mitigation is not required or proposed.

3.2.10 Noise and Noise Compatible Land Use

Per guidance within the FAA 1050.1F Desk Reference, noise is considered an unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Aviation noise primarily results from the operation of fixed and rotary wing aircraft, such as departures, arrivals, overflights, taxiing, and engine run-ups. Noise is often the predominant aviation environmental concern of the public. Aircraft noise in communities around airports historically generated most of the noise issues. Since the issuance of the Aviation Noise Abatement Policy, the FAA has used the DNL 65 dB threshold for reducing noise impacts, and the EPA identifies day/night average sound level (DNL) as the principal metric for airport noise analysis. Federal regulations on airport noise compatibility planning (14 CFR Part 150) sets forth standards for airport operators to use when documenting noise exposure around airports and for establishing programs, subject to FAA approval, to reduce noise-related noncompatible land use. A "noncompatible land use" is a land use (such as residential, schools, and churches) exposed to aircraft noise above established thresholds. The FAA requires DNL as the noise descriptor in aircraft noise exposure analysis and noise compatibility planning. DNL levels are commonly shown as lines of equal noise exposure, similar to terrain contour maps, referred to as noise contours.

3.2.10.1 Affected Environment

Rural and residential land uses near the Airport and within the Indirect Study Area[12] are sensitive to aircraft noise associated with the Airport. However, most of the development around the Airport is industrial and commercial. The designated noise-sensitive area east and south of the Airport is not within the existing DNL 65 dBA noise contour (City of Manassas, 2024). The Airport promotes following a Voluntary Good Neighbor Noise Abatement Program. The Voluntary Good Neighbor Noise Abatement Program is comprised of suggestions for pilots, fixed-base operators, and maintenance facilities. It is recognized that the FAA ATCT and pilots are the ultimate decision-makers in conducting safe flight operations. When permitted, the Airport's users and tenants are encouraged to follow the guidelines of this program. In part, the Airport advises all flight operations that the preferred way to avoid the noise-sensitive area

[12] The Indirect Study Area (see Figure 3-1) is based on 2020 LiDAR data overlaid on aerial imagery where the expected visibility of the proposed ATCT replacement could occur from the ground. The Indirect Study Area addresses the resource categories that could be indirectly affected by the Proposed Action, such as noise-sensitive land uses.

is to follow major roads and railroad tracks near the Airport (City of Manassas, 2024). Other program recommendations include, but are not limited to:

- Flight instructors should teach their students about these noise abatement procedures.
- Pilots should follow preferred departure and arrival routes for aircraft
- Helicopter traffic should climb to a pattern altitude of 1,000 FT MSL prior to crossing the Airport boundary.
- Routes are to be used to avoid noise-sensitive areas surrounding the Airport.
- Maintenance engine run-ups in designated areas are restricted to the hours of 7:00 AM to 10:00 PM, Monday through Sunday.
- When a noise complaint is received, the Airport will document it in a noise complaint log and respond to the person who filed the complaint.

3.2.10.2 Environmental Consequences

Significance Threshold – FAA Order 1050.1F identifies the "significant impact" threshold based on the yearly DNL and compatible land-use standards found at 14 CFR Part 150, *Airport Noise Compatibility Planning*, specifically Table 1 in Appendix A of that regulation (see ***Table 3-10***). FAA Order 1050.1F states that there is a significant noise impact with respect to aircraft noise if an increase in noise of DNL 1.5 dB or more for a noise-sensitive area (one exposed to noise at or above the DNL 65 dB noise exposure level) or that would 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.

For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB. The determination of significance must be obtained using noise contours and/or grid point analysis along with local land use information and general guidance contained in Appendix A of 14 CFR Part 150.

TABLE 3-10: FAA LAND USE COMPATIBILITY GUIDELINES – 14 CFR PART 150

Land Use	DNL Expressed in dB(A)					
	Below 65	65-70	70-75	75-80	70-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N

Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Table Notes: SLUCM=Standard Land Use Coding Manual. Y (Yes) = Land Use and related structures compatible without restrictions. N (No) = Land Use and related structures are not compatible and should be prohibited. NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

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

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems. (2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low. (3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low. (4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low. (5) Land use compatible provided special sound reinforcement systems are installed. (6) Residential buildings require an NLR of 25. (7) Residential buildings require an NLR of 30. (8) Residential buildings not permitted.
Source: 14 CFR Part 150

In addition to defining significant impacts, FAA Order 1050.1F includes additional reporting requirements, including:

- The location and number of noise-sensitive uses at or above DNL 65 dB;
- The disclosure of potentially newly non-compatible land use, regardless of whether there is a significant noise impact and
- Maps reporting the number of residences or people residing at or above DNL 65 dB for at least the 65-, 70-, and 75-dB exposure levels.

FAA Order 1050.1F states, “Special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR Part 150 are not relevant to the value, significance, and enjoyment of the area in question.” For example, the DNL 65 dB threshold does not adequately address the impacts of noise on visitors to areas within a national park or national wildlife and waterfowl refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

Levels of changes for noise-sensitive locations include:

- Significant noise impact: DNL increase of 1.5 dB or more in areas of 65 dB DNL and higher
- DNL increase of 3 dB or more in areas between DNL 60 and 65 dB
- DNL increase of 5 dB or more in areas between DNL 45 and 60 dB

Potential Impacts

Construction-related Noise – The Proposed Action's construction involves temporarily using heavy machinery, equipment, and construction activities that would generate noise. The intensity and duration of construction noise can vary depending on specific construction activities and equipment used. Construction noise could occur during various times of the day, including daytime, evenings, and potentially nighttime, depending on the construction schedule and local regulations. Tree clearing for the geotechnical survey was conducted during the daytime on March 24 and March 29, 2025. The replacement ATCT would start construction in 2026 and be operational in 2028. After the replacement ATCT is operational, the existing ATCT would be demolished and transferred to area landfills.

The potential impact of construction noise can be influenced by the local environment and the sensitivity of nearby communities. Noise-sensitive areas, such as residential neighborhoods, hospitals, or schools, could be more affected by construction noise. Vegetation and man-made structures can reduce noise exposure. The nearest noise-sensitive area is a residential area about 0.25 mile south of the Direct Study Area (Replacement ATCT). It is buffered by approximately 1,300 feet of dense vegetative growth. Construction of the Proposed Action would involve the use of equipment that would generate temporary construction-related noise for the duration of construction. The loudest noise from construction equipment would include the use of front loaders, backhoes, and dozers. The maximum sound level at 50 feet away from the construction equipment would be 80 dB from front loaders, 80 dB from backhoes, and 85 dB from dozers (FHWA, 2024). Using a standard noise drop-off rate of 6 dB per doubling of distance, temporary construction noise levels calculated at the closest residential area would be 52 dB from front loaders, 52 dB from backhoes, and 57 dB from dozers. Normal background sound levels in residential/suburban areas range from 45-55 dB. Therefore, when compared to the No Action Alternative, the construction of the Proposed Action would not affect noise-sensitive areas.

Operational – The operation of the Proposed Action would not change the Airport's current noise DNL 65dB noise contour. The operation of the Proposed Action would not change the Airport's current operations, aircraft fleet mix, or runway use percentages. Therefore, when compared to the No Action Alternative, the operation of the Proposed Action would not affect noise-sensitive areas.

Implementing the Proposed Action would cause a less than significant environmental effect on Noise and Noise Compatible Land Use. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures - The Proposed Action would not have a significant impact on noise-sensitive areas; therefore, no mitigation is proposed.

3.2.11 Socioeconomics and Children's Environmental Health and Safety Risks

Per guidance within the FAA (2015) 1050.1F Desk Reference, this section evaluates the potential for the Proposed Action to affect socioeconomics, and children's environmental health and safety risks.

Socioeconomics – Socioeconomics is an umbrella term that describes a project's social or economic aspects or a combination of the two. A socioeconomic analysis evaluates how elements of the human environment, such as population, employment, housing, and public services, might be affected by a proposed action and alternative(s). The Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 (42 U.S.C. § 4601 et seq.) is the primary federal regulation governing socioeconomics. It includes provisions that must be followed if property acquisition or displacement of people would occur resulting from the proposed action.

Children's Environmental Health and Safety Risks – Areas of particular concern for children's environmental health and safety risks include schools, daycare facilities, children's health clinics, and child-friendly recreational facilities. Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks 62 Federal Register 19885 (April 21, 1997), federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risk and safety risks that may disproportionately affect children.

3.2.11.1 Affected Environment

Socioeconomics – Population, housing, and labor force data for the City of Manassas and Prince William County is included as the basis for evaluating potential socioeconomic impacts.

Population **– *Table 3-11*** lists the population growth from 2010 to 2020 in the census tract containing the Direct Study Area and the City, County, State, and U.S. for comparison purposes. Between 2010 and 2020, the population in and around the Project Study Areas increased by an average of 22.5% while the surrounding City, Prince William County, the State of Virginia, and the United States increased at a slower rate (U.S. Census Bureau, 2020).

TABLE 3-11: POPULATION CHANGE BETWEEN 2010 AND 2020

Area	2010	2020	Percent Change
Census Tract 9104.02	4,990	6,112	22.5%
City of Manassas	37,821	42,772	13.1%
Prince William County	402,002	482,204	20.0%
State of Virginia	8,001,024	8,631,393	7.9%
United States of America	308,745,538	331,449,281	7.4%

Source: (U.S. Census Bureau, 2020) (U.S. Census Bureau, 2020)

Transportation – As shown in ***Figure 3-1***, the primary arterial roads to the Airport are Prince William Parkway (State Highway 234), located east of the Airport, and Nokesville Road (State Highway 28), north of the Airport. The roads that provide direct access to the Airport include Harry J Parrish Boulevard, Wakeman Drive, and Observation Road. Passengers, tenants, and employees use these roads to access the Airport's facilities (passenger terminal, tenant facilities, and hangars).

Housing - ***Table 3-12*** lists the total vacant housing units in Census Tract 9104.2 and surrounding communities. An average of 2.7% of housing units in the Census Tract and City, and 3.0% of housing units in the County are vacant in the referenced Census Tract.

TABLE 3-12: HOUSING UNITS

Area	Total Units	Vacant Units (percentage)
Census Tract 9104.02	2,171	2.7%
City of Manassas	14,365	2.7%
Prince William County	158,525	3.0%
State of Virginia	3,618,247	10.4%
United States	140,498,736	9.7%

Note: The U.S. Census Bureau considers vacant housing units for rent; rented but not occupied; or sale; sold but not occupied; for seasonal, recreational, or occasional use; for migrant workers; and other vacant units.

Source: (U.S. Census Bureau, 2024), (U.S. Census Bureau, 2024) (U.S. Census Bureau, 2022)

Labor Force – The U.S. Census Bureau lists 21,885 employed civilians in the City, containing the Direct Study Area. The unemployment rate averages about two percent in the City of Manassas (U.S. Census Bureau, 2024). The unemployment rate in the County is approximately two percent (FRED Economic Data, 2024).

Economic Impact – The Airport plays a significant role in the region's economy as being the busiest General Aviation airport in Virginia. The Airport drives economic activity by creating jobs, supporting business growth, and connecting Manassas and northern Virginia to the global market. The Airport's economic significance has led to $375 million being contributed to the local economy (City of Manassas, 2024).

Children's Environmental Health and Safety Risks - The nearest locations where children are likely to congregate are outside of the Indirect Study Area, specifically, Nanda Learning Day

Care Center and Cannon Branch Fort Park, located about 1.1 miles north and northeast of the Indirect Study Area, respectively (City of Manassas, 2024).

3.2.11.2 Environmental Consequences

Significance Threshold

Socioeconomics - FAA Order 1050.1F does not provide a significance threshold for socioeconomics. It provides several factors to consider when evaluating the context and intensity of potential environmental effects. Those factors to consider include the potential of the action 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 communities
- Produce a substantial change in the community tax base

Children's Environmental Health and Safety Risks - The FAA has not established a significance threshold pertaining to impacts on children's environmental health and safety in FAA Order 1050.1F; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for children's environmental health and safety. The factor to consider that may be applicable to children's environmental health and safety include but are not limited to, situations in which the proposed action or alternative(s) would have the potential to lead to a disproportionate health or safety risk to children.

Potential Impacts

Socioeconomics – The Proposed Action would positively affect employment by creating a temporary demand for construction employees. However, based on fluctuations in ATCT staff, the Proposed Action could result in the potential for a minimal 3-4 additional staff personnel/trainees to operate the ATCT compared to the No Action Alternative. Existing residents in the greater Manassas area would likely fill temporary employment positions.

The 2024 Virginia Department of Transportation (VDOT) Bidirectional Volume Data (BVD) was accessed and reviewed for roadways accessing the Airport (i.e., Piper Lane and Harry J. Parrish Boulevard; Gateway Boulevard data was not available). According to the VDOT BVD records, Piper Lane (from Nokesville Road to Norfolk Southern Railroad) had an annual daily traffic (ADT) count of 3,100 vehicles. Harry J Parrish Boulevard (from Clover Hill Road to Wakeman Drive (i.e., Airport entrance)), the ADT was 2,100 (VDOT, 2024).

As previously described, the Proposed Action's construction would cause a minor temporary increase in surface vehicles using area roadways to access the construction site (i.e., approximately 8 construction-related vehicles (e.g., cement mixers, dump trucks, and tractor-trailers) and 45 construction employee-related vehicles) duration construction from 2026 to 2027.

The trips to the project site for construction vehicles could range from 20 to 45 vehicles depending on which project component is being constructed (ATCT, support building, parking lot, FAA RTR towers, electrical building). The construction vehicle trips are assumed to arrive at the construction site in the morning and depart in the afternoon. Assuming an even distribution of vehicles along Piper Land and Harry J Parrish Blvd, the percentage increase in ADT would be 0.73% and 1.1%, respectively. This temporary increase in construction-related vehicles would not affect the level of service for these roadways. Therefore, construction-related impacts would be temporary and are not expected to cause a significant secondary (induced) impact on the surrounding area.

The Proposed Action would not cause shifts in the projected population growth, change population movement, or result in the need for extensive relocations. The Proposed Action does not anticipate increasing the demand for fire, police, and life safety services. Compared to the No Action Alternative, the Proposed Action would not disrupt any nearby surrounding communities of any planned development or relocate community businesses, and it would be consistent with the plans and goals of the community. Therefore, when compared to the No Action Alternative, the Proposed Action would have no significant effect on socioeconomics.

Children's Environmental Health and Safety Risks - The Direct Study Area is located entirely on Airport property and would, therefore, have no direct impact on schools, daycares, children's health clinics, or child-friendly recreational facilities. Construction noise levels calculated at the Nanda Learning Day Care Center and Cannon Branch Fort Park would temporarily be 39 dB from front loaders, 39 dB from backhoes, and 44 dB from dozer operations Given the distance of the Direct Study Area to land uses related to children, the Proposed Action would not have the potential to lead to a disproportionate health or safety risk to children.

Implementing the Proposed Action would cause a less than significant environmental effect on Socioeconomics and Children's Environmental Health and Safety Risks. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – The City does not propose mitigation measures because the Proposed Action would not cause significant direct or indirect effects on socioeconomic or children's environmental health and safety risks.

3.2.12 Visual Effects

Per guidance within the FAA (2023) 1050.1F Desk Reference, visual effects deal broadly with the extent to which the proposed action or alternative(s) would either 1) produce light emissions that create an annoyance or interfere with activities, or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. In keeping with FAA (2023) *1050.1F Desk Reference*, the following sections are separated into Light Emissions and Visual Resource and Visual Character sections.

- Light emissions include any light that emanates from a light source into the surrounding environment.
- Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics.
- Visual character refers to the overall visual makeup of the existing environment where the proposed action and alternative(s) would be located.

Although there are no special purpose laws or requirements specific to light emissions or visual effects, some visual resources are protected under federal, state, or local regulations, such as Section 106 of the NHPA, Section 4(f) of the DOT Act, the Wild and Scenic Rivers Act, and the Coastal Zone Management Act.

3.2.12.1 Affected Environment

The Direct Study Area (Replacement ATCT and FAA RTR) is located on the west side of the Airport. The viewshed of the Direct Study Area (Replacement ATCT and FAA RTR) includes Airport facilities such as runways, taxiways, aprons, buildings, hangars, parking lots, access roads, and the existing ATCT as well as industrial development (e.g., warehouses, Virginia Railway Express station and vehicle parking). Grass turf surrounds all paved airfield facilities. Existing light emissions within the viewshed of the Direct Study Area include lighting to the airfield (e.g., runways, taxiways, and aprons) and on the outside of airside and landside buildings and off-Airport industrial development.

The undeveloped portions of the Direct Study Area (Replacement ATCT and FAA RTR) include approximately 0.3-acre of mowed and maintained grass, 2 acres of forest habitat and 1 acre of cleared forest with remaining stumps and mulched logs/branches onsite. Dense vegetation consisting of deciduous trees and shrubs surrounds and mostly blocks views of the Direct Study Area from viewpoints to the south, west, and northwest. The closest residential area is to the Direct Study Area (Replacement ATCT) which is about 0.25 mile south. It is buffered by approximately 1,300 feet of dense vegetative growth.

A Visual Effects Study was conducted for the Proposed Action (Replacement ATCT). Daytime and nighttime ATCT photo simulations were developed west of the Airport from various

viewpoints in coordination with the FAA (see ***Appendix E***). A viewshed analysis and refined visual effects analysis for the FAA RTR were also conducted.

Four locations were selected for the visual effects analysis of the Proposed Action, which were:

- Bristoe Station Battlefield Heritage Park (highest point)
- Bristow Rd/Meadow Lane
- Split Oak Lane (worst case)
- Bristow Road/Centerville Sod

3.2.12.2 Environmental Consequences

Significance Threshold - FAA Order 1050.1F does not define a significance threshold for visual effects; however, Exhibit 4-1 of the Order provides a number of factors to consider in evaluating the context and intensity of potential environmental impacts.

For light emissions, these factors include the degree to which the action would have the potential to:

- "Create annoyance or interfere with normal activities from light emissions; and
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources."

FAA Order 1050.1F does not provide a significance threshold for visual resources and character; however, it does provide factors to consider in evaluating the context and intensity of potential environmental impacts. For visual resources/visual character, these include the extent to which the action would have the potential to:

- "Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations."

Potential aesthetic effects of an action are generally assessed by comparing the visual characteristics of the proposed development to existing development in the areas and to the environmental setting and by determining if a jurisdictional agency considers this contrast objectionable. The visual effects resulting from constructing and operating the Proposed Action would result from physical changes to the visual character of the Direct Study Area, including existing development, landforms, vegetation, and water surfaces.

Potential Impacts

Construction – Demolition of the existing ATCT and the construction of the Proposed Action would change the viewshed of the Airport and local area. Construction of the Proposed Action would involve the use of cranes and other construction equipment that could be seen by the surrounding community. However, using construction equipment would be temporary and only

last for the duration of construction. Changes to visual resources and visual character from the construction of the replacement ATCT and removal of the existing ATCT would not affect or obstruct visually important resources. Due to the small scale of the FAA RTR towers and electrical support building, existing terrain, and the height of trees in view, the construction of the Proposed Action FAA RTR towers would not be visible from the four locations selected for the visual effects analysis.

Operational - The operation of the Proposed Action would change the viewshed of the local area due to the new location of the replacement ATCT and FAA RTR towers, which would be 120 feet tall and 70 feet tall, respectively, and produce light emissions. Under the No Action Alternative, the existing ATCT is not visible to the surrounding areas due to its shorter height (the cab floor is 82 feet above ground level). The clearing and grubbing of trees under the Proposed Action would not be visible from the south, west, and northwest viewpoints because the surrounding forest blocks the view. From the north, east, and southeast, the cleared area may be only slightly noticeable against the forest backdrop and obstructed by existing airside development (GA hangars).

A Visual Effects Study was conducted to assess the potential visual effects of the relocated ATCT. The assessment included creating photo simulations using 3D models and lighting data to depict daytime and nighttime views of the proposed ATCT from four viewpoints (refer to ***Appendix E***). Refer to ***Figure 3-8*** for an example of the viewshed change from Bristow Road/ Meadow Lane during the day. The results of the Visual Effects Study are the Proposed Action:

- would emit artificial light (e.g., exterior lighting for the safety and security of vehicles and people, and a rotating beacon and red obstruction lighting atop the ATCT for aircraft operations) that could be visible in the Indirect Study Area but would not illuminate surrounding areas.
- would change the viewshed but would not affect the nature of the area's visual character, including importance, uniqueness, and aesthetic value.
- would contrast with the visual resources and/or visual character or resources west of the Airport.
- would not block nor obstruct the view of visual resources.

In addition, a preliminary viewshed analysis using Google Earth and a refined visual effects analysis using LiDAR data and 3D Max software were conducted to evaluate the potential visibility of the Proposed Action's FAA RTR site from surrounding areas.

Based on the visual effects analysis, the Proposed Action (Replacement ATCT and FAA RTR) would not be seen from the Bristoe Station Battlefield Heritage Park. However, the Proposed Action (Replacement ATCT) could potentially introduce a new visual element that may not seamlessly blend with the No Action Alternative's visual character of the surrounding areas, particularly those west of the Airport. This contrast would arise from factors such as the

Proposed Action's height, design, and lighting, which might change the backdrop of the surrounding landscape when compared to a No Action Alternative. As described in Section 3.2.8 of this EA, the DHR concurred that the Proposed Action (Replacement ATCT) resulted in a *No Adverse Effect* determination on historic resources.

On January 8, 2026, the FAA submitted a Section 106 coordination letter and accompanying Project Review Application Form to the DHR. The letter and supporting materials described the addition to the APE, the potential direct effects, alternative FAA RTR locations and evaluation, and potential indirect effects (visual, atmospheric, and auditory). The FAA determined that the revised Proposed Action, with the FAA RTR towers and electrical support building, would not affect historic resources. In a January 30, 2026 DHR email to the FAA, the DHR wrote, "Implementation of the undertaking [Proposed Action] in accordance with the finding of *No Historic Properties Affected* as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act." Therefore, compared to the No Action Alternative, the construction of the Proposed Action would not result in a visual effect. See Section 3.2.8 and ***Appendix D*** and ***Appendix E*** for further details.

The Proposed Action would be designed to be visually compatible with the existing Airport facilities. The Airport's existing rotating beacon, located on the opposite side of the airfield and across Wakeman Drive from corporate hangar development, will be relocated to the top of the replacement ATCT. According to the FAA's Technical Operations Communication group, one RTR antenna is recommended to be 50 feet above ground, and the other two antennas at 70 feet above ground for the best coverage. Red obstruction lighting system for aircraft operations would be located atop the replacement ATCT and FAA RTR towers and would be designed to meet FAA standards (FAA AC 70/7460-1M).

The relocated rotating beacon would not result in excessive light pollution or create a negative impact on the visual character of the area. While red obstruction lighting, designed to meet FAA standards, is a distinguishing marker, it does not illuminate objects on the ground. Replacement ATCT lighting designs could include shielding outdoor lighting fixtures to focus light emission on specific areas, using light-colored exteriors to reduce the amount of artificial light needed outdoors, or using light-emitting diode (LED) lights or lower color temperature interior lighting (i.e., warmer light). The changes in lighting are not anticipated to affect the visual nature of the existing developed area and the existing lighting present.

Although the proposed replacement ATCT would be taller than the existing ATCT, it would change the viewshed but would not affect the nature of the area's visual character due to the study area being an existing and active airport. In addition, a preliminary viewshed analysis using Google Earth and a refined visual effects analysis using LiDAR data and 3D Max software were conducted to evaluate the potential visibility of the Proposed Action's FAA RTR site, including red obstruction lighting, from surrounding areas.

FIGURE 3-8: VISUAL SIMULATION – BRISTOW ROAD/MEADOW LANE EXISTING VS. PROPOSED

Source: RS&H, Inc. 2024

Based on the location of the FAA RTR towers, the majority of the viewshed that could view the towers would be on Airport property (i.e., east and southeast of the tower locations). Due to varying terrain, areas west of the FAA RTR towers were primarily visible from tree tops and not from ground level (other than the railway express parking area adjacent to Observation Road). While the Proposed Action may introduce some degree of visual change, the efforts to design and implement the project would minimize any negative impacts on the nature of the area's visual character.

In addition, the existing ATCT would be decommissioned and demolished. During this time, the visual character of the Airport may experience a change with the removal of the existing ATCT and associated structures, resulting in minor effects on the visual landscape. Impacts from the removal of an existing ATCT to the visual landscape from changes to lighting would be minimal due to the insignificant change in ambient light. The Proposed Action's lighting conditions would remain generally consistent with the No Action Alternative. Therefore, the Proposed Action's potential light emissions are expected to be negligible by comparison.

Therefore, when compared to the No Action Alternative, the operation of the Proposed Action (including the demolition of the existing ATCT) would not significantly affect light emissions or visual resources and/or visual character within the Indirect Study Area.

Implementing the Proposed Action would cause a less than significant environmental effect on Visual Effects. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures – The City does not propose mitigation measures because the Proposed Action would not cause significant effects on the nature of the area's visual resources and/or visual character, including the importance, uniqueness, and aesthetic value of the affected visual resources.

The proposed replacement ATCT lighting designs to reduce light emissions could include shielding outdoor lighting fixtures to focus light emission on specific areas (e.g., parking areas or sidewalks), using light-colored exteriors to reduce the amount of artificial light needed outdoors, or using LED lights or warmer interior lighting (i.e., warmer light).

3.2.13 Water Resources

Per guidance within the FAA (2015) 1050.1F Desk Reference, water resources include wetlands, floodplains, surface waters, groundwater, and Wild and Scenic Rivers. As described at the beginning of this chapter, there are no Wild and Scenic Rivers that could be directly or indirectly impacted by the Proposed Action; therefore, this section does not discuss that resource category.

Wetlands – According to the EPA, wetlands are "areas where water covers the soil, or is present either near the surface of the soil all year or for varying periods of time during the year, including the growing season." The 1972 Clean Water Act (CWA) is the primary federal law that authorizes the EPA and the states to regulate water quality (33 U.S.C. § 1251 et seq.). Section 404 of the CWA requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), for the discharge of dredged or fill material into all waters of the United States, including jurisdictional wetlands (U.S. Environmental Protection Agency, 2024). Section 401 of the CWA requires water quality certification to ensure a project does not violate State or Tribal water quality regulations (U.S. Environmental Protection Agency, 2024).

Under the CWA, wetlands are defined as areas that, under normal circumstances, support a prevalence of vegetation typically adapted for life in saturated soil conditions. Per the USACE (1987) wetland delineation manual, the following three parameters must be present for an area to meet the definition of a wetland: (1) hydrophytic vegetation, (2) hydric soil, and (3) hydrology.

Executive Order 11990, *Protection of Wetlands* (1977), requires federal agencies to "avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

Floodplains – The Federal Emergency Management Agency (FEMA) considers "any land area susceptible to being inundated by floodwaters of any source" a floodplain (FEMA, 2011). The National Flood Insurance Act of 1968 (42 U.S.C. § 4001 et seq.) established the National Flood Insurance Program, administered by FEMA, to minimize flood damage within special flood hazard areas. Special flood hazard areas have a 1-percent chance of flooding within a given year, also referred to as the base flood or 100-year floodplain, and are delineated on FEMA maps, known as Flood Insurance Rate Maps (FIRM). Communities or entities insured under the National Flood Insurance Program must follow the program's floodplain management regulations for development placed within these flood hazard areas.

Executive Order 11988, *Floodplain Management* (1977) directs federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. To accomplish this goal, the order bans activities in a floodplain unless no practicable alternative exists or measures are incorporated into the proposed activity to minimize adverse impacts on the floodplain's natural and beneficial values.

U.S. DOT Order 5650.2, *Floodplain Management and Protection,* contains policies and procedures for carrying out Executive Order 11988 (U.S. Department of Transportation, 1979). If a proposed action involves development within a floodplain, the environmental analysis must

indicate whether the encroachment would be "significant," specifically, whether it would cause one or more of the following impacts: 1) the action would have a considerable probability to cause the loss of human life; 2) the action would likely result in substantial encroachment-associated costs or effects, including the interruption of aircraft service or the loss of a vital transportation facility (e.g., flooding a runway or taxiway or removing an important navigational aid from service due to flooding); or 3) the action would cause notable adverse impacts on natural and beneficial floodplain values.

A Flood Hazard Use Permit from Prince William County is required for all work within the floodplain and/or floodway (Prince William County, 2024).

Surface Water – The Virginia Department of Environmental Quality (DEQ) defines surface waters as "all waters that are not groundwater as defined in Code of Virginia 62.1-255." Section 303 of the CWA requires states to adopt water quality standards approved by the EPA for all surface waters of the United States, including lakes, rivers, and coastal wetlands (33 U.S.C. § 1251 et seq.). It is based on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit. Permit review is the CWA's primary regulatory tool. As defined by the CWA, water quality standards consist of the designated beneficial uses of the water body (e.g., wildlife habitat, agricultural supply, fishing, etc.) and criteria that protect the designated uses. Water quality criteria are prescribed concentrations, or levels, of constituents – such as lead, suspended sediment, and fecal coliform bacteria – or narrative statements, which represent the quality of water that supports a particular use.

As part of the CWA, when monitoring data indicate that a concentration level for a pollutant has been exceeded, the receiving water is classified as impaired and placed on the CWA Section 303(d) List of Water Quality–Limited Segments Requiring Total Maximum Daily Loads (TMDLs), which is then developed for the pollutant(s) that caused the impairment. A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (plus a "margin of safety"). The purpose of the TMDL is to limit the volume of pollutants discharged into the receiving water from all sources (i.e., stormwater runoff, wastewater, agriculture).

The National Pollutant Discharge Elimination System (NPDES) was established per 1972 amendments to the CWA to control discharges of pollutants from point sources. The 1987 amendments to the CWA created a section devoted to stormwater permitting (Section 402[p]) and permits individual states to administer and enforce the provisions of the CWA. As such, the state of Virginia administers and enforces the NPDES program through the Virginia Pollutant Discharge Elimination System (VPDES).

Groundwater - Per guidance within the FAA (2023) 1050.1F Desk Reference, "groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term

aquifer is used to describe the geologic layers that store or transmit groundwater to wells, springs, and other water sources."

Federal activities affecting groundwater are primarily governed by the Safe Drinking Water Act, which prohibits any federal agency from funding actions that would contaminate an EPA-designated Sole Source Aquifer or its recharge areas (42 U.S.C. § 300 et seq.). Potential impacts to a Sole Source Aquifer would require the FAA to consult with the EPA regional office, Tribal, state, or local officials.

3.2.13.1 Affected Environment

The following sections describe the existing conditions for wetlands, floodplains, surface water, and groundwater.

Wetlands – As shown in ***Figure 3-9***, the USFWS National Wetlands Inventory (NWI) identified Freshwater Forested/Shrub wetlands associated with Broad Run along the southwest portion of the Direct Study Area (Replacement ATCT) (U.S. Fish and Wildlife Service, 2024). There are no wetlands identified in the Direct Study Area (FAA RTR).

A wetland survey was performed in April 2024 within the Direct Study Area (Replacement ATCT) employing technical methods outlined in the USACE (1987) *Army Corps of Engineers Wetlands Delineation Manual* and the USACE (2012) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region*. No wetlands were identified within the footprint of the Proposed Action for the replacement ATCT (see ***Appendix C***). The wetland survey information was transmitted to the USACE for review and comment on October 29, 2024. Multiple inquiries were made to acquire the USACE's input regarding the lack of wetlands in the Direct Study Area. As of February 2026, the USACE has not replied to the information submitted.

Floodplains - According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the Direct Study Area (Replacement ATCT) is located within the FIRM Panels 51153C0157D and 51153C0159D (Federal Emergency Management Agency, 2024). The majority of the Direct Study Area (Replacement ATCT) is located within Zone AE of the 100-year floodplain (approximately 2.9 acres)(see ***Figure 3-10***). FEMA established water surface elevations for 10-, 50-, 100-, and 500-year floods and floodway for Broad Run with the USACE Hydrologic Engineering Center River Analysis System (HEC-RAS) model. The Direct Study Area (FAA RTR) is not located in a 100-year floodplain (i.e., Zone X).

Surface Water - The Project Study Areas are within the Rocky Branch-Broad Run Watershed (HUC12: 020700100504) (U.S. Environmental Protection Agency, 2024). Broad Run, a perennial stream, flows southward through the Indirect Study Area and is approximately 270 feet southwest of the Direct Study Area (Replacement ATCT) at its nearest point. Broad Run is a 38.0-mile-long tributary of the Occoquan River (U.S. Geological Survey, 2024).

FIGURE 3-9: USACE NATIONAL WETLANDS INVENTORY

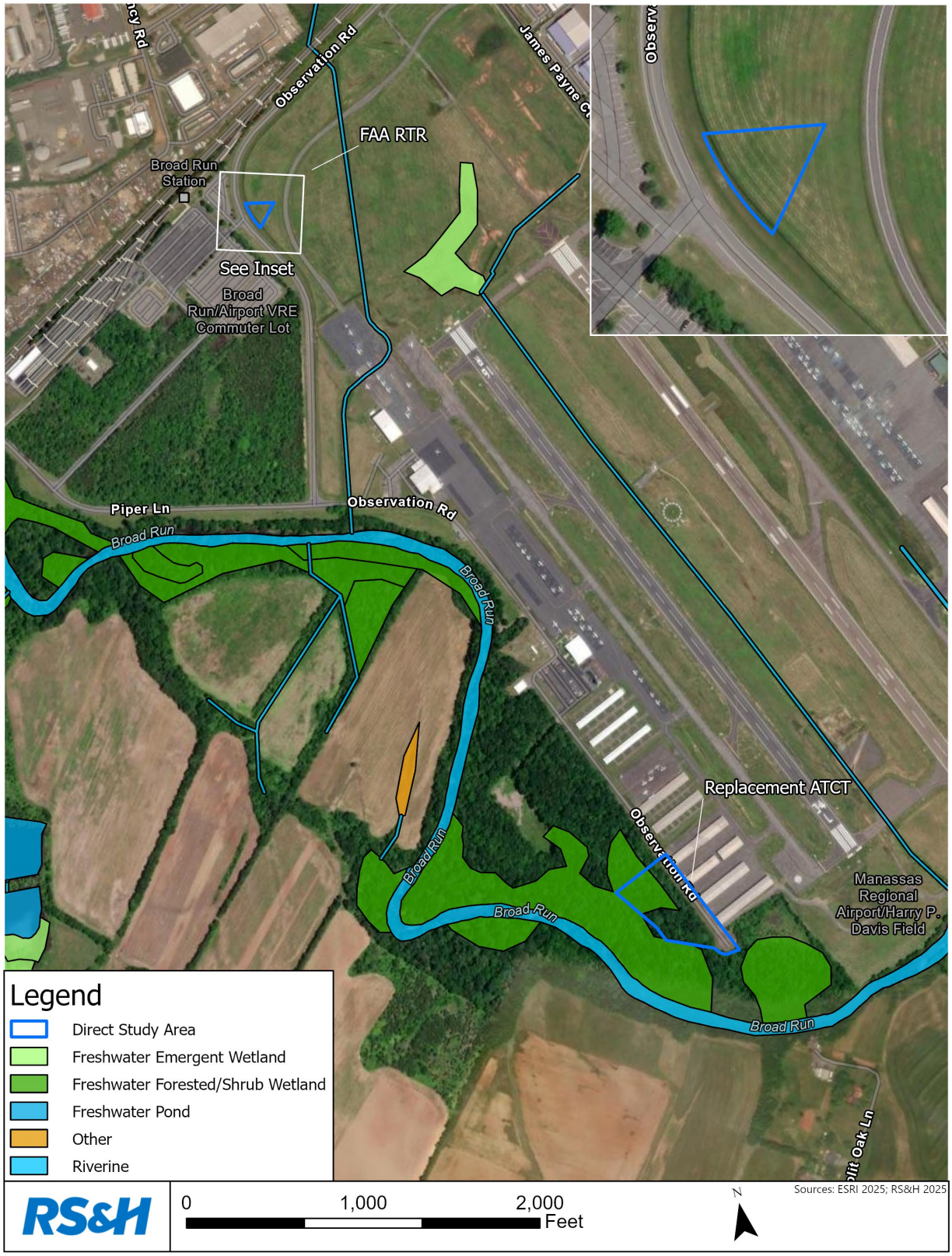
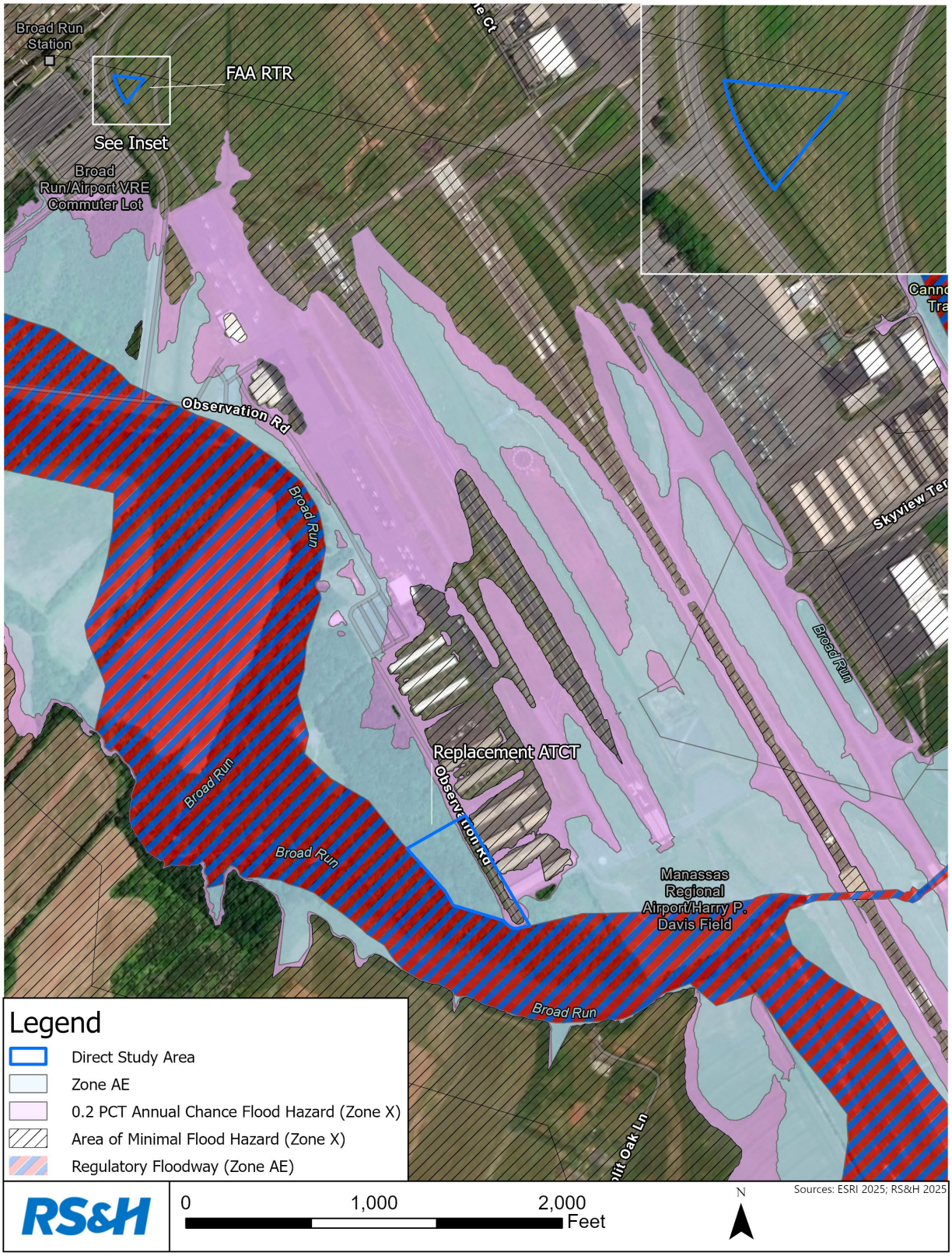


FIGURE 3-10: FLOODPLAINS



The City operates under a VDEPS General Permit (VAR050985) for stormwater discharge associated with industrial activity, effective June 1, 2024, to June 30, 2029. To comply with the VPDES General Permit, the City maintains an SPCC Plan and SWPPP for the Airport. These plans outline BMPs for controlling potential pollutant releases to the surrounding surface waters. These plans also provide detailed procedures to follow in the unlikely event of a spill to minimize potential effects on the surrounding environment.

Groundwater - The Direct Study Area is not located within a Sole Source Aquifer area; the nearest Sole Source Aquifer is the Poolesville Area Aquifer Extension of the Maryland Piedmont Aquifer, located over 24 miles north of the Direct Study Area (U.S. Environmental Protection Agency, 2024). Based on the nearest U.S. Geological Survey (USGS) groundwater monitoring wells, groundwater depth within the Direct Study Area ranges from 10 to 16 feet (U.S. Geological Survey, 2024).

3.2.13.2 Environmental Consequences

Significance Thresholds

Wetlands - FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for wetlands, which states, "The action would:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);
- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development of secondary activities or services that would cause the circumstances listed above to occur; or 6. Be inconsistent with applicable state wetland strategies.
- Be inconsistent with applicable state wetland strategies."

Floodplains – FAA Order 1050.1F, Exhibit 4-1 defines the FAA's significance threshold for floodplains, which states, "The action would cause notable adverse impacts on natural and beneficial floodplain values."[13]

[13] According to DOT Order 5650.2, Paragraph 4.k, "Natural and Beneficial Floodplain Values include but are not limited to: natural moderation of floods, water quality maintenance, groundwater recharge, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, and forestry."

Surface Water - FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for surface waters, which states, "The action would:

- Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies
- Contaminate public drinking water supply such that public health may be adversely affected."

Additional factors to consider include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained, and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

Groundwater - FAA Order 1050.1F, Exhibit 4-1, defines the FAA's significance threshold for groundwater, which states, "The action would:

- Exceed groundwater quality standards established by Federal, state, local, and tribal regulatory agencies or
- Contaminate an aquifer used for public water supply such that public health may be adversely affected."

Potential Impacts

Wetlands – A wetland survey performed in April 2024 did not identify any wetlands within the Direct Study Area (Replacement ATCT) where ground-disturbing activities would occur (see ***Appendix C***). The wetland survey information was transmitted to the USACE for review and comment on October 29, 2024. Multiple inquiries were made to acquire the USACE's input regarding the lack of wetlands in the Direct Study Area. As of February 2026, the USACE has not replied to the information submitted. There are no wetlands within the Direct Study Area (FAA RTR).

When compared to the No Action Alternative, the Proposed Action would not significantly affect wetlands.

Floodplains - Using the USACE HEC-RAS model, existing floodplain conditions were updated to reflect the construction of the Proposed Action to quantify the impact on the 100-year floodplain and BFE without mitigation measures. As shown in ***Table 3-13***, the model results show that the Proposed Action would result in 3,900 cubic yards of fill within 0.71 acre of the 100-year floodplain and a BFE increase of 0.04 feet.

The Proposed Action's floodplain compensation was evaluated within the Direct Study Area (Replacement ATCT) to determine if a no-rise condition could be achieved. To minimize the impacts on the floodplain, the area between the Proposed Action fill platform and the Direct Study Area (Replacement ATCT) boundary was graded at approximately 0.5% to promote drainage while maximizing cut volume to the extent practical. The analysis resulted in approximately 4,600 cubic yards of floodplain compensation, exceeding the 3,900 cubic yards of fill placed for the Proposed Action. Additionally, Cross Section 273.9 in the revised HEC-RAS model was updated with the compensation area elevations. The model results showed no increases in BFE and a maximum decrease of 0.02 feet from the No Action Alternative, which meets the requirements of a no-rise condition.

Figure 3-11 shows the approximate limits of the flood compensation area within the Direct Study Area (Replacement ATCT). See ***Appendix F*** for the *Floodplain Findings and Assessment Report*.

TABLE 3-13: FLOODPLAIN IMPACTS

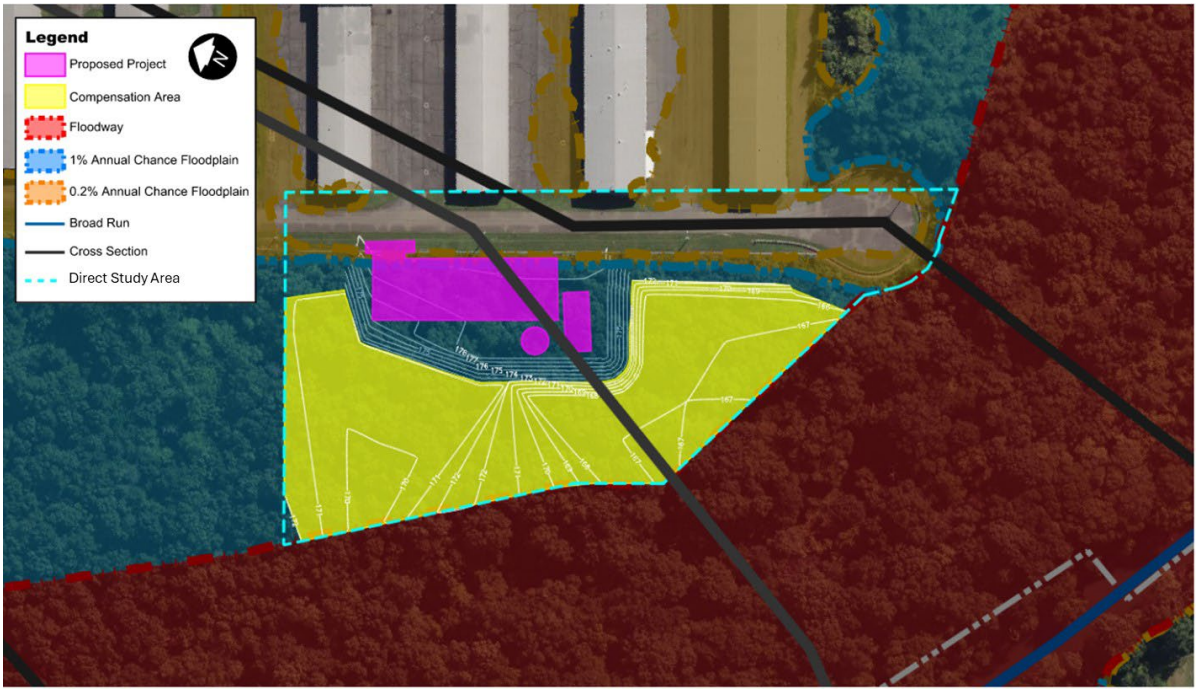
BFE (FT NAVD88	DFE (FT NAVD88)	Disturbed Floodplain Area (ac)	Fill Volume* (cy)	BFE Increase (ft)
175.61	178.61	0.71	3,900	0.04

Notes: BFE – Base Flood Elevation; DFE – Design Flood Elevation; ac – acres; cy – cubic yards; ft – feet. Source: RS&H, 2024.

Prior to construction, a Flood Hazard Use Permit would be obtained from Prince William County that would demonstrate no-net-rise to the floodplain. To comply with minimum floodplain standards required by the National Flood Insurance Program (NFIP) for new buildings in a Zone AE floodplain, new structures must be elevated to or above the base flood elevation (BFE). In addition, construction Best Management Practices (BMPs) would help reduce construction runoff and pollutant transport. Silt fences and inlet filters would help reduce sediment transport to the surrounding floodplains. To ensure the inlet filters perform as intended, any sediment accumulated during construction should be removed to ensure proper capacity. During construction, the selected contractor would comply with the Flood Hazard Use Permit, VPDES General Permit (VAR050985), the Airport's amended SWPPP, which would include the Proposed Action, and SPCC Plan to minimize or prevent impacts to the floodplain.

Through compliance with applicable permits and compensatory storage and conveyance, the natural and beneficial floodplain values would be maintained following the construction of the Proposed Action, resulting in no significant effect on floodplains when compared to the No Action Alternative. The Proposed Action's affect on the 100-year flood elevation would not result in a high probability of loss of life, substantial costs or damages (including the interruption of aircraft service or loss of a vital transportation facility), or cause adverse impacts on natural and beneficial floodplain values.

FIGURE 3-11: FLOODPLAIN COMPENSATION AREA



Source: RS&H, 2024.

Surface Water - The Direct Study Area does not contain any surface waters; the nearest surface water is Broad Run, over 300 from the proposed ATCT location. As described previously, prior to construction, the City would provide notice to VDEQ of the Proposed Action and amend the Airport's existing SWPPP to include the measures and controls employed to meet the no net increase of stormwater nutrient and sediment load resulting from the Proposed Action. During construction, the selected contractor would implement stormwater, erosion, and sediment control BMPs in compliance with the Airport's amended SWPPP to minimize or prevent pollutants from impacting Broad Creek. For example, the Airport maintains several oil/water separators connected to paved ditches that collect runoff and separate accumulated oils and sediments. According to FAA Advisory Circular 150/5370-10, *Standard Specifications for Construction of Airports*, examples to minimize erosion include silt fences, slope drains, seeding, and mulching. Erosion and sediment control BMPs implemented during tree-clearing for the geotechnical survey on March 24 and 29, 2025, included installing a silt fence and establishing a construction entrance to minimize soil loss and prevent sediment and pollutants from entering nearby surface waters.

Following construction, impervious surfaces would be less than 0.5 acre. The increase in the amount and rate of stormwater would be accommodated by BMPs to accomplish water quality and quantity goals due to the increase in impervious area.

Additionally, all disturbed areas would be seeded with a seed mix containing species appropriate for the region. Implementing the Proposed Action would not exceed the water

quality standards established by Federal, state, or local regulatory agencies, nor contaminate public drinking water supply such that public health would be adversely affected. Through compliance with the VPDES General Permit (VAR050985), amended SWPPP, and SPCC Plan, and stormwater management improvements, the Proposed Action, when compared to the No Action Alternative, would have no significant effect on surface waters.

Groundwater - As noted in ***Section 3.2.13.1***, the depth of groundwater is around 10 feet or more below the surface. It is unlikely that construction of the Proposed Action would encounter groundwater. In addition, the Proposed Action is not located within a Sole Source Aquifer area and does not involve any groundwater withdrawals, construction of new wells, or impacts to existing wells. During construction, the selected contractor would comply with the VPDES General Permit (VAR050985), amended SWPPP, and SPCC Plan to minimize and prevent pollutants from impacting water resources, including groundwater. Following construction, the Proposed Action would not change groundwater resources. When compared to the No Action Alternative, the Proposed Action would have no significant effect on groundwater through compliance with the VPDES General Permit (VAR050985), amended SWPPP, and SPCC Plan.

Implementing the Proposed Action would cause a less than significant environmental effect on Water Resources. When considering projects planned to occur in the reasonably foreseeable future, the Proposed Action would not cause significant environmental effects. Therefore, the Proposed Action's construction and operation, combined with the reasonably foreseeable future projects, would not have a significant environmental impact.

Mitigation Measures - Prior to construction, the City would provide notice to VDEQ of the Proposed Action and amend the Airport's existing SWPPP in compliance with the City's VDEPS General Permit (VAR050985). Specifically, the City would document in the SWPPP the methods used to determine the nutrient and sediment loadings and measures to meet the no net increase of stormwater nutrient and sediment load resulting from the Proposed Action. During construction, the selected contractor would implement stormwater, erosion, and sediment control BMPs in compliance with the amended SWPPP to minimize or prevent pollutants from entering Broad Run and nearby wetlands along Broad Run. Following construction, all disturbed upland areas would be seeded with a seed mix containing species appropriate for the region. The City would also obtain a Flood Hazard Use Permit from Prince William County prior to construction. The selected contractor would conduct all work in compliance with the Flood Hazard Use Permit, VPDES General Permit (VAR050985), amended SWPPP, and SPCC Plan.

During the VDEQ's review of the Draft EA, several recommendations were provided to the City. The following will be implemented as applicable:

> The City is responsible for submitting project-specific erosion and sediment control (ESC) plan to the locality in which the project is located for review and approval pursuant to the local ESC requirements, if the project involves a land- disturbing activity of greater than or

equal to 10,000 square feet (greater than or equal to 2,500 square feet in a Chesapeake Bay Preservation Area).

Non-point source pollution resulting from this project will be minimized by using effective erosion and sediment control practices and structures. Consideration will also be given to using permeable paving for parking areas and walkways where appropriate and denuded areas should be promptly revegetated following construction work. Impacts to surface waters are not expected, but per VDEQ recommendations, should there be impacts to surface waters a Virgina Water Permit will be obtained.

The City will implement and adhere to applicable state and local erosion and sediment control/stormwater management laws and regulations and maintain as much forested buffer between the proposed development and streams to protect water quality, per the Virginia Department of Conservation and Recreation (DCR) recommendations.

Additional mitigation measures are not required or proposed.

4
AGENCY AND PUBLIC INVOLVEMENT

The EA coordination process described in this chapter provides applicable agencies and the public the opportunity to comment on the potential effects of the construction and operation of the Proposed Action.

Per FAA Order 1050.1F, Section 2-5, Public Involvement, the FAA is to "…solicit appropriate information from the public…and provide the public with this information and allow it to comment on these findings." With the public release of the Draft EA, the City is providing the public and agencies the opportunity to provide input regarding the Proposed Action analyzed in this EA. The public and agency involvement process will:

- Provide information about the Proposed Action's purpose and need and the alternatives the EA discusses.
- Obtain feedback about the Proposed Action and its potential environmental impacts from the public and agencies interested in and affected by the Proposed Action.
- Inform those interested that the EA provides a full and fair discussion of project-related environmental effects.
- Provide timely public notices to the interested parties so that they may submit comments concerning the Proposed Action.
- Record comments received from interested parties and incorporate those comments into the document as appropriate.

4.1 PUBLIC INVOLVEMENT AND AGENCY COORDINATION APPROACH AND PROCESS

Pertinent federal statutes, regulations, executive orders, and guidance are considered when conducting the public involvement process. ***Table 4-1*** lists the agencies and Tribes that were emailed an initial coordination letter providing details on the components of the Proposed Action and provided the opportunity to comment (see ***Appendix G***). The agency comments received in response to the initial coordination letters are reflected in the applicable sections of ***Chapter 3*** (Affected Environment and Environmental Consequences).

Copies of the agency response letters are included in ***Appendix G***.

TABLE 4-1: EARLY AGENCY COORDINATION

Agency	Date Initiated	Response (Yes or No)
EPA	12/21/23	Yes
FEMA	12/21/23	No
U.S. Department of the Interior	12/21/23	No
U.S. Department of Agriculture	12/21/23	Yes
U.S. Army Corps of Engineers	12/21/23	No
National Oceanic and Atmospheric Administration	12/21/23	No
USFWS	12/21/23	No
VDEQ	12/21/23	Yes

Agency	Date Initiated	Response (Yes or No)
VDGIF	12/21/23	Yes
VDCR	12/21/23	No
State NFIP Coordinator/Lead Floodplain Program Planner	12/21/23	No
Virginia Department of Aviation	12/21/23	Yes
Virginia Department of Transportation	12/21/23	Yes
City of Manassas	12/21/23	Yes
Prince William County	12/21/23	Yes
FAA Coordination		
VDHR	1/30/24	Yes
Catawba Indian Nation	1/30/24	No
Chickahominy Indian Tribe	1/30/24	No
Delaware Nation, Oklahoma	1/30/24	No
Pamunkey Indian Tribe	1/30/24	No

Source: RS&H, 2024.

TABLE 4-2: DRAFT EA AVAILABLE LOCATIONS

Location Name	Address
Manassas Regional Airport Administrative Office (hardcopy)	10600 Harry J. Parish Blvd. Manassas, VA 20110
Manassas Regional Airport Website (electronic copy)	https://flyhef.com/about/plans-projects/plans-studies
Central Community Library (hardcopy)	8601 Mathis Ave. Manassas, VA 20110

Source: RS&H, 2024.

4.2 DISTRIBUTION OF THE DRAFT EA AND PUBLIC MEETING

The Draft EA notice of availability was published in the Prince William Times (see ***Appendix H***) on February 19, 2026. The Draft EA was made available for a 30-day review (February 19, 2026 – March 21, 2026) at the Airport's administrative office during normal business hours, on the Airport's website (https://flyhef.com/about/plans-projects/plans-studies), and at the Central Community Library.

The City held the Draft EA Public Meeting on March 10, 2026, from 5 pm to 7 pm at the Airport. The public meeting included exhibit boards, solicited public comments regarding the Proposed Project, and discussed the potential environmental impacts with the City's Airport staff and its consultant (RS&H, Inc.) (see ***Appendix H***). The public meeting was not attended by the general public, and no comments were received at the public meeting.

During the public review of the Draft EA, no comment letters were mailed or emailed to the City or its consultant. Federal, state, and local agencies were also provided the opportunity to review and comment on the Draft EA. Three agency comments were received from the Virginia

Department of Environmental Quality, the USDA, and the USEPA (see ***Appendix H***). Responses to comment letters are in ***Appendix H***.

4.3 FINAL EA

This Final EA and the FAA's decision are available at the Airport's administrative office, on the Airport's projects website, and at the Central Community Library.

5
LIST OF PREPARERS

This section lists the EA's principal preparers, including representatives from the City and RS&H and its EA team.

5.1 MANASSAS REGIONAL AIRPORT

Juan Rivera - Airport Director

Jolene Berry - Assistant Airport Director

5.2 RS&H, INC.

David Alberts

Position: Project Manager, Senior Environmental Planner
Education: B.S. Geography
Experience: Mr. Alberts has 28 years of NEPA-related experience. He is the RS&H Team Project Manager and is responsible for the Purpose and Need, Alternatives, technical NEPA documentation, and quality assurance of the NEPA analyses in the EA.

Dave Full, AICP

Position: Vice President, Aviation Environmental Planning Service Group
Education: M.A. Urban Planning; B.A. Urban Planning
Experience: Mr. Full has 36 years of experience. He is responsible for the quality assurance of the EA's NEPA analyses.

Dean McMath

Position: Senior Environmental Planner
Education: B.S. Biology
Experience: Mr. McMath has 39 years of NEPA-related experience, 35 of them working with the FAA as the Southwest Region Environmental Programs Manager. He is responsible for the independent quality assurance of the NEPA analyses in the EA.

Mike Alberts

Position: Senior Aviation Specialist
Education: B.S. Geography
Experience: Mr. Alberts has 28 years of aviation noise modeling/mitigation experience. He is responsible for the technical noise analysis in the EA.

Katherine Martin

Position: Environmental Consultant
Education: M.S. Environmental Science; B.S. Natural Resource Conservation
Experience: Ms. Martin has nearly 10 years of environmental consulting experience. She is an environmental scientist at RS&H and is responsible for wetland and wildlife assessments in the EA.

Monica H. Frederick

Position: Aviation Environmental Specialist
Education: B.S. Interdisciplinary Studies-Environmental Science
Experience: Ms. Hamblin has 7 years of experience in the environmental field. She is responsible for assisting with data collection, technical writing, and exhibit production.

Tamsen Binggeli, AICP

Position: Aviation Environmental Specialist
Education: M.S. Environmental Science; B.B.A. International Business
Experience: Ms. Binggeli has 18 years of experience in environmental planning, permitting, and NEPA compliance. She is responsible for assisting with data collection, technical writing, and exhibit production.

Steven Wilson, PE

Position: Water Resources Engineer
Education: M.E. Environmental Engineering Sciences; B.S. Civil Engineering
Experience: Mr. Wilson has 10 years of engineering experience with 8 years dedicated to the aviation industry. He is responsible for helping prepare the Water Resources documentation, specifically the Floodplains and Surface Waters analyses in the EA.

Michael Fesanco, C.M.

Position: Aviation Environmental Specialist
Education: M.S. Aviation Management; B.S. Aviation Management
Experience: Mr. Fesanco has 3 year of experience in the environmental field. He is responsible for assisting with data collection, technical writing, and exhibit production.

Joel Azopardi

Position: Visualization Project Lead, Visualization Production Manager
Education: B.A. (Hons) Technical Illustration
Experience: Mr. Azopardi has 18 years of 3D Visualization experience in Architectural Visualization and the AEC industry. He is responsible for the visualization methodology, photography, and quality assurance of the visual effects photo simulations in the EA.

Chris Gallop

Position: Associate Director, Creative Services
Education: A.A. 3D Art
Experience: Mr. Gallop has 25 years of experience in Visualization, Animation, and Production Management. He Manages two dynamic departments: the Visualization Team, which specializes in creating convincing and comprehensive photorealistic renders, animations, & interactive experiences, and the Graphic Design Team, which produces stunning graphics for pre-marketing, pursuits, presentations, conferences, and events. Responsibilities include overseeing production, ensuring deliverable deadlines are met, coordinating with other departments and external firms, delegating assignments, supervising staff, conducting employee evaluations, interviewing, and training.

Jason Frank

Position: Creative Services Specialist
Education: B.F.A. Animation
Experience: Mr. Frank has over 5 years of experience in 3D and visualization. He is a member of the Visualization team. He is responsible for executing the camera matching, 3D rendering, and post-production of the visual effects photo simulations in the EA.

5.3 THE MANNIK & SMITH GROUP, INC.

Robert Chidester, RPA 1066050

Position: Cultural Resources Service Director / Senior Project Manager
Education: Ph.D., Anthropology and History
Experience: Dr. Chidester has over 15 years of experience in NEPA and Section 106 (National Historic Preservation Act) compliance. He is the Cultural Resources Lead and is responsible for the Cultural Resources portion of the NEPA analyses in the EA.

6
REFERENCES

References

14 CFR Part 150. (n.d.). *Airport Noise Compatibility Planning*. Retrieved from Code of Federal Regulations: https://www.ecfr.gov/current/title-14/chapter-I/subchapter-I/part-150

16 U.S.C. § 1431 et seq. (n.d.). *Marine Sancturaries*. Retrieved from Office of the Law Revision Council United States Code: https://uscode.house.gov/view.xhtml?path=/prelim@title16/chapter32&edition=prelim

16 U.S.C. § 1451-1466. (2023). *Coastal Zone Management*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2023-title16/pdf/USCODE-2023-title16-chap33-sec1451.pdf

16 U.S.C. § 1531 et seq. (n.d.). *Endagered Species*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2018-title16/html/USCODE-2018-title16-chap35-sec1531.htm

16 U.S.C. § 668-668d. (n.d.). *Protection of Bald and Golden Eagles*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2010-title16/pdf/USCODE-2010-title16-chap5A-subchapII.pdf

16 U.S.C. § 703 et seq. (n.d.). *Migratory Bird Treaty*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2022-title16/pdf/USCODE-2022-title16-chap7-subchapII-sec703.pdf

16 U.S.C. Section 3501 et seq. (2012, January 3). *Coastal Barrier Resources*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/app/details/USCODE-2011-title16/USCODE-2011-title16-chap55-sec3501

33 U.S.C. § 1251 et seq. (1972). *Water Pollution Prevention Act.* Retrieved from U.S. Goverment Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2018-title33/pdf/USCODE-2018-title33-chap26.pdf

36 CFR Part 800 et seq. (n.d.). *Protection of Historic Properties*. Retrieved from https://www.achp.gov/sites/default/files/regulations/2017-02/regs-rev04.pdf

42 U.S.C. § 300 et seq. (1974). *Title 42: The Public Health and Welfare.* Retrieved May 2024, from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2010-title42/pdf/USCODE-2010-title42-chap6A-subchapXII.pdf

42 U.S.C. § 4001 et seq. (1997, August). *The National Flood Insurance Act of 1967, as Amended.* Retrieved from Federal Emergency Management Agency: https://www.fema.gov/sites/default/files/2020-07/national-flood-insurance-act-1968.pdf

42 U.S.C. § 4601 et seq. (n.d.). *Uniform Relocation Assistance and Real Property Acquisitions Policies for Federal and Federally Assisted Programs*. Retrieved from https://www.law.cornell.edu/uscode/text/42/chapter-61

42 U.S.C. § 7401 et seq. (n.d.). *Air Pollution and Prevention Control*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2010-title42/html/USCODE-2010-title42-chap85.htm

42 U.S.C. § 9601 et seq. (1980, December 11). *Comprehensive Environmental Response, Compensation and Liability Act*. Retrieved from https://www.govinfo.gov/content/pkg/USCODE-2011-title42/html/USCODE-2011-title42-chap103.htm

43 CFR Part 774. (2024). *Title 43 Code of Federal Regulations Part 774 - Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites.* Retrieved from https://www.ecfr.gov/current/title-23/chapter-I/subchapter-H/part-774?toc=1

43 U.S.C. § 6903 et seq. (1976). *Resource Conservation and Recovery Act. EPA Summar*. Retrieved from https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act

54 U.SC. § 300101 et seq. (n.d.). *National Preservation Programs, Historic Preservation*. Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/content/pkg/USCODE-2022-title54/pdf/USCODE-2022-title54-subtitleIII-divsnA-app-chap3001-sec300101.pdf

Advisory Council on Historic Preservation. (2021). *A Citizen's Guide to Section 106 Review.* Retrieved from https://www.achp.gov/sites/default/files/documents/2021-01/CitizenGuide2021_011321.pdf

City of Manassas. (2023, October 12). *Article VIII Zoning Districts.* Retrieved from Zoning Ordinance: https://cms9files.revize.com/manassasva/Community%20Development/zoning%20ordinance/12-23%20ARTICLE%208%20-%20ZONING%20DISTRICTS.pdf

City of Manassas. (2024, May 22). *History*. Retrieved from City of Manassas: https://www.manassasva.gov/airport/airport_history.php

City of Manassas. (2024). *Manassas Zoning and Parcel Map*. Retrieved from Manassas Zoning Ordinance: https://cityofmanassas.maps.arcgis.com/apps/webappviewer/index.html?id=5435b6acfd274042a95914ad9ae97660

City of Manassas. (2024, July 12). *Noise Program*. Retrieved from City of Manassas: https://www.manassasva.gov/airport/noise_program.php

City of Manassas. (2024). *Parks and Trails*. Retrieved from Manassas Parks and Recreation Department: https://www.manassasva.gov/parks_culture_and_recreation/parks.php

Code of Virginia. (2024). *Code of Virginia Section 28.2-100*. Retrieved from https://law.lis.virginia.gov/vacode/title28.2/chapter1/section28.2-100/

Elizabeth Anderson Comer Archaeology. (2017). *Phase I Archaeological Study for the Proposed West Corporate Development and East Parcel Development.* Manassas.

Engineering & Materials Technologies, Inc. (2025). *Subsurface Exploration Report for New Air Traffic Control Tower Monassas Regional Airport (HEF).* Monassas, Virginia.

EPA. (2024, October 10). *Clean Air Act Section 184*. Retrieved from EPA: https://www.epa.gov/Cross-State-Air-Pollution/what-does-clean-air-act-say-about-cross-state-air-pollution

EPA. (2024, October 10). *Greenhouse Gas Inventory Data Explorer*. Retrieved from EPA: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/all

EPA. (2024, December 16). *NAAQS Table*. Retrieved from EPA: https://www.epa.gov/criteria-air-pollutants/naaqs-table#1

Executive Order 11988: Floodplain Management. (1977, May 24). Retrieved from Department of Transportation: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/eo11988.pdf

Executive Order 11990 – Protection of Wetlands. (1977, May 24). Retrieved from https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/Req-EO11990wetlands.pdf

Executive Order 13089 - Coral Reef Protection. (1998, June 11). Retrieved from https://www.govinfo.gov/content/pkg/WCPD-1998-06-15/pdf/WCPD-1998-06-15-Pg1099.pdf

Executive Order 13547 - Stewardship of the Ocean, Our Coasts, and the Great Lakes. (2010, July 19). Retrieved from U.S. Government Publishing Office: https://www.govinfo.gov/app/details/DCPD-201000608

FAA National Plan of Integrated Airport Systems. (2024). Retrieved from FAA NPIAS 2025-2029: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/npias/current/ARP-NPIAS-2025-2029-Appendix-A.pdf

Federal Aviation Administration. (1976, November 18). *Aviation Noise Abatement Policy.* Retrieved from FAA Regulations and Policies:

https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/envir_policy/FAA1976NoisePolicy.pdf

Federal Aviation Administration. (2015, July 16). Retrieved from FAA Order 1050.1F, Environmental Impacts: Policies and Procedures: https://www.faa.gov/documentlibrary/media/order/faa_order_1050_1f.pdf

Federal Aviation Administration. (2023, October). *1050.1F Desk Reference, Version 3. .* Retrieved from https://www.faa.gov/media/71921

Federal Aviation Administration. (2024). *Airport Data and Informational Portal*. Retrieved from https://adip.faa.gov/agis/public/#/public

Federal Emergency Management Agency. (2024). *Flood Insurance Rate Map (FIRM) Mapper*. Retrieved from https://msc.fema.gov/portal/search?AddressQuery=HEF%20Airport

FHWA. (2024, August 24). *Construction Noise Handbook*. Retrieved from FHWA: https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm

FRED Economic Data. (2024, May 1). *Unemployment Rate in Prince William County, VA*. Retrieved from FRED: https://fred.stlouisfed.org/series/VAPRIN3URN

JR Real Estate Group. (2024, February 8). *Unanimous Approval: Prince William County Planning Commission Approves Bristow Crossing and Bristow Corner Rezoning Projects*. Retrieved from JR Real Estate Group: https://jrrealestatellc.com/unanimous-approval-prince-william-county-planning-commission-approves-bristow-crossing-and-bristow-corner-rezoning-projects/

National Oceanic and Atmospheric Administration. (2025). *Climatological Data for Washington Area, DC - March 2025*. Retrieved from National Weather Service: https://www.weather.gov/wrh/Climate?wfo=lwx

Northern Virginia Electric Cooperative. (2024, June 5). *Office Locations/Service Territory*. Retrieved from Northern Virginia Electric Cooperative: https://www.novec.com/About_NOVEC/index.cfm

Prince William County. (2024). *Building in Environmentally Sensitive Areas*. Retrieved from Environmental Management: https://www.pwcva.gov/department/environmental-services/building-environmentally-sensitive-areas

Prince William County. (2024). *Flood Hazard Use Permit Application.* Retrieved from https://www.pwcva.gov/assets/2023-02/Flood%20Hazard%20Use%20Permit%20App%20FY23.pdf

Prince William County. (2024, June 4). *Prince William County Sanitary Landfill*. Retrieved from Prince William County: https://www.pwcva.gov/department/solid-waste-management/locations-hours

Prince William County. (2024). *Prince William County Sanitary Landfill.* Retrieved from Department of Public Works: https://www.pwcva.gov/department/solid-waste-management/landfill

Prince William County. (2024). *Prince William County Sanitary Landfill Alternative Disposal Locations.* Retrieved from Department of Public Works: https://www.pwcva.gov/assets/2024-07/Alternative%20Disposal%20Form%20w.%20HHW%20Options%20-%20Copy.pdf

Prince William County. (2024). *Resource Protection Areas*. Retrieved February 2017, from Environmental Management: https://www.pwcva.gov/department/environmental-services/resource-protection-areas#:~:text=RPA%20areas%20are%20protected%20under,perennial%20streams%20in%20the%20County

Prince William County. (2024). *Resource Protection Areas (RPA)*. Retrieved from GIS Data Portal: https://gisdata-pwcgov.opendata.arcgis.com/datasets/PWCGOV::resource-protection-areas-rpa/about

Prince William County Department of Public Works. (2022, February). *Prince William County Solid Waste Management Plan Update*. Retrieved from Prince William County: https://www.pwcva.gov/assets/2022-02/SWMP%20Presentation%20Web%20Feb22%20-website.pdf

Prince William County Parks & Recreation. (2024). *Prince William Recreation Mapper*. Retrieved from https://pwcgov.maps.arcgis.com/apps/Shortlist/index.html?appid=7d835aaf7d4c419bb93358856c43677c

Prince William County Service Authority . (2024, June 5). *About Us*. Retrieved from Prince William County Service Authority : https://www.pwcsa.org/who-we-are/about-us

Prince William County Service Authority. (2024, June 5). *Water Quality and Supply FAQ*. Retrieved from Prince William County Service Authority: https://www.pwcsa.org/water-quality-faq

Trust for Public Land. (2024). *The Land and Water Conservation Fund – Past Projects*. Retrieved from https://lwcf.tplgis.org/mappast/

U.S. Army Corps of Engineers. (1987, January). *Corps of Engineers Wetland Delineation Manual.* Retrieved from

https://www.nae.usace.army.mil/Portals/74/docs/regulatory/JurisdictionalLimits/wlman87.pdf

U.S. Army Corps of Engineers. (2012, April). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0).* Retrieved from https://www.nap.usace.army.mil/Portals/39/docs/regulatory/reg_supplements/EMP_Piedmont_v2.pdf

U.S. Census Bureau. (2020). *Census Tract 9104.02, Manassas city, Virginia*. Retrieved from https://data.delawareonline.com/census/total-population/diversity-index/census-tract-910402-manassas-city-virginia/140-51683910402/

U.S. Census Bureau. (2020, April 1). *Prince William County, Virginia*. Retrieved from United States Census Bureau: https://www.census.gov/quickfacts/fact/table/princewilliamcountyvirginia/PST040223

U.S. Census Bureau. (2020). *TIGERweb Decennial Map*. Retrieved from Topologically Integrated Geographic Encoding and Referencing Database: https://tigerweb.geo.census.gov/tigerweb2020/

U.S. Census Bureau. (2022). *American Community Survey*. Retrieved from https://censusreporter.org/profiles/14000US51683910402-census-tract-910402-manassas-va/

U.S. Census Bureau. (2024, May 22). *Unemployment Rate - Manassas City, VA (March 2024)*. Retrieved from American Community Survey: https://data.usatoday.com/unemployment/manassas-city-va/CN5168300000000/

U.S. Census Bureau. (2024, May 21). *Virginia*. Retrieved from United States Census Bureau: https://data.census.gov/profile/Virginia?g=040XX00US51

U.S. Census Bureau. (2024, May 21). *Which States Have the Highest Percentage of Vacant Housing Units*. Retrieved from United States Census Bureau: https://www.census.gov/content/dam/Census/library/publications/2022/demo/h121-22-01.pdf

U.S. Department of Interior. (2024). *Nationwide Rivers Inventory.* Retrieved May 2023, from National Park Service: https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977

U.S. Department of Interior. (2024). *Wild and Scenic Rivers.* Retrieved May 2023, from National Parks Service: https://nps.maps.arcgis.com/apps/View/index.html?appid=ff42a57d0aae43c49a88daee0e353142

U.S. Department of Transportation. (1979, April 23). *U.S. DOT Order 5650.2.* Retrieved from Department of Transportation: https://www.fhwa.dot.gov/engineering/hydraulics/policymemo/order56502.pdf

U.S. Environmental Protection Agency. (2018, September). *Overview of Greenhouse Gases*. Retrieved from https://www.epa.gov/ghgemissions/overview-greenhouse-gases

U.S. Environmental Protection Agency. (2023, September 15). *Air Quality Implementation Plans*. Retrieved from Nonattainment and Ozone Transport Region (OTR) SIP Requirements: https://www.epa.gov/air-quality-implementation-plans/nonattainment-and-ozone-transport-region-otr-sip-requirements

U.S. Environmental Protection Agency. (2023). *Criteria Air Pollutants*. Retrieved February 2017, from https://www.epa.gov/criteria-air-pollutants

U.S. Environmental Protection Agency. (2024). *Clean Water Act Section 401: State Certification of Water Quality*. Retrieved from https://www.epa.gov/cwa-404/clean-water-act-section-401-certification

U.S. Environmental Protection Agency. (2024). *EPA Facilities*. Retrieved from NEPAssist Tool: https://nepassisttool.epa.gov/nepassist/nepamap.aspx

U.S. Environmental Protection Agency. (2024, June 4). *Fairfax Mercury*. Retrieved from Envirofacts: https://enviro.epa.gov/envirofacts/sems/detail-view?id=VAN000305614

U.S. Environmental Protection Agency. (2024). *Greenhouse Gas Inventory Data Explorer*. Retrieved from Inventory of U.S. Greenhouse Gas Emissions and Sinks: https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/all

U.S. Environmental Protection Agency. (2024, July 10). *Map of Sole Source Aquifer Locations*. Retrieved from https://www.epa.gov/dwssa/map-sole-source-aquifer-locations

U.S. Environmental Protection Agency. (2024). *NEPAssist Mapper*. Retrieved from https://nepassisttool.epa.gov/nepassist/nepamap.aspx?wherestr=HEF+Airport

U.S. Environmental Protection Agency. (2024, June 30). *Nonattainment Areas for Criteria Pollutants (Green Book)*. Retrieved from Virginia Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants: https://www3.epa.gov/airquality/greenbook/anayo_va.html

U.S. Environmental Protection Agency. (2024). *Overview of Clean Water Act Section 404*. Retrieved from https://www.epa.gov/cwa-404/clean-water-act-section-404

U.S. Fish and Wildlife Service. (2024). *Bald Eagle (Haliaeetus leucocephalus)*. Retrieved from Environmental Conservation Online System: https://ecos.fws.gov/ecp/species/1626

U.S. Fish and Wildlife Service. (2024, March 3). *Birds of Concern List.* Retrieved from https://www.fws.gov/sites/default/files/documents/2024-03/usfwsbirdspeciesofconcern_1.pdf

U.S. Fish and Wildlife Service. (2024). *Coastal Barrier Resource System Mapper*. Retrieved from https://fwsprimary.wim.usgs.gov/CBRSMapper-v2/

U.S. Fish and Wildlife Service. (2024). *Dwarf wedgemussel (Alasmidonta heterodon)*. Retrieved from Environmental Conservation Online System: https://ecos.fws.gov/ecp/species/784

U.S. Fish and Wildlife Service. (2024). *Endangered Species Act, Section 7, Interagency Cooperation*. Retrieved from USFWS Laws and Regulations: https://www.fws.gov/laws/endangered-species-act/section-7

U.S. Fish and Wildlife Service. (2024). *Endangered Species Act, Section 9, Prohibited Acts*. Retrieved from USFWS Laws and Regulations: https://www.fws.gov/laws/endangered-species-act/section-9

U.S. Fish and Wildlife Service. (2024, May 9). *Information for Planning and Conservation (IPaC).* Retrieved from https://ecos.fws.gov/ipac/

U.S. Fish and Wildlife Service. (2024). *Monarch butterfly (Danaus plexippus)*. Retrieved from Environmental Conservation Online System: https://ecos.fws.gov/ecp/species/9743

U.S. Fish and Wildlife Service. (2024). *National Wetlands Inventory Mapper*. Retrieved from https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/

U.S. Fish and Wildlife Service. (2024). *National Wildlife Refuges and National Fish Hatcheries: Virginia*. Retrieved from https://www.fws.gov/our-facilities?state_name=%5B%22Virginia%22%5D

U.S. Geological Survey. (2024). *National Map: National Hydrography Dataset.* Retrieved from https://www.usgs.gov/national-hydrography/national-hydrography-dataset

U.S. Geological Survey. (2024). *National Water Dashboard.* Retrieved from https://dashboard.waterdata.usgs.gov/app/nwd/en/

USDA NRCS. (2024, October 15). *Web Soil Survey*. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

VDOT. (2024). *Bidirectional Volume Data*. Retrieved from https://www.virginiaroads.org/datasets/VDOT::vdot-bidirectional-traffic-volume/explore?location=38.732660%2C-77.509577%2C15.63

Virginia Department of Aviation. (2018). *Virginia Airport System Economic Impact Study*. Retrieved from Virginia Department of Aviation- Airport System Economic Impact Study: https://www.loc.gov/item/2019452316/

Virginia Department of Environmental Quality. (2021). *Virginia Coastal Zone Management Program Enforceable Policies*. Retrieved from https://www.deq.virginia.gov/home/showpublisheddocument/8605/638186363140970000

Virginia Department of Environmental Quality. (2024). *Coastal Zone Management Boundaries in Virginia*. Retrieved from https://www.deq.virginia.gov/our-programs/coastal-zone-management/about-czm/czm-boundaries

Virginia Department of Environmental Quality. (2024). *VDEW Coastal Zone*. Retrieved from https://www.deq.virginia.gov/our-programs/coastal-zone-management/about-czm/czm-boundaries#!/

Virginia Department of Wildlife Resources. (2015, September 1). *2015 Wildlife Action Plan.* Retrieved from https://dwr.virginia.gov/wp-content/uploads/media/Wildlife-Action-Plan-2015-Virginia-Wildlife-Action-Plan.pdf

Virginia Department of Wildlife Resources. (2023, March 31). *Special Status Faunal Species in Virginia.* Retrieved from https://dwr.virginia.gov/wp-content/uploads/media/virginia-threatened-endangered-species.pdf

Virginia Department of Wildlife Resources. (2024). *Tri-colored bat*. Retrieved from Wildlife and Habitat: https://dwr.virginia.gov/wildlife/information/tri-colored-bat/

Virginia Railway Express. (2024, August 5). *Broad Run Expansion* . Retrieved from Virginia Railway Express: https://projects.vre.org/project?Project=Broad%20Run%20Expansion