

**DRAFT**  
**ENVIRONMENTAL ASSESSMENT**  
**for**  
**Home Basing of the MQ-25A Stingray Carrier-Based**  
**Unmanned Aircraft System**  
**at**  
**Naval Station Norfolk, Virginia**

**April 2025**



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## **Abstract**

**Designation:** Environmental Assessment

**Title of Proposed Action:** Home Basing of the MQ-25A Stingray Carrier-Based Unmanned Aircraft System

**Project Location:** Naval Station Norfolk, Virginia

**Lead Agency for the EA:** Department of the Navy

**Cooperating Agency:** None

**Affected Region:** Hampton Roads Metropolitan Area, Virginia

**Action Proponent:** United States Fleet Forces Command, Department of the Navy

**Point of Contact:** Naval Facilities Engineering Systems Command Atlantic  
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Norfolk, Virginia 23508

**Date:** April 2025

United States Fleet Forces Command, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality regulations and Navy regulations. The Proposed Action would home base and operate a new MQ-25A Stingray Carrier-Based Unmanned Aircraft System (CBUAS) squadron at Naval Station (NAVSTA) Norfolk, Virginia. Under the Proposed Action, the Navy would home base up to 20 Stingray CBUASs; renovate an existing hangar; construct supporting infrastructure; perform air vehicle maintenance; provide training for air vehicle pilots and maintainers; conduct approximately 960 Stingray CBUAS annual flight operations; conduct up to 2,880 chase aircraft annual flight operations, and station approximately 600 personnel, plus their family members at Naval Station Norfolk, Virginia. The Proposed Action would involve facility construction and renovation between approximately fiscal year (FY) 2026 and FY 2029, followed by a phased occupancy of the facilities by aircraft and personnel between FY 2031 and FY 2035. The Navy would obtain a Certificate of Authorization from the Federal Aviation Administration for the proposed Stingray CBUAS flights within the National Airspace System. This Environmental Assessment evaluates the potential direct, indirect, and cumulative environmental effects associated with the Proposed Action and the No Action Alternative to the following resource areas: public health and safety, noise, transportation, air quality, water resources, biological resources, and cultural resources.

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## EXECUTIVE SUMMARY

### ES.1 Proposed Action

United States Fleet Forces Command, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy) proposes to home base and operate a new MQ-25A Stingray Carrier-Based Unmanned Aircraft System (CBUAS) squadron at Naval Station (NAVSTA) Norfolk, Virginia. Under the Proposed Action, the Navy would home base up to 20 Stingray CBUAS; renovate an existing hangar; construct supporting infrastructure; perform air vehicle (AV) maintenance; provide training for air vehicle pilots (AVPs) and maintainers; conduct approximately 960 Stingray CBUAS annual flight operations; conduct up to 2,880 chase aircraft annual flight operations, and station approximately 600 personnel, plus their family members at NAVSTA Norfolk, Virginia. The Proposed Action would involve facility construction and renovation between approximately fiscal year (FY) 2026 and FY 2029, followed by a phased occupancy of the facilities by aircraft and personnel between FY 2031 and FY 2035. The Navy would obtain a Certificate of Authorization from the Federal Aviation Administration for the proposed Stingray CBUAS flights within the National Airspace System. The Navy would install a Ground-Based Detect and Avoid (GBDAA) system and Lightweight Surveillance and Target Acquisition Radar (LSTAR) tower to provide “detect and avoid” safety functionality for the Stingray CBUAS. Chase aircraft may be used when the GBDAA/LSTAR is unavailable to provide detect and avoid awareness.

### ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to base a new East Coast squadron designed to enhance aircraft carrier capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based, multi-mission aerial refueling and intelligence, surveillance, and reconnaissance unmanned aircraft system into the carrier air wing.

The need for the Proposed Action is to further the Navy’s execution of its congressionally mandated roles and responsibilities under 10 United States Code section 8062.

### ES.3 Alternatives Considered

Alternatives were developed for analysis based on reasonable screening factors. One action alternative, the Proposed Action, was identified as meeting the purpose of and need for the project and carried forward for analysis along with a No Action Alternative.

#### No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The No Action Alternative is used to analyze the consequences of not undertaking the Proposed Action and serves to establish a comparative baseline for analysis of the environmental effects associated with the Proposed Action.

#### Proposed Action

The Navy proposes to home base and operate a new Stingray CBUAS squadron at NAVSTA Norfolk, Virginia. Under the Proposed Action, the Navy would home base up to 20 Stingray CBUAS; renovate an existing hangar; construct supporting infrastructure; perform AV maintenance; provide training for AVPs and maintainers; conduct approximately 960 Stingray CBUAS annual flight operations; conduct up to 2,880 chase aircraft annual flight operations, and station approximately 600 personnel, plus their family members, at NAVSTA Norfolk, Virginia. Chase aircraft would only be used when the GBDAA/LSTAR is not available (e.g., for maintenance, system checks, updates, etc.). The E-2D, which is based at NAVSTA

Norfolk, would be the primary chase aircraft; however, C-12, C-38, T-45, and F/A-18 aircraft may be used as chase aircraft in rare instances. The Proposed Action would involve facility construction and renovation between approximately FY 2026 and FY 2029, followed by a phased occupancy of the facilities by aircraft and personnel between FY 2031 and FY 2035. The Navy would obtain a Certificate of Authorization from the Federal Aviation Administration for the proposed Stingray CBUAS flights within the National Airspace System.

#### **ES.4 Summary of Environmental Resources Evaluated in the Environmental Assessment**

The following resources have been analyzed in detail for potential direct, indirect, and cumulative effects resulting from the Proposed Action in this Environmental Assessment (EA): public health and safety, noise, transportation, air quality, water resources, biological resources, and cultural resources. Because potential effects were considered to be negligible or nonexistent, the following resources were not evaluated in detail in this EA: land use, geological resources, visual resources, hazardous materials and wastes, surface waters, emergency services, airspace designations, infrastructure, and socioeconomics.

#### **ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions**

Table ES-1 provides a summary of the potential effects to the resources associated with each of the alternative actions analyzed. No major mitigating actions are required for the Proposed Action.

#### **ES.6 Public Involvement**

The Navy has prepared this Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. Through the public involvement process, the Navy coordinates with relevant federal, state, and local agencies and notifies them and the public of the Proposed Action. Input from the public and from regulatory agencies is incorporated into the analysis of potential impacts, as appropriate.

A Notice of Availability of the Draft EA including information about where the Draft EA may be reviewed, the announcement of a 30-day public comment period, and dates and locations of two public open-house meetings was published in *The Virginian-Pilot*. The Draft EA is available on the Navy's website, <https://www.nepa.navy.mil/MQ25-East> and at local libraries (Mary D. Pretlow Anchor Branch Library and Tidewater Community College and City of Virginia Beach Joint-Use Library).

The public is invited to submit comments on the Draft EA by any of the following methods:

- by completing a comment form at one of the public meetings
- electronically, via the project website <https://www.nepa.navy.mil/MQ25-East>
- in writing, by mail to: MQ-25A Project Manager, Naval Facilities Engineering Systems Command Atlantic, Attn: Code EV21DS, 6506 Hampton Blvd, Norfolk, Virginia 23508

The Navy has initiated consultation with the United States Fish and Wildlife Service, Virginia Department of Historic Resources, and the Virginia Department of Environmental Quality. A Coastal Consistency Determination was prepared in accordance with the Coastal Zone Management Act and submitted to the Virginia Department of Environmental Quality. Correspondence with agencies will be included in the Final EA.

**Table ES-1 Summary of Potential Effects to Resource Areas**

<b>Resource Area</b>	<b>No Action Alternative</b>	<b>Proposed Action</b>
Public Health and Safety	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to public health and safety.	No significant effects to public health and safety would occur under the Proposed Action. There would be an increase in mishap risk at the airfield proportionate to the increase in operations (2% for the Stingray CBUAS and 6% total increase overall when including chase aircraft); however, the risk would remain very low overall. The Proposed Action would not result in environmental health and safety risks that may disproportionately affect children. Stingray CBUAS would utilize existing flight paths over the cities of Norfolk and Virginia Beach to access offshore Special Use Airspace training areas.
Noise	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to noise.	No significant effects to noise would occur under the Proposed Action. Noise-sensitive points of interest and DNL noise contours at NAVSTA Norfolk would not be expected to experience a perceptible change from existing conditions due to Stingray CBUAS and chase aircraft operations.
Transportation	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to transportation.	No significant effects to transportation would occur under the Proposed Action. An estimated 720 additional average daily vehicle trips on access roads are anticipated, resulting in a 5% increase on Bay Avenue (between I-64 and 1st View Street) and a 0.4% increase on I-564 (between Terminal Boulevard and Admiral Taussig Boulevard).
Air Quality	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to air quality.	No significant effects to air quality would occur under the Proposed Action. Because air emissions would be minimal or <i>de minimis</i> ; the Proposed Action is exempt from General Conformity requirements. Due to the intermittent nature of Proposed Action emission sources (construction and aircraft operations) and their relatively low quantities (compared to other sources), emissions would not result in an exceedance of a National Ambient Air Quality Standard. A Record of Non-Applicability is provided in Appendix A, <i>Air Quality Methodology and Calculations</i> .
Water Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to water resources.	No significant effects to water resources would occur under the Proposed Action. The Proposed Action would not affect the quality of groundwater resources at the project site. A small area of wetland adjacent to the GBDAA/LSTAR tower site would be affected temporarily during installation of underground utilities. Permits would be obtained prior to construction and permit conditions would be followed. Repairs to Taxiway Alpha would occur near wetlands; however, the repairs would be managed to avoid direct and indirect effects from runoff and sedimentation. Minor construction associated with installation of underground utilities connecting to the GBDAA/LSTAR tower would occur within a small portion of the 100-year floodplain; however, construction would not cause any upstream or downstream flooding and would not affect off-installation areas.

**Table ES-1 Summary of Potential Effects to Resource Areas**

<b>Resource Area</b>	<b>No Action Alternative</b>	<b>Proposed Action</b>
Biological Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to biological resources.	No significant effects to vegetation, wildlife, or special status species would occur under the Proposed Action. With implementation of effect minimization measures, the Proposed Action would not result in unauthorized takes of migratory birds or bald or golden eagles. The Proposed Action may affect, but is not likely to adversely affect, the tricolored bat. The Proposed Action would have no effect on any other threatened or endangered species. The Navy is consulting with the U.S. Fish and Wildlife Service regarding the tricolored bat. The results will be included in the Final Environmental Assessment.
Cultural Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no effect to historic properties.	The Navy has determined that the Proposed Action would not result in adverse effects to historic properties and would therefore not result in significant effects to cultural resources.

Notes: % = percent; CBUAS = Carrier-Based Unmanned Aircraft System; DNL = day-night average sound level; GBDA/LSTAR = Ground-Based Detect and Avoid/Lightweight Surveillance and Target Acquisition Radar; I- = Interstate; NAVSTA = Naval Station; U.S. = United States



**Draft Environmental Assessment**  
**Home Basing of the MQ-25A Stingray Carrier-Based**  
**Unmanned Aircraft System**  
**at**  
**Naval Station Norfolk, Virginia**  
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## **Appendices**

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## Abbreviations and Acronyms

<u>Acronym</u>	<u>Definition</u>	<u>Acronym</u>	<u>Definition</u>
ACAM	Air Conformity Applicability Model	GBDAA	Ground-Based Detect and Avoid
ADT	average daily traffic	GHG	greenhouse gas
AGL	above ground level	GSF	gross square feet
AICUZ	Air Installations Compatible Use Zones	HAP	hazardous air pollutant
AM	aircraft movements	I-	Interstate
APE	Area of Potential Effects	ICRMP	Integrated Cultural Resources Management Plan
APZ	Accident Potential Zone	INRMP	Integrated Natural Resources Management Plan
AQCR	Air Quality Control Region	IPaC	Information for Planning and Consultation
ATC	Air Traffic Control	L <sub>max</sub>	maximum sound level
AV	air vehicle	LOS	level of service
AVP	air vehicle pilot	LSTAR	Lightweight Surveillance and Target Acquisition Radar
BASH	bird/animal aircraft strike hazard	MBTA	Migratory Bird Treaty Act
BGEPA	Bald and Golden Eagle Protection Act	MCAS	Marine Corps Air Station
BMP	best management practice	MILCON	Military Construction
CAA	Clean Air Act	MSA	metropolitan statistical area
CBUAS	Carrier-Based Unmanned Aircraft System	MSL	mean sea level
CFR	Code of Federal Regulations	NA	not applicable
CO	carbon monoxide	NAAQS	National Ambient Air Quality Standards
CO <sub>2e</sub>	carbon dioxide equivalent	NAS	Naval Air Station
COA	Certificate of Authorization	NAVSTA	Naval Station
CVW	carrier air wing	NBVC	Naval Base Ventura County
CY	calendar year	NEPA	National Environmental Policy Act
CZMA	Coastal Zone Management Act	NHPA	National Historic Preservation Act
dB	decibel	No.	Number
dBA	A-weighted sound level	NO <sub>2</sub>	nitrogen dioxide
DNL	day-night average sound level	NO <sub>x</sub>	nitrogen oxides
DoD	Department of Defense	NRHP	National Register of Historic Places
EA	Environmental Assessment	NSR	New Source Review
EIS	Environmental Impact Statement	NTIA	Navy Triangle Influence Area
EO	Executive Order	OPNAVINST	Office of the Chief of Naval Operations Instruction
ESA	Endangered Species Act	PFAS	per and polyfluoroalkyl substances
FAA	Federal Aviation Administration		
FY	fiscal year		

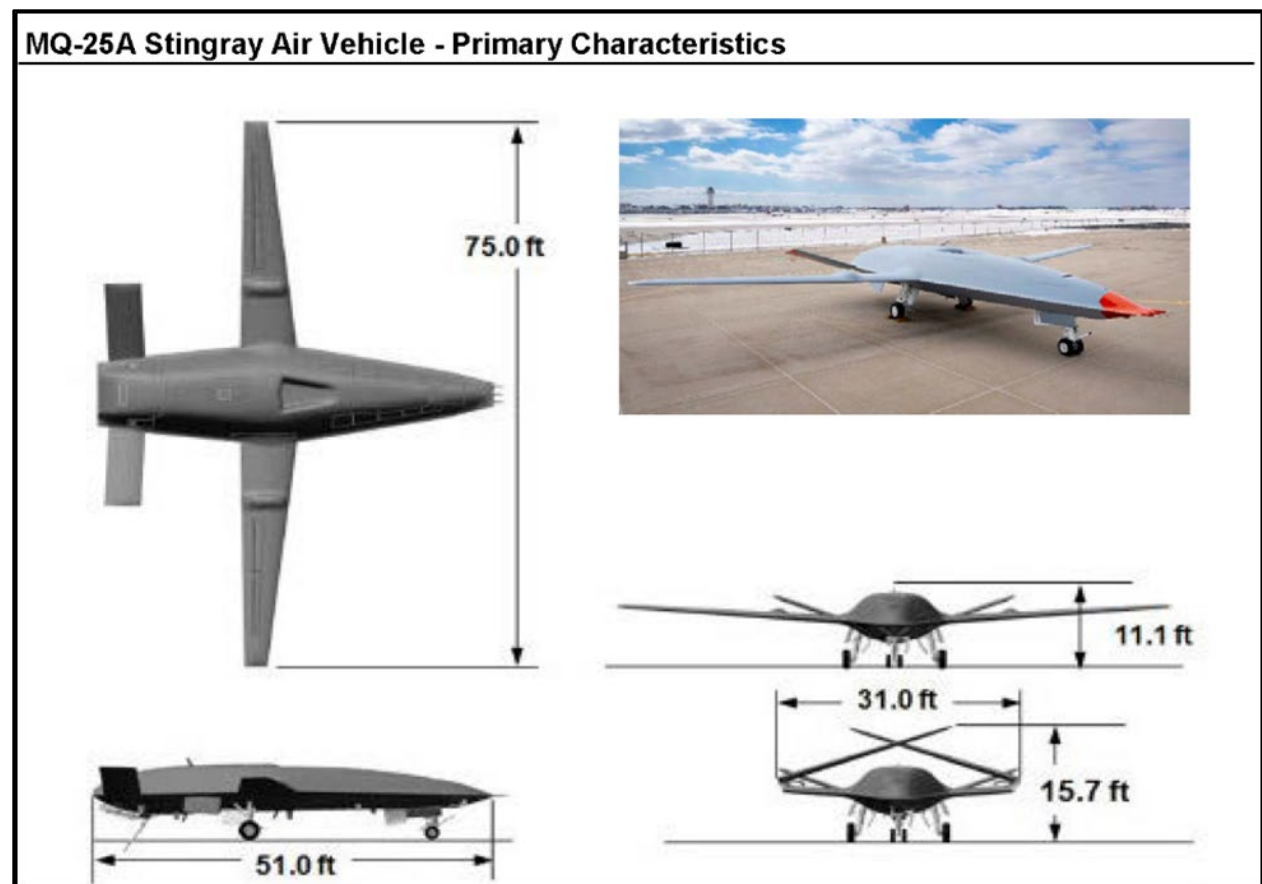
<u>Acronym</u>	<u>Definition</u>	<u>Acronym</u>	<u>Definition</u>
PM <sub>10</sub>	particulate matter less than or equal to 10 microns in diameter	USEPA	United States Environmental Protection Agency
PM <sub>2.5</sub>	particulate matter less than or equal to 2.5 microns in diameter	USFWS	United States Fish and Wildlife Service
POV	privately owned vehicle	VA-NC MSA	Virginia Beach, -Norfolk, -Newport News, Virginia, -North Carolina Metropolitan Statistical Area
ROI	region of influence		
SEL	sound exposure level		
SO <sub>2</sub>	sulfur dioxide	VAW	Airborne Command and Control Squadrons
SSHO	Site Safety and Health Officer	VDEQ	Virginia Department of Environmental Quality
SUA	Special Use Airspace		
tons	short tons	VDOT	Virginia Department of Transportation
tpy	tons per year		
U.S.	United States	VOC	volatile organic compound
U.S.C.	United States Code	VSMP	Virginia Stormwater Management Program
UAS	unmanned aerial system		

# 1 Purpose of and Need for the Proposed Action

## 1.1 Introduction

United States (U.S.) Fleet Forces Command, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy) proposes to home base and operate a new MQ-25A Stingray Carrier-Based Unmanned Aircraft System (CBUAS) (Figure 1-1) squadron at Naval Station (NAVSTA) Norfolk, Virginia.

The Stingray CBUAS is designed to enhance aircraft carrier capability and versatility for the Joint Forces Commander through integration of an effective, sustainable, and adaptable unmanned aerial system into the carrier air wing (CVW). The Stingray CBUAS will be the Navy's first carrier-based unmanned aircraft to function primarily as a mission refueling air vehicle (AV) (specifically developed to extend the combat range of the F/A-18E/F Super Hornet, the EA-18G Growler, and the F-35C Lightning II jet aircraft), extending the range and reach of the CVW as well as providing a secondary recovery tanking capability (refueling close to carrier).



**Figure 1-1 Primary Characteristics of the MQ-25A Stingray Air Vehicle**

Under the Proposed Action, the Navy would:

- home base up to 20 Stingray CBUASs
- renovate an existing hangar and construct supporting infrastructure

- conduct approximately 960 Stingray CBUAS and up to 2,880 chase aircraft annual flight operations
- perform AV maintenance
- provide training for air vehicle pilots (AVPs) and maintainers
- station approximately 600 personnel, plus their family members

The Proposed Action would involve facility construction and renovation between approximately fiscal year (FY) 2026 and FY 2029, followed by a phased move in of the facilities by aircraft and personnel between FY 2031 and FY 2035.

For purposes of this Environmental Assessment (EA), the Department of the Navy (Navy) has voluntarily elected to generally follow those Council of Environmental Quality regulations at 40 Code of Federal Regulations (CFR) parts 1500–1508 that were in place at the outset of this EA, in addition to the Navy’s procedures/regulations implementing NEPA at 32 CFR part 775, to meet the agency’s obligations under NEPA, 42 United States Code (U.S.C.) sections 4321 et seq.

## **1.2 Background**

The Navy anticipates establishing a home base for the Stingray CBUAS on each coast of the continental United States and one permanent detachment in support of the Forward Deployed Naval Forces. The first Stingray CBUAS detachment and all supporting elements would begin operation in the U.S. Pacific Fleet no later than FY 2025. An EA was prepared and a Finding of No Significant Impact was signed for the West Coast Home Basing of the Stingray CBUAS at Naval Base Ventura County, Point Mugu, California, in March 2021.

The East Coast Stingray CBUAS Squadron would be comprised of four detachments, each intended to be deployed with an E-2D Hawkeye Airborne Command & Control squadron. Co-locating Stingray CBUAS squadrons with Airborne Command & Control squadrons ashore is important due to the synergies and efficiencies of the two codependent communities. The first Stingray CBUAS detachment and all support elements are expected to begin at-sea operations on an East Coast-based aircraft carrier no earlier than FY 2027.

The Stingray CBUAS consists of two segments, the AV (aircraft) and the ground control system. The AV is powered by a single, 10,000-pound thrust Rolls Royce AE3007N turbofan engine. Support and handling equipment includes the deck handling system, spares, and repair materials. An AVP uses the ground control station and its associated communication equipment for control of the AV for all phases of the mission, including engine start, taxi, takeoff, mission functions, landing, and engine shutdown.

Navy and Federal Aviation Administration (FAA) coordination for Stingray CBUAS operations at NAVSTA Norfolk began in early 2021. The purpose of the coordination was to discuss and come to agreement on Stingray CBUAS airspace requirements, routes of flight, operational and emergency procedures, and Certificate of Authorization development. A Letter of Agreement has been developed for Stingray CBUAS operations at NAVSTA Norfolk, surrounding airspace, and East Coast warning areas. The Certificate of Authorization would be submitted for official approval to the FAA four months prior to the first Stingray CBUAS flight at NAVSTA Norfolk.



### 1.3 Location

The proposed location for the Stingray CBUAS on the East Coast is Chambers Field at NAVSTA Norfolk, Virginia (Figure 1-2). The mission of NAVSTA Norfolk Chambers Field is to support the operational readiness of the U.S. Atlantic Fleet, primarily by providing facilities and services to support the missions of its tenant commands.



### 1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to base a new East Coast squadron designed to enhance aircraft carrier capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based, multi-mission aerial refueling and intelligence, surveillance, and reconnaissance unmanned aerial system into the CVW

The need for the Proposed Action is to further the Navy's execution of its congressionally mandated roles and responsibilities under 10 U.S.C. section 8062.

10 U.S.C. section 8062: "The Navy shall be organized, trained, and equipped for the peacetime promotion of the national security interests and prosperity of the United States and for prompt and sustained combat incident to operations at sea. It is responsible for the preparation of naval forces necessary for the duties described in the preceding sentence except as otherwise assigned and, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components of the Navy to meet the needs of war."

### 1.5 Scope of Environmental Analysis

This EA includes an analysis of potential direct, indirect, and cumulative environmental effects associated with the Proposed Action and the No Action Alternative. The environmental resource areas analyzed in detail in this EA include public health and safety, noise, transportation, air quality, water resources, biological resources, and cultural resources.

Some environmental resources were eliminated from further detailed analysis in this EA because there would be negligible or no effects to these resources from implementing the Proposed Action. Table 1-1 identifies the unaffected resource areas and provides the rationale for eliminating these resources from detailed analysis.



Figure 1-2 Location Map

**Table 1-1 Resources Eliminated from Detailed Analysis**

<b><i>Resource Area Eliminated from Detailed Analysis</i></b>	<b><i>Rationale</i></b>
Land Use	Construction of facilities and operations would occur at an established airfield where proposed airfield support facilities would be consistent with existing land uses. Therefore, there would be no effects to land use compatibility in the surrounding community. The Proposed Action would be consistent with existing land uses, plans, programs, and policies. Safety and noise are analyzed in Section 3.1, <i>Public Health and Safety</i> , and Section 3.2, <i>Noise</i> . Compliance with the Coastal Zone Management Act Program is discussed in Chapter 5, <i>Other Considerations Required by the National Environmental Policy Act</i> . Therefore, land use was eliminated from further analysis.
Geological Resources	The Proposed Action would occur on previously disturbed areas at NAVSTA Norfolk. Most construction would result in minimal ground disturbance caused by heavy machinery during the demolition and construction process, the areas around the buildings would not be disturbed and no topographic features would be modified or otherwise altered. Construction of the GBDAA tower would require excavation and grading, but this would occur in previously disturbed fill soils. Implementation of best management practices during construction activities would minimize potential effects from erosion and sedimentation into receiving water bodies. Therefore, geological resources were eliminated from further analysis.
Visual Resources	Visual resources include the aesthetic quality of an area or community. Physical features that make up the visible landscape include land, water, vegetation, and man-made features, such as buildings, roadways, and structures. The Proposed Action includes renovation and construction of new facilities. Because no adverse effects are expected on the visual resources from the proposed renovation and construction, this resource was eliminated from further analysis. Potential effects to historic viewsheds are analyzed in Section 3.7, <i>Cultural Resources</i> .
Hazardous Materials and Waste	<p>Routine operations on NAVSTA Norfolk require various hazardous materials that are necessary to perform maintenance, conduct military training activities, and perform administrative and housing functions. Hazardous wastes associated with aircraft maintenance are generated at NAVSTA Norfolk. Hazardous materials and wastes at NAVSTA Norfolk are managed in accordance with Commander, Navy Region Mid-Atlantic Instruction 6280.1A, Regional Consolidated Hazardous Material Reutilization and Inventory Management and the Hazardous Waste Minimization and Disposal Guide.</p> <p>NAVSTA Norfolk has an existing Environmental Restoration Program that actively addresses the cleanup of contaminated sites at the installation. Construction associated with the Proposed Action is located outside of any known contaminated sites. Any contaminated media encountered during construction would be reported, characterized, containerized, transported, and disposed of in accordance with all applicable regulations.</p> <p>The Proposed Action would not interfere with any contamination investigation, including per- and polyfluoroalkyl substances, commonly referred to as PFAS. In addition, the Proposed Action would replace the PFAS containing fire-fighting system in Hangar LP-48 with a non-PFAS system. Therefore, hazardous materials and waste were eliminated from further analysis.</p>

**Table 1-1 Resources Eliminated from Detailed Analysis**

<b>Resource Area Eliminated from Detailed Analysis</b>	<b>Rationale</b>
Surface Waters	No surface water bodies are located within the project area at NAVSTA Norfolk. NAVSTA Norfolk operates under a Virginia Pollutant Discharge Elimination System Permit. NAVSTA Norfolk developed best management practices under the Stormwater Pollution Prevention Plan to control stormwater discharges that would otherwise potentially adversely affect water quality in surrounding surface waters. Additionally, NAVSTA Norfolk operates in accordance with the Virginia Stormwater Management Program and Municipal Separate Stormwater Sewer System general permit for non-industrial stormwater discharges. Therefore, surface water was eliminated from further analysis. Other water resource areas are analyzed in Section 3.5, <i>Water Resources</i> .
Emergency Services	The addition of approximately 600 personnel would result in a minimal demand for emergency services. The increase of personnel and family members associated with the Proposed Action would not be expected to exceed the current capacity of emergency services available at NAVSTA Norfolk or in the surrounding municipalities. In addition, the Proposed Action would not affect the response time or efforts for Navy Region Mid-Atlantic Fire & Emergency Service or force protection personnel. Therefore, emergency services were eliminated from further analysis.
Airspace	Airspace, which is defined in vertical and horizontal dimensions, is considered to be a finite resource that must be managed for the benefit of all aviation sectors including commercial, general, and military aviation. Airfield operations include flight operations at the installation. The Proposed Action does not include changes to airspace or airfield use. Increased operating levels are safely accommodated through adherence to existing standard operating procedures, FAA Orders (including FAA-issued COAs), and other best management practices that clearly govern how flight activities must be conducted, such as conditions specified in the COA that will be obtained for the Stingray CBUAS. UAS operations conducted in the National Airspace System require an approved COA issued from the FAA. A COA allows a UAS to fly pre-coordinated flight routes to Special Use Airspace. Because the Proposed Action does not involve changes to the airspace or airfield operations and the Stingray CBUAS would operate at the NAVSTA Norfolk airfield (Chambers Field) in accordance with all existing standard operating procedures and fly in accordance with all FAA regulations, including operating under a COA, this resource area is not carried forward for analysis. Navy aircraft operations in airspace offshore of Virginia, which consists of the Virginia Capes Range Complex, including areas offshore of NAVSTA Norfolk, are analyzed in Atlantic Fleet Training and Testing Environmental Impact Statements, the most recent of which was finalized in 2018 (Navy, 2018a). These planning documents are updated every seven years. Refer to Section 3.1, <i>Public Health and Safety</i> , for an overview of airspace and an analysis of Stingray CBUAS flight operations safety in controlled and Special Use Airspace.
Infrastructure	Proposed renovation and construction activities may result in temporary interruptions of utilities and some services on NAVSTA Norfolk; however, through advanced planning, it is likely that temporary and isolated disruptions would be avoided. It is not likely that off-base services would be affected by Proposed Action renovation and construction.  NAVSTA Norfolk's Pollution Prevention Plan includes a goal to recycle 50% of all solid waste annually, including construction and demolition waste. As of 2023, Virginia has

**Table 1-1 Resources Eliminated from Detailed Analysis**

<i>Resource Area Eliminated from Detailed Analysis</i>	<i>Rationale</i>
	<p>15.1 years of construction and demolition landfill capacity remaining (VDEQ, 2024a). Construction and debris would not significantly affect landfill capacity.</p> <p>Facilities would be designed to incorporate features that provide maximum energy and water use efficiency. Low Impact Development would be incorporated in the design of stormwater infrastructure for the new facilities, potentially improving stormwater system performance. Off-installation utilities would not be affected. Existing utility services can accommodate Proposed Action new construction.</p> <p>The increase of personnel and their families would result in a 1.2% increase in population at NAVSTA Norfolk, a 0.5% increase in population at Norfolk, and a 0.05% increase for the Hampton Roads region. Existing utility capacities can accommodate this small population increase at the installation, city, and region levels.</p>
Socioeconomics	<p>Proposed Action construction activities would have a minor, temporary economic benefit by supporting the local construction industry. During the operational phase of the Proposed Action, there would be a phased increase of approximately 600 personnel at NAVSTA Norfolk, providing negligible beneficial additional spending at area businesses. CBUAS Stingray personnel would be accompanied by an estimated 1.1 family members (DoD, 2023a). The increase in personnel and family members would represent a negligible 0.001% of the projected population of the VA-NC MSA in 2031 (University of Virginia, 2022). No effects to housing would be expected as there are an estimated 57,315 vacant houses in the VA-NC MSA (USCB, 2023).</p> <p>CBUAS Stingray personnel at NAVSTA Norfolk would be accompanied by (using the most recent Navy family demographics data) an estimated 365 children of which 222 would be school aged and 143 would be preschool aged (DoD, 2023a). No effects to schools would be expected as enrollment for area schools is projected to decline overall during the next five years, resulting in an estimated reduction of 6,593 students for the 2028-29 school year in Norfolk and Virginia Beach alone (University of Virginia, 2024). While some of the preschool-aged children requiring care would be accommodated by Navy-provided childcare, some would utilize community childcare facilities. There are current childcare access issues in the region, stemming primarily from insufficient childcare staffing. Improvements to childcare availability are being addressed by the Navy (two new child development centers planned for the Norfolk Area per the Fiscal Year 2023 National Defense Authorization Act) and by recently signed Virginia legislation supporting the “Building Blocks for VA Families” plan, which will expand available childcare options. Because the number of Proposed Action children requiring care would represent less than 0.3% of current capacity in the MSA (Child Care Aware of Virginia, 2024) and there are programs and policies in place to address childcare access in the near future, there would be negligible adverse effects to future childcare capacity. Due to these negligible effects, socioeconomics was eliminated from further analysis.</p>

Notes: % = percent; CBUAS = Carrier-Based Unmanned Aircraft System; COA = Certificate of Authorization; DoD = Department of Defense; FAA = Federal Aviation Administration; GBDAA = Ground-Based Detect and Avoid; MSA = Metropolitan Statistical Area; NAVSTA = Naval Station; PFAS = per and polyfluoroalkyl substances; UAS = unmanned aerial system; VA-NC MSA = Virginia Beach, -Norfolk, -Newport News, Virginia, -North Carolina Metropolitan Statistical Area; VDEQ = Virginia Department of Environmental Quality



## 1.6 Key Documents

The following are key documents for this EA. Documents are considered to be key because of similar actions, analyses, or effects that may apply to this Proposed Action.

- ***Final Environmental Assessment for the Transition from C-2A to CMV-22B Aircraft at Fleet Logistics Centers Naval Air Station (NAS) North Island, San Diego, CA and Naval Station (NAVSTA) Norfolk, Virginia, June 2018.*** This EA evaluated the potential environmental effects of establishing facilities and functions to support the replacement of the C-2A Greyhound aircraft with the new CMV-22B Osprey aircraft at existing West and East Coast Fleet Logistics Centers NAS North Island, California and NAVSTA Norfolk, Virginia. Under the Proposed Action the Navy would replace 27 legacy C-2A aircraft with 38 CMV-22B aircraft; provide training for aircrew and maintainers; perform aircraft maintenance; construct, renovate, and maintain support facilities and infrastructure; adjust personnel levels associated with the CMV-22B training squadron and maintenance school; and conduct CMV-22B flight training operations.
- ***Final Environmental Impact Statement/Overseas Environmental Impact Statement for Atlantic Fleet Training and Testing, Navy, September 2018.*** This Environmental Impact Statement (EIS)/Overseas EIS analyzed potential environmental effects associated with training and testing military readiness activities in the Atlantic Fleet Training and Testing Study Area, which includes areas of the western Atlantic Ocean along the East Coast of North America, portions of the Caribbean Sea, and the Gulf of America. The study area begins at the mean high tide line along the U.S. coast and extends east to the 45-degree west longitude line, north to the 65-degree north latitude line, and south to approximately the 20-degree north latitude line.
- ***Final Environmental Impact Statement (FEIS) for the Introduction of the F/A-18 E/F (Super Hornet) Aircraft to the East Coast of the United States, Navy, September 2003.*** This EIS analyzed the introduction of the F/A-18 Super Hornet aircraft to the East Coast of the United States. On September 10, 2003, the Navy announced its Record of Decision to home base 8 fleet squadrons (96 aircraft) and the Fleet Replacement Squadron (24 aircraft) at Naval Air Station Oceana, Virginia, and 2 fleet squadrons (24 aircraft) at Marine Corps Air Station Cherry Point, North Carolina. The Super Hornet aircraft were assigned to replace the aging F-14 Tomcat and earlier model F/A-18 Hornet aircraft. In support of the EIS analysis, the Navy conducted aircraft noise modeling at three alternative home basing locations and outlying landing fields including Naval Auxiliary Landing Field Fentress in Chesapeake, Virginia.
- ***Final Environmental Assessment for the Transition of E-2C Hawkeye to E-2D Advanced Hawkeye at Naval Station (NAVSTA) Norfolk, Virginia, and Naval Base Ventura County (NBVC) Point Mugu, California, January 2009.*** This EA evaluated the potential environmental effects associated with establishing facilities and functions to support the replacement of 44 E-2C Hawkeye aircraft with 57 E-2D Advanced Hawkeye aircraft at NAVSTA Norfolk, Virginia, and NBVC Point Mugu, California. The Navy analyzed potential effects associated with an increase in the number of aircraft, personnel transition, new construction, renovation of existing structures, and airfield operations necessary to accommodate the E-2D.
- ***Final Environmental Impact Statement for Testing and Training Activities in the Patuxent River Complex at Naval Air Station Patuxent River, Maryland, March 2022.*** This EIS evaluated the potential environmental effects of continuing military readiness activities in the Patuxent River Complex. NAS Patuxent River is the Navy's primary testing, engineering, and fleet support

activities for naval aircraft, engines, avionics, and aircraft support systems, and is responsible for the scheduling and conduct of military readiness activities within the Patuxent River Complex.

- **Naval Station Norfolk Chambers Field Air Installations Compatible Use Zones Study (AICUZ), October 2009.** An AICUZ Study is a planning document that promotes land use development around air facilities that is compatible with Department of Defense flying missions. The 2009 AICUZ Study provides background information on NAVSTA Norfolk, presents noise contours and zones associated with aircraft operations, establishes Accident Potential Zones (APZs), locates areas of incompatible land uses, and recommends actions to encourage compatible land use.
- **Naval Station Norfolk Integrated Natural Resources Management Plan (INRMP), March 2017.** The INRMP is a long-term planning document designed to guide the management of natural resources to support the installation's mission while protecting and enhancing installation resources for multiple use, sustainable yield, and biological integrity. The INRMP provides plans for the management of fish and wildlife, land, and forest resources; enforcement of natural resources laws and regulations; establishment of specific natural resources management goals and objectives; and protection, enhancement, and restoration of natural resources.
- **Regional Integrated Cultural Resources Management Plan (ICRMP) for Naval Installations in Hampton Roads, Virginia, November 2013.** The ICRMP addresses the management of historic properties located in the Hampton Roads region of Virginia. The ICRMP is a management resource tool to achieve compliance with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended, and other federal preservation laws. The ICRMP facilitates the integration of historic properties into the project planning process.

## 1.7 Relevant Laws and Regulations

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action.

A description of the Proposed Action's consistency with relevant laws, policies and regulations is presented in Chapter 5.1, *Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations* (Table 5-1).

## 1.8 Public and Agency Participation and Intergovernmental Coordination

The Navy has prepared this Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. Through the public involvement process, the Navy coordinates with relevant federal, state, and local agencies and notifies them and the public of the Proposed Action. Input from the public and from regulatory agencies is incorporated into the analysis of potential impacts, as appropriate.

A Notice of Availability of the Draft EA including information about where the Draft EA may be reviewed, the announcement of a 30-day public comment period, and dates and locations of two public open-house meetings was published in *The Virginian-Pilot*. The Draft EA is available on the Navy's website, <https://www.nepa.navy.mil/MQ25-East> and at local libraries (Mary D. Pretlow Anchor Branch Library and Tidewater Community College and City of Virginia Beach Joint-Use Library).

The public is invited to submit comments on the Draft EA by any of the following methods:

- by completing a comment form at one of the public meetings
- electronically, via the project website <https://www.nepa.navy.mil/MQ25-East>
- in writing, by mail to: MQ-25A Project Manager, Naval Facilities Engineering Systems Command Atlantic, Attn: Code EV21DS, 6506 Hampton Blvd, Norfolk, Virginia 23508

The Navy has initiated consultation with the U.S. Fish and Wildlife Service, Virginia Department of Historic Resources, and the Virginia Department of Environmental Quality. A Coastal Consistency Determination was prepared in accordance with the Coastal Zone Management Act and submitted to the Virginia Department of Environmental Quality. Correspondence with agencies will be included in the Final EA.



## 2 Proposed Action and Alternatives

### 2.1 Proposed Action

The United States (U.S.) Fleet Forces Command, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy) proposes to home base and operate a new MQ-25A Stingray Carrier-Based Unmanned Aircraft System (CBUAS) squadron at Naval Station (NAVSTA) Norfolk, Virginia. Under the Proposed Action, the Navy would home base up to 20 Stingray CBUAS; renovate an existing hangar; construct supporting infrastructure; perform air vehicle (AV) maintenance; provide training for air vehicle pilots and maintainers; conduct approximately 960 Stingray CBUAS annual flight operations; conduct up to 2,880 chase aircraft annual flight operations, and station approximately 600 personnel, plus their family members, at NAVSTA Norfolk, Virginia. Chase aircraft would only be used when the Ground-Based Detect and Avoid (GBDAA)/Lightweight Surveillance and Target Acquisition Radar (LSTAR) is not available (e.g., for maintenance, system checks, updates, etc.). The E-2D, which is based at NAVSTA Norfolk, would be the primary chase aircraft; however, C-12, C-38, T-45, and F/A-18 aircraft may be used as chase aircraft in rare instances. The Proposed Action would involve facility construction and renovation between approximately fiscal year (FY) 2026 and FY 2029, followed by a phased occupancy of the facilities by aircraft and personnel between FY 2031 and FY 2035. The Navy would obtain a Certificate of Authorization from the Federal Aviation Administration (FAA) for the proposed Stingray CBUAS flights within the National Airspace System.

### 2.2 Screening Factors

The National Environmental Policy Act's (NEPA's) implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Every conceivable alternative to a proposed action does not need to be explored; rather, a reasonable range of alternatives need to be considered to foster informed decision making. In developing the proposed range of alternatives that meet the purpose of and need for the Proposed Action, the Navy carefully considered the characteristics of potential East Coast home basing options in light of the Stingray CBUAS' primary function as a mission tanker to extend the range and reach of the carrier air wing (CVW). Based on this review, the following screening factors were used to identify those alternatives that meet the purpose of and need for the Proposed Action:

- Proximity to aircraft carrier operating areas. Because the Stingray CBUAS is primarily carrier based, the shore-based location must be close to aircraft carrier operating areas. This proximity allows the Stingray CBUAS to fly to the aircraft carrier and provide aerial refueling services to other aircraft while retaining enough fuel to land on the aircraft carrier with required fuel reserves.
- Present minimal potential conflicts with other aircraft within the National Airspace System. Coastal basing in Department of Defense (DoD)-delegated airspace adjacent to overwater Special Use Airspace (SUA) allows AV launch from the home base, climb and transit into the SUA, and approach and return to the home base with minimal FAA coordination and air traffic de-confliction.
- Compatible with existing airfield operations. Stingray CBUAS basing must integrate efficiently with existing airfield operations. Home basing where other CVW fixed-wing and unmanned

aerial systems (UASs) aircraft operate provides the least disruption to other airfield operations and ensures pilots are accustomed to operating in the same airspace as the Stingray CBUAS.

- Accommodate the Stingray CBUAS accelerated schedule. The Stingray CBUAS is on an accelerated acquisition program. The East Coast home base must have the capacity to accommodate a hangar and ramp, either through existing infrastructure or new construction, by FY 2031.
- Present operational and administrative synergies. To support fleet readiness and ensure efficient use of resources, the following operational and administrative synergies must be considered:
  - Co-locating with Airborne Command and Control Squadrons (VAW) provides operational (including chase plane support) and administrative efficiencies and reduces span of control challenges for Commander, Airborne Command & Control and Logistics Wing.
  - Co-location with existing Fleet Readiness Centers reduces need to generate a new Fleet Readiness Center footprint for intermediate/depot-level maintenance.
- Use existing runways. The Stingray CBUAS requires a runway with a minimum length of 8,000 feet. The use of existing runways maximizes the use of the Navy's infrastructure and is necessary to meet the accelerated schedule.
- Provide shore sailor and family support. The East Coast home base must support sailor and family readiness, medical, and housing needs commensurate with Navy standards for deployable units. A home base with adequate support facilities and capacity to absorb personnel and mission growth maximizes the use of the Navy's infrastructure and helps meet the accelerated schedule.

## 2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors, only one action alternative, the Proposed Action, was identified as meeting the purpose of and need for the project and satisfying all of the screening factors. Accordingly, the Proposed Action is the only action alternative carried forward for analysis in this Environmental Assessment (EA). This document evaluates the No Action Alternative and the Proposed Action.

### 2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The Navy would not home base the Stingray CBUAS at NAVSTA Norfolk. The infrastructure upgrades necessary to accommodate the Stingray CBUAS would not occur. The No Action Alternative serves as the baseline against which the Proposed Action is compared. The No Action Alternative discusses any adverse environmental effects associated with not implementing the Proposed Action.

### 2.3.2 Proposed Action

The Navy proposes to home base and operate a new Stingray CBUAS squadron at NAVSTA Norfolk, Virginia (as described in Section 2.1, *Proposed Action*).

After consideration of the reasonable alternatives and screening factors, the Proposed Action is the only alternative that meets the Navy's purpose of and need. The Proposed Action meets all the screening

factors described in Section 2.2, *Screening Factors*. NAVSTA Norfolk is close to aircraft carrier operating areas (all East Coast carriers are homeported at NAVSTA Norfolk), NAVSTA Norfolk is located on the Atlantic Coast close to SUA, the Stingray CBUAS would be compatible with existing NAVSTA Norfolk airfield operations (including UASs with Helicopter Sea Combat Squadron 22 MQ-8B/C Fire Scout), and NAVSTA Norfolk has the capacity to accommodate a Stingray CBUAS hangar, ramp, and other supporting infrastructure. NAVSTA Norfolk also has VAWs, CVW squadrons, and Fleet Readiness Centers. Co-locating Stingray CBUAS squadrons with VAWs at NAVSTA Norfolk would leverage personnel and maintenance administration, share work center spaces, and reduce span of control challenges for the Airborne Command & Control and Logistics Wing. Finally, NAVSTA Norfolk has an adequate runway and sufficient Navy resources for Sailors and their families.

The following sections provide details on three aspects of the Proposed Action: facility and infrastructure requirements, personnel changes, and AV operations.

### 2.3.2.1 Facility and Infrastructure Requirements

Under the Proposed Action, the East Coast home basing of the Stingray CBUAS would require new facilities and infrastructure. In particular, the Stingray CBUAS would require construction of a two-story support facility, renovation of an existing hangar, installation of a GBDAA/LSTAR tower; repairs to the existing run-up testing pad, and modifications to the west aircraft wash rack. These facility construction elements are further described below in the description of Military Construction (MILCON) P-222. The proposed location of facilities is shown in Figure 2-1.

**MILCON P-222** includes hangar LP48 renovation with two additions; a new LP48A support building north of LP48; paint restriping of the entire apron and west wash rack; replacement of a single mount on one of the two run-up test pads southwest of LP48; and a new GBDAA system and LSTAR tower. Site preparation includes removal of existing utilities and relocation; excavation cut and fill; and grading. It is anticipated that elevation changes of approximately 1 to 3 feet would be required to achieve finished grades.

- **Hangar LP48:** The Proposed Action includes the renovation of approximately 43,000 gross square feet (GSF) and the addition of approximately 7,800 GSF of additional space in LP48. The high bay area in hangar LP48 allows for AV maintenance in a controlled environment. The hangar would also provide the necessary support spaces, including flight planning, briefing, and debriefing areas as well as communications equipment rooms. The additions also include a tool room and battery-charging and storage spaces. The hangar would also be used for some intermediate depot-level maintenance events. A fiberglass antenna platform would be installed over LP48 for placement of antennas that are required to support the Stingray CBUAS mission (78 feet maximum height).
- **Building LP48A:** The Proposed Action includes the construction of LP48A to house the remainder of the functions necessary to support the Stingray CBUAS mission that cannot be placed in LP48. LP48A spaces include maintenance shops, equipment rooms and storage spaces, ground control station rooms, operational training space, crew spaces, and personnel support areas. LP48A would add approximately 43,000 GSF of building space north of the existing LP48 hangar.



- **GBDAA/LSTAR Tower:** The Proposed Action includes the installation of a GBDAA/LSTAR tower to provide airspace awareness to air vehicle pilots on the ground and to allow the UAS to safely operate. Installation would include electrical and fiber-optic tie-ins to the existing installation infrastructure to connect to the Air Traffic Control tower. An emergency diesel generator, estimated at 100 kilowatts is also proposed. The GBDAA/LSTAR tower would be a maximum of 155 feet tall.
- **Wash Rack:** The Proposed Action includes reconfiguration of the existing aircraft wash rack. To make room for Stingray CBUAS parking, the wash rack would be reduced to two spots, which would continue to utilize existing drainage systems.
- **Run-Up Test Pad:** The Proposed Action would replace and install a hold-back fitting and repair pavement with joint routing and sealant application at existing LP138 power check pad in the run-up area located off of Taxiway Echo.

Two parallel diesel emergency generators would be provided for LP48A and LP48. Each generator is anticipated at 500 kilowatts with a 24-hour base fuel tank. In addition to these construction elements, MILCON P-222 would include improvements to stormwater management infrastructure and low impact development facilities; airfield security fence relocation and expansion; and parking lot restriping.

#### 2.3.2.2 Personnel Changes

The Proposed Action requires military, civilian, and contractor personnel to perform Stingray CBUAS functions. Approximately 600 Stingray CBUAS military and civilian personnel would be stationed at NAVSTA Norfolk. Personnel would be added in phases over three to five years.

Personnel associated with the Proposed Action would each be accompanied by an estimated 1.1 family members or 660 people (spouses, children, and adult dependents) (DoD, 2023a). The total military and family personnel is estimated to be 1,260.

#### 2.3.2.3 Air Vehicle Operations

Air vehicle pilot proficiency training would predominantly be virtual (simulations); however, live training flights would ensure operator proficiency. A limited number of AV acceptance inspection and maintenance live flights are also anticipated.

Flights would be coordinated with local Air Traffic Control and airspace organizations, including the Federal Aviation Administration (FAA). The Navy will obtain a Certificate of Authorization from the FAA for the proposed Stingray CBUAS flights within the National Airspace System. To comply with FAA regulations, the Navy would utilize a GBDAA/LSTAR or chase aircraft when the GBDAA/LSTAR is not available (e.g., for maintenance, system checks, updates, etc.) to provide detect and avoid awareness for the Stingray CBUAS.

E-2D aircraft home based at NAVSTA Norfolk would serve as the primary chase aircraft providing detect and avoid as required when the GBDAA/LSTAR is not available. C-12, C-38, T-45, and F/A-18 aircraft may be used occasionally. A chase aircraft would serve as a real-time airborne observer until Stingray CBUAS reach a warning area at 18,000 feet in altitude. A warning area is airspace of defined dimensions, extending from three nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning areas is to warn nonparticipating pilots of the potential danger.

Stingray CBUAS flight operations, consisting of departures and arrivals and would total approximately 960 annual operations by 2035, once all aircraft would be present. An operation represents a single



movement or individual flight in the home base airfield or airspace environment. For example, one Stingray CBUAS departing and returning would be two airfield flight operations. The Stingray CBUAS are not expected to conduct closed-pattern operations (i.e., multiple takeoffs and landings without leaving the vicinity of the airfield). The Stingray CBUAS would conduct airfield operations at NAVSTA Norfolk similar to those performed by other fixed-wing aircraft at the airfield as described below.

- **Departure.** This involves one takeoff and equates to one operation. Departures would occur on Runway 10/28 (Figure 2-1).
- **Arrival.** This involves one landing and equates to one operation. Arrivals would occur on Runway 10/28 (Figure 2-1).

As part of the Proposed Action the Navy is conservatively including up to 2,880 annual Stingray CBUAS chase aircraft flight operations. Chase aircraft would only be used when the GBDAA/LSTAR is unavailable to provide detect and avoid awareness (e.g., for maintenance, system checks, updates, etc.). NAVSTA Norfolk-based E-2D aircraft would perform three airfield operations (takeoff into pattern, approach the airfield, and depart local airspace) for each Stingray CBUAS departure and three airfield operations for each Stingray CBUAS arrival (arrive to local airspace, follow pattern to set up for second approach, and land from pattern). The number of annual chase aircraft operations would be three times the number of Stingray CBUAS operations (960) and would total 2,880 operations (Table 2-1). Note that for the purposes of this EA, E-2D chase aircraft operations are treated as additional operations. It is likely that E-2D chase aircraft operations would be combined with regular E-2D operations, resulting in fewer overall additional operations. In rare instances, chase aircraft may originate from Naval Air Station (NAS) Oceana (F/A-18F), or NAS Patuxent River (C-12, C-38, or T-45). It would not be necessary for aircraft from other air stations to take off or land at NAVSTA Norfolk to perform chase aircraft duties.

**Table 2-1 Chambers Field Proposed Action Stingray CBUAS and Norfolk-Based Chase Aircraft Operations**

Aircraft	Departures			Arrivals			Total Operations
	Takeoff into Pattern	Approach the Airfield	Depart Local Airspace <sup>1</sup>	Arrive to Local Airspace <sup>2</sup>	Follow Pattern to Set Up for Second Approach	Land from Pattern	
Stingray CBUAS	NA	NA	480	480	NA	NA	960
E-2D Hawkeye	480	480	480	480	480	480	2,880
<b>Total Combined Operations</b>	<b>480</b>	<b>480</b>	<b>960</b>	<b>960</b>	<b>480</b>	<b>480</b>	<b>3,840</b>

Notes: CBUAS = Carrier-Based Unmanned Aircraft System; NA = not applicable

<sup>1</sup> Stingray CBUAS includes takeoff.

<sup>2</sup> Stingray CBUAS immediately lands after which the chase aircraft continues flight.

Stingray CBUAS would conduct offshore operations in warning areas including those shown in Figure 2-2. During offshore flight operations, Stingray CBUAS aerial refueling missions may be conducted at altitudes between 5,000 and 25,000 feet. Offshore Navy UAS training, testing, and certification activities are analyzed in the *Supplemental Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) for Atlantic Fleet Training and Testing (AFFT) Phase IV*, which will be completed in 2025; as such they are not further evaluated in this EA.

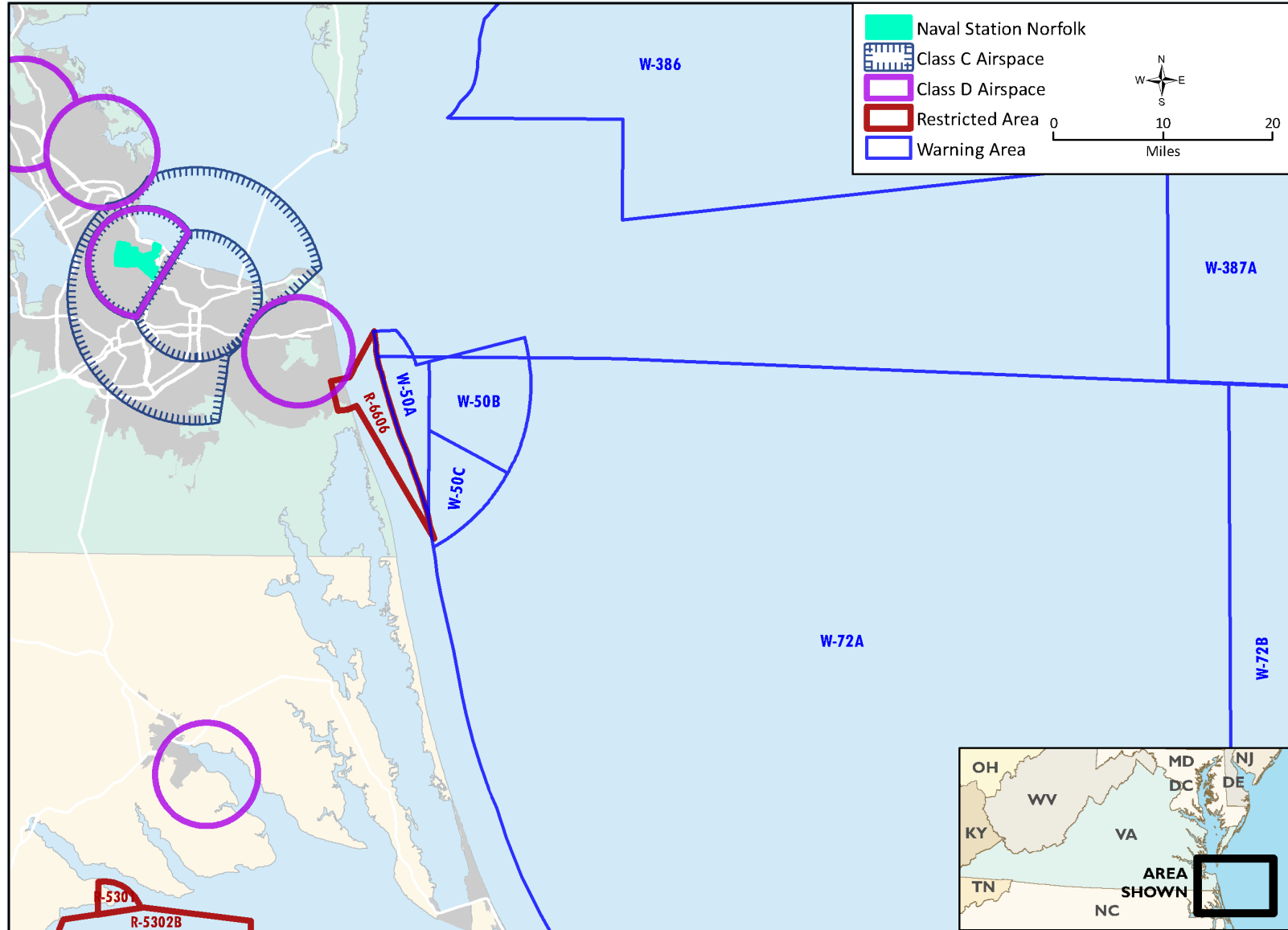


Figure 2-2 Offshore Airspace in the Vicinity of NAVSTA Norfolk

## 2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis

The following alternatives were considered, but not carried forward for detailed analysis in this EA as they did not meet the purpose of or need for the Proposed Action nor satisfy the reasonable alternative screening factors presented in Section 2.2, *Screening Factors*.

### 2.4.1 Home Basing at Other Navy Airfields

Based on the factors listed in Section 2.2, *Screening Factors*, the Navy considered home basing at a variety of East Coast locations including NAS Key West, NAVSTA Mayport, NAS Oceana, NAS Patuxent River, NAS Pensacola, NAS Jacksonville, and NAS Joint Reserve Base New Orleans. As shown in Table 2-2, these airfields did not best meet the screening factors described in Section 2.2 and were dismissed from consideration.

**Table 2-2 Alternative Navy Airfields Considered**

<i>Screening Factor</i>	<i>NAS Key West</i>	<i>NAVSTA Mayport</i>	<i>NAS Oceana</i>	<i>NAS Patuxent River</i>	<i>NAS Pensacola</i>	<i>NAS Jacksonville</i>	<i>NAS Joint Reserve Base New Orleans</i>	<i>NAVSTA Norfolk</i>
Proximate to Aircraft Carrier Operating Areas	✗	✓	✓	✓	✗	✓	✗	✓
Present Minimal Conflicts with Aircraft in National Airspace System	✓	✓	✓	✓	✓	✓	✓	✓
Compatible with Existing Airfield Operations	✗	✗	✓	✗	✗	✗	✗	✓
Accommodate CBUAS Accelerated Schedule	✗	✗	✗	✗	✗	✗	✗	✓
Present Operational and Administrative Synergies	✗	✗	✗	✗	✗	✗	✗	✓
Use Existing Runways	✓	✓	✓	✓	✓	✓	✓	✓
Provide Shore Sailor and Family Support	✓	✓	✓	✓	✓	✓	✓	✓

Notes: CBUAS = Carrier-Based Unmanned Aircraft System; NAS = Naval Air Station; NAVSTA = Naval Station

Checkmark = meets screening factor; X = does not meet screening factor

### 2.4.2 Home Basing at Other Airfields

The Navy considered alternatives that would home base the Stingray CBUAS at other DoD airfields, non-DoD federal airfields, civilian airfields, as well as construction of a new Navy airfield. However, other airfields would not be able to accommodate the CBUAS accelerated schedule or present operational and administrative synergies. Therefore, home basing at other airfields was dismissed from consideration.



## 2.5 Best Management Practices Included in the Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the Navy uses to reduce the environmental effects of designated activities, functions, or processes. BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-3 contains a list of BMPs.

**Table 2-3 Best Management Practices**

<i><b>Best Management Practice</b></i>	<i><b>Description</b></i>	<i><b>Effects Reduced/Avoided</b></i>
General Construction Best Management Practices	These requirements are incorporated into the construction contract and include adherence to construction permit requirements, stormwater management, erosion control, maintenance of construction equipment, spill containment, and spill response.	Reduces potential water quality effects.
Bird/Animal Aircraft Strike Hazard (BASH) Plan Implementation	BASH Management Plan implementation minimizes aircraft risks from potentially hazardous wildlife strikes. The program establishes methods to decrease the attractiveness of the airfield/nearby areas to birds and animals and provides guidelines for dispersing birds and animals when they compromise the safety of operations on the airfield.	Reduces effects to biological resources and airfield safety related to aircraft strikes.
Airfield Operating Procedures	Management of procedures for aircraft approach and departure patterns.	Reduces potential for effects to safety.
Air Installations Compatible Use Zones (AICUZ)	AICUZ studies balance the need for military aircraft operations and community concerns over aircraft noise and accident potential.	Protects the public's health, safety, and welfare and prevents encroachment from degrading the operational capability of the installation.
Encroachment Partnering	Programs such as Readiness and Environmental Protection Integration and Joint Land Use Studies protect military missions by helping remove or avoid land use conflicts near installations and addressing regulatory restrictions that inhibit military activities.	Protects the public's health, safety, and welfare and prevents encroachment from degrading the operational capability of the installation.

**Table 2-3      Best Management Practices**

<b><i>Best Management Practice</i></b>	<b><i>Description</i></b>	<b><i>Effects Reduced/Avoided</i></b>
Community Outreach	Opens lines of communication with the surrounding community and stakeholders through noise complaint hotlines, public meetings, and newspaper advertisements.	Ensures continued partnership between the Navy and its surrounding communities and facilitates the flow of information between the Navy and the local community.
Low Impact Development	The term “low impact development” refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater to protect water quality and associated aquatic habitat.	Provides flood protection, cleaner air, and cleaner water. Low Impact Development practices aim to preserve, restore, and create green space using soils, vegetation, and rainwater harvest techniques.

### 3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing either of the alternatives (Proposed Action and No Action Alternative) and an analysis of the potential direct and indirect effects of each alternative. “Significantly,” as used in the National Environmental Policy Act (NEPA), requires considerations of both the potentially affected environment and degree of potential effects. In considering whether an adverse effect of the proposed action is significant, both the context of the action and the intensity of the effect are examined. In assessing context and intensity, duration of the effect is considered along the extent to which an effect is adverse at some points in time and beneficial in others.

The potential environmental effect can be thought of in terms of the amount of the likely change. In general, the more sensitive the environment, the less intense a potential effect needs to be in order to be considered significant. Likewise, the less sensitive the environment, the more intense a potential effect would need to be to be considered significant. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

All potentially relevant environmental resource areas were initially considered for analysis in this Environmental Assessment (EA). In compliance with NEPA and United States (U.S.) Navy (Navy) regulations, policies, and procedures, the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to effects. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental effect. This chapter includes an analysis of the affected environment and potential impacts to public health and safety, noise, transportation, air quality, water resources, biological resources, and cultural resources.

The potential impacts to the following resource areas are considered negligible or non-existent, so they were not analyzed in detail in this EA: land use, geological resources, visual resources, hazardous materials and wastes, surface waters, emergency services, airspace, and infrastructure (refer to Section 1.5, *Scope of Environmental Analysis*).

#### 3.1 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. Public health and safety within this EA discuss information pertaining to construction activities, operations, and environmental health and safety risks to children.

Public health and safety during construction and renovation activities is generally associated with construction traffic, as well as the safety of personnel within or adjacent to the construction zones.

Operational safety may refer to the actual use of the facility or built-out proposed project, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

The Air Installations Compatible Use Zones (AICUZ) program delineates Accident Potential Zones (APZs), which are areas around an airfield where an aircraft mishap is most likely to happen. APZs are not predictors of accidents, nor do they reflect accident probability. The APZs follow departure, arrival, and flight pattern tracks from an airfield and are based upon historical accident data.

The primary safety concern with regard to military training flights is the potential for aircraft mishaps to occur, which could be caused by mid-air collisions with other aircraft or objects, bad weather, mechanical failures, pilot error, or bird/animal aircraft strike hazard (BASH) events. There is no generally recognized threshold of air safety that defines acceptable or unacceptable conditions. Instead, the focus of airspace managers is to reduce risks through a number of measures. These include, but are not limited to, providing and disseminating information to airspace users, requiring appropriate levels of training for those using the airspace, setting appropriate standards for equipment performance and maintenance, defining rules governing the use of airspace, and assigning appropriate and well-defined responsibilities to the users and managers of the airspace. When these safety measures are implemented, risks are minimized, even though they can never be eliminated.

Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed.

### 3.1.1 Regulatory Setting

The Federal Aviation Administration (FAA) is responsible for ensuring safe and efficient use of federal airspace by military and civilian aircraft. To fulfill these requirements, the FAA has established safety regulations, airspace management guidelines, a civil/military common system, and cooperative activities with the Department of Defense (DoD). While the chances of an accident are remote, the military also defines areas of accident potential for land use planning purposes.

Aircraft safety is based on the physical risks associated with aircraft flight. Military aircraft fly in accordance with Federal Aviation Regulations Part 91, *General Operating and Flight Rules*, which govern such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. In addition, naval aviators must also adhere to the flight rules, Air Traffic Control (ATC), and safety procedures provided in Navy guidance.

Specific Navy requirements are outlined in Office of the Chief of Naval Operations Instruction (OPNAVINST) 3710.7V, *Naval Air Training and Operating Procedures Standardization Program*, which provides processes and procedures that improve combat readiness and achieve a substantial reduction in the aircraft mishap rate thereby safeguarding people and resources. Additionally, Department of the Navy Instruction OPNAVINST 11010.36D and Marine Corps Order 11010.16A, *Air Installations Compatible Use Zones Program*, provides guidance administering the AICUZ program, which recommends land uses that are compatible with noise levels, accident potential, and obstruction clearance criteria for military airfield operations.

Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires a federal agency to “make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”

### 3.1.2 Affected Environment

#### 3.1.2.1 Air Operations

The Navy places an extremely high priority on safety during training and operations. The Navy values the safety of its pilots and of the surrounding communities. Naval aviators and air vehicle pilots (AVPs) are well-trained, and their training includes extensive use of flight simulators and frequent practice in emergency procedures. In addition to training pilots and AVPs on flight safety procedures, the Navy works with communities adjacent to airfields to prevent development that would be incompatible with a military airfield. Highly trained maintenance crews perform routine inspections on each aircraft in accordance with Navy regulations, and maintenance activities are monitored by senior technicians to ensure the aircraft are equipped to safely withstand the rigors of operations.

#### Accident Potential Zones

The Naval Station (NAVSTA) Norfolk AICUZ program delineates Clear Zones and APZs, which are areas around an airfield where an aircraft mishap is most likely to occur, should one occur at Chambers Field (NAVFAC, 2009). APZs are not predictors of accidents. APZs align with departure, arrival, and pattern flight paths, and are designed to minimize potential harm if a mishap were to occur by limiting density and intensity of land uses in the designated APZs. There are three APZs: Clear Zone, APZ I, and APZ II. APZs are, in part, based on the number of operations conducted at the airfield—more specifically, the number of operations conducted for specific flight paths. The runways at NAVSTA Norfolk are Class B runways (NAVFAC, 2009). The AICUZ Instruction defines the components of standard APZs for Class B runways as follows:

- **Clear Zone** – Extends 3,000 feet immediately beyond the runway and has the highest potential for accidents. A Clear Zone is required for all active runways and should remain undeveloped.
- **APZ I** – Extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet. An APZ I area is provided for flight paths that experience 5,000 or more annual operations (departures or approaches).
- **APZ II** – Extends 7,000 feet beyond APZ I with a width of 3,000 feet.

APZ zones for the Class B runways (10/28) at NAVSTA Norfolk are depicted in Figure 3-1. Table 3-1 presents existing land uses contained within APZs.

**Table 3-1 Land Uses Within APZs**

<i>Land Use Type</i>	<i>Clear Zone (acres)</i>	<i>APZ I (acres)</i>	<i>APZ II (acres)</i>	<i>Total (acres)</i>
Commercial	0	2.6	42.7	<b>45.3</b>
Industrial	0	0.9	0	<b>0.9</b>
Institutional/Public Service/Open Space	0	101.1	70.7	<b>171.8</b>
Residential Low Density	75.1	446.2	423.4	<b>944.7</b>
Residential Medium/High Density	7.8	32.0	113.3	<b>153.1</b>
<b>Total</b>	<b>82.9</b>	<b>582.8</b>	<b>650.1</b>	<b>1,315.8</b>

Source: (NAVFAC, 2009)

Notes: APZ = Accident Potential Zone

Does not include on-station acreage or any area over water

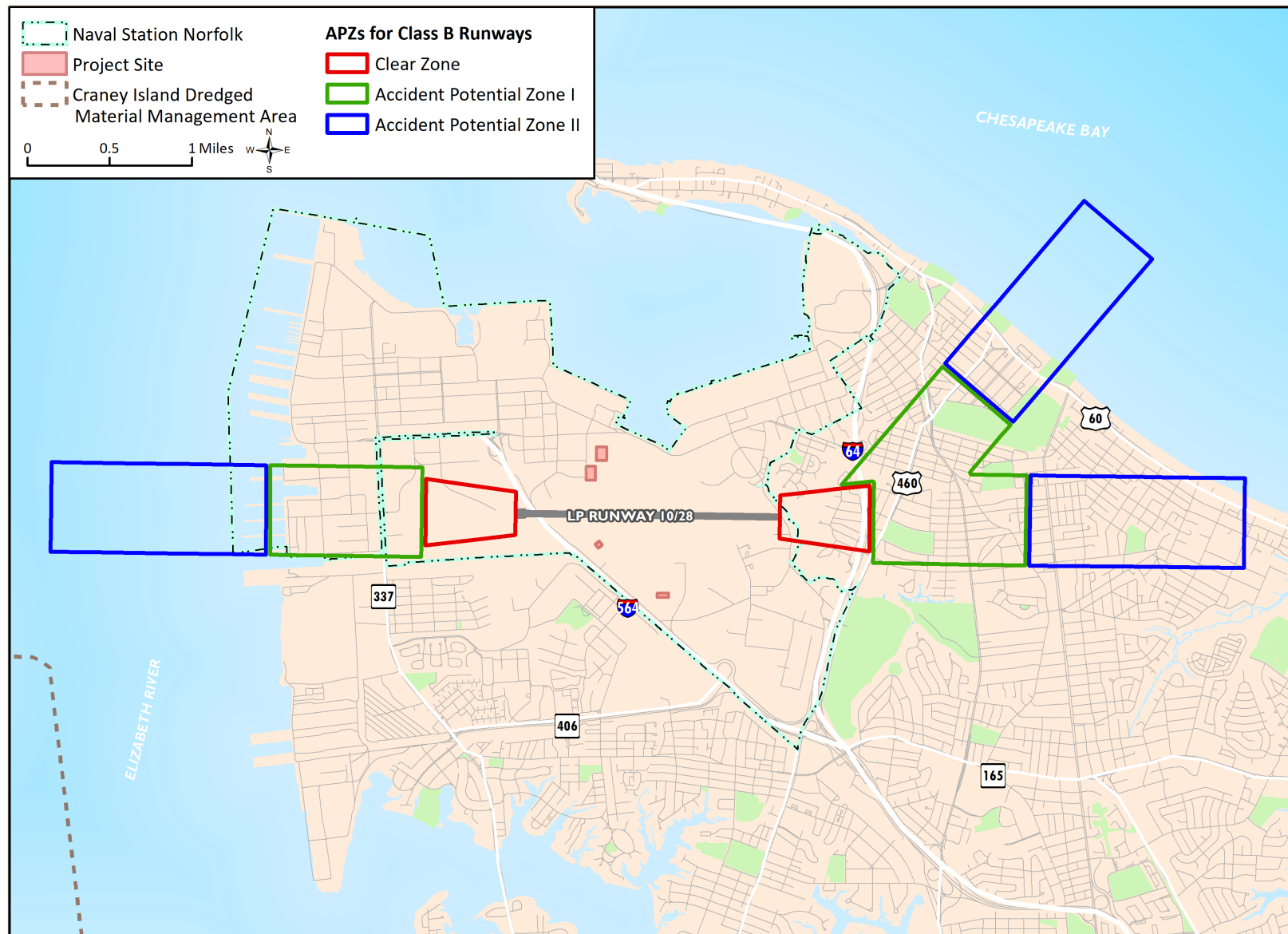
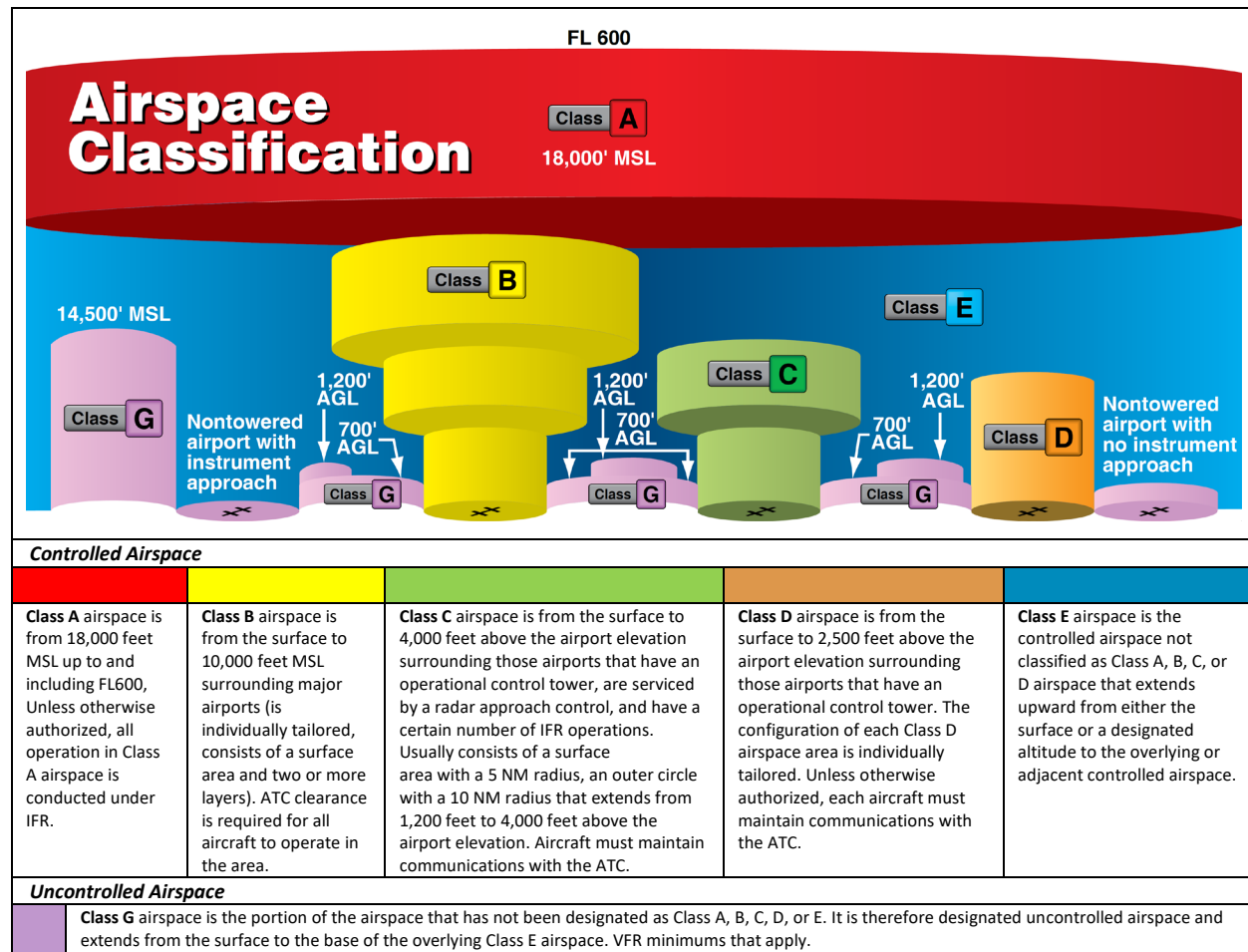


Figure 3-1 Runway 10/28 Accident Potential Zones at Naval Station Norfolk Chambers Field

## Airspace

The following describes controlled airspace within the Stingray CBUAS proposed flight paths. Chambers Field is located within Class D controlled airspace, which roughly encompasses an area within a 4.3-nautical mile radius of the center of NAVSTA Norfolk that extends upward to, but not including, 2,000 feet above ground level (AGL). Norfolk International Airport's Class C controlled airspace overlies all of Chambers Field's Class D Airspace. Naval Air Station (NAS) Oceana is located within Class D controlled airspace, which roughly encompasses an area within a 4.3-nautical mile radius of the center of NAS Oceana (Apollo Soucek Field) and extends upward to, but not including, 2,500 feet AGL (Figure 2-2). Figure 3-2 shows a generalized depiction of controlled airspace classes.



Source: Adapted from FAA (2023)

Notes: AGL = above ground level; ATC = Air Traffic Control; FL = flight level; ft = feet; IFR = instrument flight rules; MSL = mean sea level; NM = nautical miles; VFR = visual flight rules

**Figure 3-2 Schematic Diagram of Airspace Classes**

The main ATC tower located to the south of Runway 10/28 at Chambers Field directs traffic within the Class D airspace entering, exiting, or taxiing at the airfield. The ATC personnel at NAS Oceana and NAVSTA Norfolk normally service aircraft arriving or departing from controlled airspace. They routinely “hand off” or receive air traffic coming from or going to Norfolk International Airport-controlled airspace.

Operational areas for Navy aircraft home based at NAVSTA Norfolk include several Special Use Airspace (SUA) areas. SUA in the region includes restricted areas and warning areas (Figure 2-2). SUA proximate to Chambers Field include:

- **Restricted Area R-6606.** Located offshore to the east of Chambers Field.
- **Warning Areas W-50A/B/C, W-72A/B, W-386, W-387, W-122, and W-110.** Located offshore to the east of Chambers Field.

### Mishaps

The Navy categorizes aircraft mishaps into four primary groups: Class A, B, C, or D. The classification system is based on the severity of injury to the individuals involved and the total property damage. The most severe is Class A, and the least severe is Class D (for reportable mishaps) (DoD, 2019).

From 2016 to present, there have been no Class A aircraft flight mishaps at NAVSTA Norfolk. Class B and C flight mishaps included bird/animal strikes. A weather event during that time period resulted in several aircraft receiving Class A-level damage while they were parked. All mishaps involved manned aircraft.

NAVSTA Norfolk maintains detailed emergency mishap response plans, which outline procedures for responding to an aircraft accident, should one occur. These plans also assign agency responsibilities and prescribe functional activities necessary for responding to mishaps, whether on- or off-base. The initial response focuses on evacuation, fire suppression, and ensuring security of the area, followed by a mishap investigation to determine the cause(s) and prevent future mishaps.

### BASH

BASH is defined as the threat of aircraft collisions with birds and wildlife during aircraft operations. BASH constitutes a safety concern because of the potential for damage to aircraft, or injury to aircrews or local populations if an aircraft crash should occur in a populated area. However, aircraft collisions with birds are most likely to occur during aircraft takeoffs and landings rather than when the aircraft is in transit or enroute to another location. FAA data taken from 1990 to 2020 demonstrates that 71 percent of bird and aircraft collisions occurred below 500 feet (Dolbeer et al., 2021). This altitude typically corresponds to phases of flight associated with takeoffs and landings, e.g., takeoff, climb, approach, and landing roll. These phases of flight accounted for 93 percent of reported phase of flight at time of occurrence of bird strikes for civil aircraft from 1990 to 2020 (Dolbeer et al., 2021).

BASH incidents at NAVSTA Norfolk, while unavoidable, are relatively infrequent and pose little risk to public health and safety. From calendar year (CY) 2013 through CY 2022, a total of 310 BASH incidents (damaging and non-damaging) were reported at NAVSTA Norfolk (USDA, 2023). Of these, approximately 95 percent did not result in any damage to the aircraft. Five percent resulted in a negative effect on flight, e.g., a precautionary landing or aborted takeoff. No strikes resulted in a loss of an aircraft. Strike numbers ranged between 17 and 45 per year with an average of 31 strikes per year. NAVSTA Norfolk supports over 60,000 aircraft movements annually, therefore, approximately one BASH incident occurs per every 1,935 aircraft movements on average.

NAVSTA Norfolk maintains and implements a BASH Management Plan (NAVSTA Norfolk, 2020a) to reduce the potential for BASH by creating an integrated bird control and bird hazard abatement program and by reducing wildlife presence in the airfield and attractiveness of habitat to wildlife (refer to Section 3.6, *Biological Resources*, for additional BASH information). The installation's BASH



Management Plan establishes a Bird Hazard Working Group, which is responsible for collecting, compiling, and reviewing BASH data; identifying and recommending hazard-reducing activities; recommending operational changes when appropriate; preparing informational programs for aircrews; and serving as the point of contact for BASH issues.

### 3.1.2.2 Protection of Children

There are no schools or congregations of children (i.e., schools or playgrounds) within the Clear Zones at NAVSTA Norfolk. Three public elementary schools, one public middle school, one private preschool and one private pre-kindergarten to high school are located within APZs I and II. The estimated population of children within the census tract block groups that are wholly or partially within the 65 decibel (dB) day-night average sound level (DNL) or greater noise zone is 21,553 (DoD recommends noise land use controls beginning at the 65 dB DNL level; refer to Section 3.2, *Noise*). Of those, an estimated 20.3 percent, or 4,375, are under 18 years of age. Census tract block groups are the smallest geographical units for which the U.S. Census Bureau publishes data.

### 3.1.3 Environmental Consequences

This analysis addresses public health and safety of civilians living on or in the vicinity of NAVSTA Norfolk. Specifically, this section provides information on hazards associated with construction of Stingray Carrier-Based Unmanned Aircraft System (CBUAS) support facilities and operation of the Stingray CBUAS. Additionally, this section evaluates the environmental health and safety risks to children.

#### 3.1.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to public health and safety. Therefore, no significant effects would occur with implementation of the No Action Alternative.

#### Public Health and Safety Potential Effects:

- No significant effects to public health and safety.
- Flight and BASH safety risk commensurate to minimal increase in overall flight operations.
- No environmental health and safety risks that may disproportionately affect children.

#### 3.1.3.2 Proposed Action Potential Effects

The study area for public health and safety includes the limits of the proposed project area and the proposed flight paths of the Stingray CBUAS.

#### Construction Activity

There would be negligible effects to public health and safety associated with the Proposed Action. Construction activities would be conducted in accordance with established Navy policies for ensuring the health and safety of the general public. Construction would take place entirely within the secured perimeter of NAVSTA Norfolk, and construction areas would not be accessible by non-construction personnel or the public.

A well-defined work area and exclusion zone around the project area would be implemented during project construction. The work area is defined as the immediate area where work is occurring and where equipment and materials are staged, and the exclusion zone extends beyond the work area to

prevent outside traffic from interfering with operations and any material from exiting the area, and to protect outside personnel not affiliated with the project.

A project-specific Health and Safety Plan would be prepared prior to the start of construction. The plan would identify the chain of command, assign roles and responsibilities, describe potential hazards and measures to minimize or avoid them, prescribe the appropriate level of personal protective equipment for each hazard, and identify emergency response procedures and hospital locations. The designated Site Safety and Health Officer (SSHO) would conduct daily safety briefings, monitor site health and safety, and determine whether site conditions require any changes to the Health and Safety Plan. Any observed health and safety related issues, such as a non-compliance or conformance occurrence or incident, would be documented by the SSHO and corrected. The SSHO would be responsible for ensuring that corrective measures have been implemented, appropriate authorities have been notified and follow-up reports have been completed. The SSHO would also carry emergency equipment, such as a fire extinguisher and first aid kit, in his/her vehicle.

### **Operational Activity**

There is no generally recognized threshold of air safety that defines acceptable or unacceptable conditions. The focus of airspace managers is to reduce safety risks through a number of measures, including providing and disseminating information to airspace users, requiring appropriate levels of training for those using the airspace, setting appropriate standards for equipment performance and maintenance, defining rules governing the use of airspace, and assigning appropriate and well-defined responsibilities to airspace managers and users. When these measures are implemented, safety risks are minimized, even though they cannot be completely eliminated.

The size and shape of the APZs would not be affected by Stingray CBUAS operations because the existing flight paths at Runway 10/28 would be used. Therefore, there would be no change in the existing APZs. Existing emergency response plans would be updated as necessary to account for any requirements of the Stingray CBUAS.

Since the introduction of the first military large turbofan-powered unmanned aerial system (UAS) in 1998 (U.S. Air Force MQ-4 Global Hawk) there have not been any mishaps resulting in U.S. civilian fatalities or injuries. Results of a 2018 study analyzing manned versus unmanned military aircraft mishaps found that the cumulative flight hour Class A mishap rates of the studied UAS (an MQ-9) was not meaningfully different than three manned fighter aircraft types (A-10, F-15, F-22) and lower than one (F-16). The study found that similar to manned aircraft, most mishaps resulted from crewmember error, e.g., not the UAS itself. The study concluded that errors could be mitigated through training. The study summarized that as UAS development continues, improvements to automation will improve safety and the safety record of UASs will eventually exceed that of manned aircraft (Jaussi & Hoffmann, 2018). The Stingray CBUAS is a more advanced UAS than the MQ-9 referenced in the study and incorporates the latest improvements in UAS automation, thereby reducing potential for crewmember error.

Flight operations for the Stingray CBUAS would take place within the existing controlled airspace at NAVSTA Norfolk, as well as in nearby Class D and Class C airspace. Operations would also occur in several SUA areas, which are detailed in Section 3.1.2.1, *Air Operations*. UAS operations conducted in the National Airspace System require an approved Certificate of Authorization (COA) issued from the FAA. A COA allows a UAS to fly pre-coordinated flight routes to SUA. Prior to issuing a COA, the FAA

conducts a comprehensive operational and technical evaluation to determine if the UAS could safely operate with other airspace users. Under the Proposed Action, a Ground-Based Detect and Avoid (GBDAA) system and Lightweight Surveillance and Target Acquisition Radar (LSTAR) tower would be installed and/or chase aircraft would be employed to provide detect and avoid functionality to actively search for potentially conflicting air traffic during phases of Stingray CBUAS flight outside of SUA.

Specific chase aircraft requirements for the Stingray CBUAS at NAVSTA Norfolk would be included in the COA. The details of the COA (including flight paths) would be known to the Stingray CBUAS AVP, the chase aircraft pilot and observer, and ATC. In general, requirements for a chase aircraft include that the pilot cannot perform the job of the Stingray CBUAS observer, and that the observer must be responsible for only one Stingray CBUAS at a time. The observer on the chase aircraft would have a dedicated radio transceiver and circuit to communicate with ATC and the Stingray CBUAS AVP. On launch of a Stingray CBUAS, an already-airborne chase aircraft would establish a flight profile that would allow visual observation of the Stingray CBUAS. The chase aircraft and Stingray CBUAS would then operate as a formation, with the chase aircraft operating in a position that allows for the safe, unimpeded observation of the Stingray CBUAS (e.g., providing the detect and avoid function). The chase aircraft would be in communication with the AVP and ATC and would advise the AVP and air traffic controller of any other air traffic that may need to be deconflicted. This formation would be maintained within the National Airspace System until the Stingray CBUAS reaches SUA. On return from SUA, the chase aircraft and Stingray CBUAS would again operate as a formation while within the National Airspace System upon return to NAVSTA Norfolk where the Stingray CBUAS would then land. Because the Stingray CBUAS would operate with a chase aircraft providing detect and avoid functionality and the observer in the chase aircraft would be in constant contact with both the AVP and ATC during flight within the National Airspace System, the risk of effects to public health and safety from mid-air aircraft collision would be the same as for a conventional manned aircraft.

When the GBDAA/LSTAR is used to provide detect and avoid functionality for the Stingray CBUAS at NAVSTA Norfolk, the risk of effects to public health and safety from mid-air aircraft collision would be similar to the risk when flown with a chase aircraft, with a few added benefits. The GBDAA/LSTAR would provide 360 degrees of traffic awareness at long range. The AVP would be able to see the air traffic information presented on a screen in real time. The GBDAA/LSTAR also offers a three-dimensional sense function along with avoidance algorithms that identify and prioritize threats and generate maneuver recommendations. To date, at airfields where a GBDAA/LSTAR system is in place, there have been more than 8,000 flights and 16,500 incident-free UAS hours flown.

The proposed flight paths for the Stingray CBUAS out to the SUAs are within regulated airspace (Figure 3-3). Stingray CBUAS flight operations would be conducted in accordance with FAA regulations and directives, specific operating manuals, and DoD Flight Information Publications. All emergencies or malfunctions associated with the flight operations would be handled in accordance with established aircraft-specific procedures. In addition, existing standard operating procedures at NAVSTA Norfolk and Norfolk International Airport would be employed to ensure appropriate airspace management by all participating aircraft, which would reduce the potential for mishaps. In the event of a loss link occurrence (where the AVP loses contact with the Stingray CBUAS) in controlled airspace, the AVP would notify the appropriate ATC, and the Stingray CBUAS would automatically fly a pre-planned flight profile to a known location in SUA over the Atlantic Ocean. These loss link flight profiles would be briefed to the ATC who would deconflict air traffic around the Stingray CBUAS until the signal connection is restored.

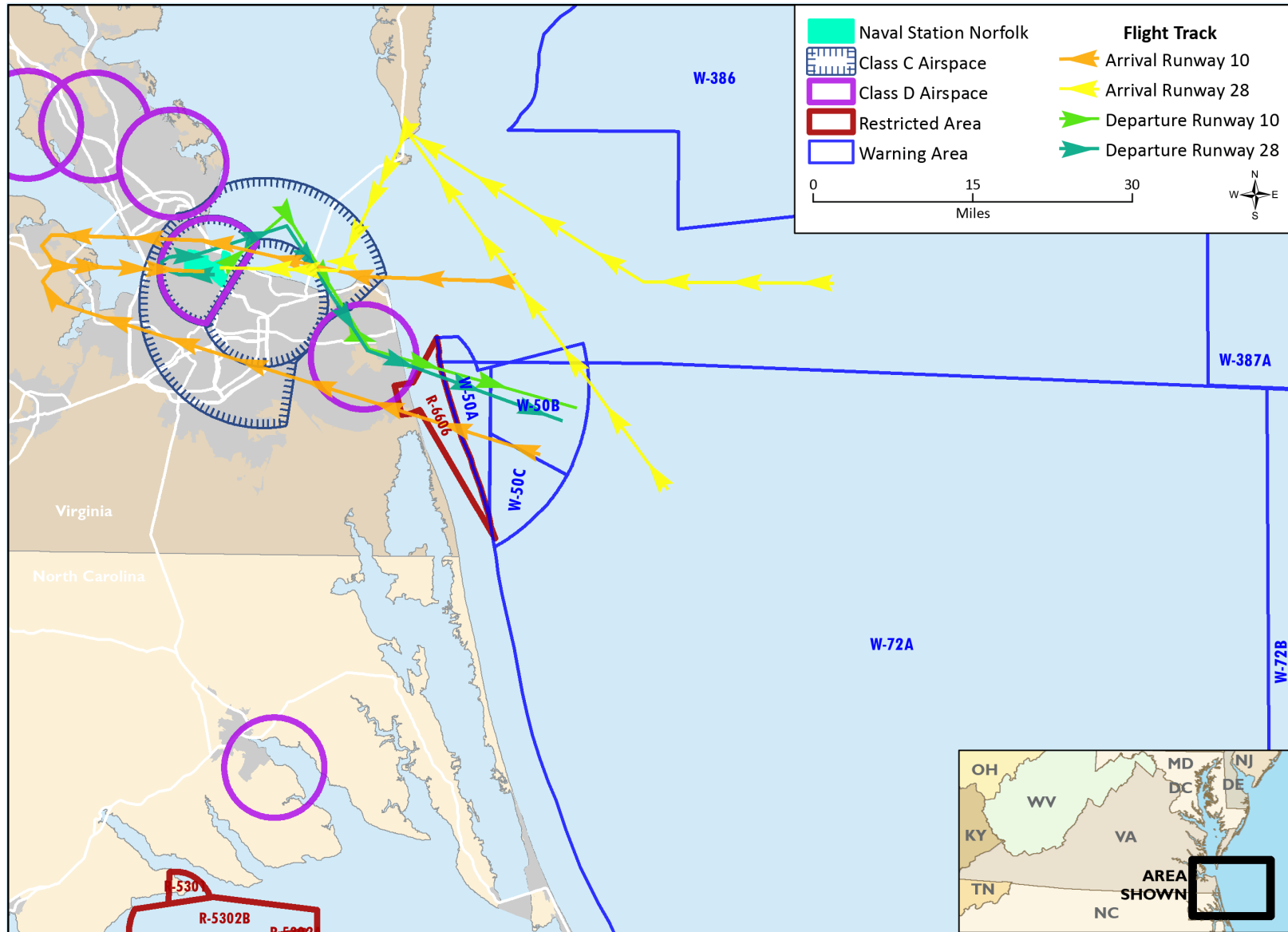


Figure 3-3 Proposed Stingray CBUAS Flight Paths

To further minimize the potential for mishaps, Stingray CBUAS AVPs receive extensive training prior to controlling actual flights. Execution of Stingray CBUAS flight operations are largely autonomous. Flight commands (climb, descend, etc.) given by an AVP (which is equivalent to the pilot in command of a manned aircraft) are received as programmed inputs by the Stingray CBUAS. This includes extensive practice of emergency procedures to minimize the potential for mishaps. The Stingray CBUAS is also designed with multiple, redundant safety systems and automation – e.g., power supply, communications, and navigation controls to minimize mishap risk.

Therefore, the Proposed Action would result in negligible increases to mishaps proportionate to the increases in operations that would potentially expose the public to safety risks. However, due to the reasons discussed above, the increase would not be significant.

Stingray CBUAS flight operations would be subject to BASH risks. NAVSTA Norfolk maintains a BASH Management Plan to reduce the potential for collisions between aircraft and birds or other animals (refer to Section 3.1, *Public Health and Safety*, and Section 3.6, *Biological Resources*). Stingray CBUAS flight operations would increase the total annual airfield operations at NAVSTA Norfolk by less than 2 percent or 960 annual operations (6 percent or 3,840 total additional NAVSTA Norfolk operations when including all Stingray CBUAS and chase aircraft operations). Stingray CBUAS operations would be expected to result in an increase of 0.5 strikes per year (2.0 strikes when including all Stingray CBUAS and chase aircraft). As noted previously, 95 percent of recorded bird strikes at NAVSTA Norfolk did not result in any damage to aircraft. No aspect of the Proposed Action would create attractants with the potential to increase the concentration of birds in the vicinity of the airfield. NAVSTA Norfolk would continue to manage BASH in accordance with the installation's BASH Management Plan. Therefore, no significant effects on public health and safety from BASH would be expected.

### **Protection of Children**

Construction noise associated with implementation of the Proposed Action would be temporary and intermittent and, to the extent practical, would be performed during daytime hours. No construction would occur near any schools, daycare centers, or other areas where children congregate.

Operationally, flight paths would fly over residential areas, and would fly over facilities where children are known to congregate such as schools and daycare centers; however, the risk presented by these overflights, based on the preceding analysis (Operational Activity), would not be significant and would not present a disproportionate risk to children. Potential increases in noise from Stingray CBUAS operations and accompanying primary E-2D chase aircraft are expected to be 0.3 dB DNL or less. Noise contours modeled for the airfield would not appreciably change (refer to Section 3.2, *Noise*). The increase in operations would be commensurate within the typical fluctuations in aircraft operations at military airfields from one year to the next.

Air emissions for criteria pollutants from construction and operations would be below *de minimis* concentrations and would not affect air quality in the region (refer to Section 3.4, *Air Quality*) and would therefore not disproportionately affect children.

The use of fencing and barricades would prevent unauthorized persons from entering the installation and the proposed project area during construction and operations. Construction and operations would be managed to ensure all hazardous materials and equipment are stored safely at all times.

Therefore, the Navy has determined that there are no environmental health and safety risks associated with the Proposed Action that would disproportionately affect children.

### 3.2 Noise

This discussion of noise includes the types or sources of noise and the associated noise-sensitive points of interest in the human environment. Noise in relation to biological resources and wildlife species is discussed in Section 3.6, *Biological Resources*.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure level, measured in dB
- Frequency – the number of cycles per second the medium vibrates, measured in Hertz
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human responses to noise include annoyance and sleep disturbance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual. While aircraft are not the only sources of noise in an urban or suburban environment, they are readily identified by their noise output and are given special attention in this EA. The likelihood of sleep disturbance is minimal (3 percent or less) in residences exposed to an outdoor overflight sound exposure level (SEL) of 94 dB or less, as estimated using a method recommended by the DoD Noise Working Group (DoD Noise Working Group, 2009). A primer on noise and the analysis methods used in this assessment, including assessment of potential sleep disturbance, is provided in Appendix B, *Noise*.

#### 3.2.1 Regulatory Setting

Department of the Navy Instruction OPNAVINST 11010.36D and Marine Corps Order 11010.16A, *Air Installations Compatible Use Zones (AICUZ) Program*, provides guidance administering the AICUZ program that recommends land uses that are compatible with aircraft noise levels. For land use planning purposes, noise levels below 65 dB DNL are considered areas of low effect. Residents living in areas with noise exposure less than 65 dB DNL may still be annoyed by aircraft noise, and some may complain, but OPNAVINST 11010.36D does not establish land use recommendations for these areas. Noise levels of 65 to 74 dB DNL are considered to be of moderate effect, where some land use controls are needed. These land use controls could include zoning changes, the implementation of overlay zoning, building code modifications, and other government-implemented tools. Noise levels of 75 dB DNL and above are the most severely affected and require the greatest degree of compatible land use controls. DoD Instruction 4715.13, the DoD Operational Noise Program, outlines the DoD's approach to addressing military noise issues related to test and training operations. This program aims to maintain military readiness while incorporating military noise management principles into plans and programs for installations, operational ranges, training areas, and offshore operating areas.

#### 3.2.2 Affected Environment

The dominant noise source in the vicinity of NAVSTA Norfolk is aircraft operations (Navy, 2018b). Other sources of noise at NAVSTA Norfolk stem from various industrial activities throughout the installation. These

activities include the operation and maintenance of equipment, such as equipment for steam generation. Areas of the installation adjacent to roads (e.g., Interstate [I-] 564) experience traffic noise. Areas immediately outside the boundaries of the installation include open water and land areas that are highly urbanized. Urbanized land areas typically experience human-generated sounds, such as traffic, consistently throughout the day. Other off-installation noise-generating activities, such as construction projects, may occur intermittently near the construction activities.

A noise-sensitive land use is typically defined as an area where noise interferes with normal activities associated with its use. Common noise-sensitive uses include residential, educational, health, and religious facilities. The closest off-installation noise-sensitive locations to Proposed Action activities include residences located east of the NAVSTA Norfolk main runway.

### 3.2.2.1 Aircraft Noise

The 2018 *Final Environmental Assessment for the Transition from C-2A to CMV-22B Aircraft at Fleet Logistics Centers at Naval Air Station North Island, California and Naval Station Norfolk, Virginia* (CMV-22B EA) evaluated noise effects from aircraft at NAVSTA Norfolk under multiple operational scenarios (Navy, 2018b). The Navy selected CMV-22B Alternative 1 and is in the process of implementing that alternative. Transition from the C-2A to the CMV-22B began in 2023 and will be complete by 2028. NAVSTA Norfolk airfield operation counts in recent years have been similar to operation counts assessed in the CMV-22B EA Alternative 1 (NAVSTA Norfolk, 2023). Environmental conditions described in the CMV-22B EA for Alternative 1 approximate conditions that will exist when the proposed Stingray CBUAS basing is complete, and the Proposed Action is implemented between fiscal year (FY) 2031 and FY 2035 and are therefore considered baseline conditions for this Stingray CBUAS home basing analysis.

Table 3-2 lists the types of aircraft that operate at NAVSTA Norfolk. Aircraft operations at Navy installations vary year by year in response to varying training needs and other factors. The annual operations counts listed in Table 3-2 reflect CMV-22B EA Alternative 1. Based propeller-driven aircraft and rotorcraft (i.e., E-2D, MH-60S, MH-53E, and CMV-22) make up approximately 89 percent of total NAVSTA Norfolk operations. Transient aircraft make up approximately 11 percent of total operations. However, noise levels generated by transient jet aircraft (e.g., C-40B/C, C-5B/C/M, and F/A-18E/F) are typically greater than those generated by based aircraft. As a result, transient aircraft operations at NAVSTA Norfolk are distinctive and noticeable in the context of other ongoing operations.

**Table 3-2 Baseline Annual Aircraft Operations at NAVSTA Norfolk**

Category	Aircraft Type	Operations (Annual)
Based	E-2D	12,948
	MH-60S	28,346
	MH-53E	6,309
	CMV-22	11,696
Transient	C-40B/C	4,572
	C-5B/C/M	392
	C/KC-130E/H/J/T	1,446
	F/A-18E/F	1,186
<b>Total</b>	<b>Various</b>	<b>66,895<sup>1</sup></b>

Sources: (Navy, 2018b; NAVSTA Norfolk, 2019; NAVSTA Norfolk, 2020b; NAVSTA Norfolk, 2021; NAVSTA Norfolk, 2022; NAVSTA Norfolk, 2023)

<sup>1</sup>The average number of airfield operations in 2019 through 2023 were similar to operation counts assessed in Alternative 1 of the *Final Environmental Assessment for the Transition from C-2A to CMV-22B Aircraft at Fleet Logistics Centers at Naval Air Station North Island, California and Naval Station Norfolk, Virginia* (Navy, 2018b).

### 3.2.2.2 Installation Noise Environment

Baseline noise levels, as shown in Figure 3-4, are the same as were described for Alternative 1 in the CMV-22B EA (Navy, 2018b). As described in the CMV-22B EA, noise-sensitive areas exposed to elevated aircraft noise levels near NAVSTA Norfolk include residential areas and other sensitive uses (e.g., religious facilities, schools, etc.) in communities east of the airfield. Communities affected by noise levels greater than 65 dB DNL include North Granby, Northside, and East Ocean View. The closest off-installation noise-sensitive points of interest are residences east of the main runway.

As described in Appendix B, Section B.2, *Noise Metrics*, SEL provides a measure of the total sound energy of a noise event normalized to a one second duration, which allows comparison of disparate events. Table 3-3 presents SEL for departure operations of commonly operated aircraft at typical power settings and/or airspeeds. Departure operations were selected for comparison because aircraft require greater power settings during departures, which typically creates greater noise levels experienced on the ground. Table 3-3 uses the speeds and power settings from the CMV-22B EA. Aircraft sound levels are provided for overflight at an altitude of 1,000 feet to provide a common point of comparison. One thousand feet AGL is also a common approximate altitude at which departing jet aircraft overfly the closest residences located immediately beyond the eastern base boundary.

**Table 3-3 Noise Levels for Departures of Commonly Operated Aircraft at NAVSTA Norfolk**

Category	Aircraft Type	SEL (dB) <sup>1</sup>
Based	E-2D	93
	MH-60S	85
	MH-53E	93
	CMV-22	90
Transient	C-40B/C	94
	C-5B/C/M	100
	C/KC-130E/H/J/T	90
	F/A 18E/F	117

Notes: % = percent; dB = decibel; NAVSTA = Naval Station; SEL = sound exposure level

<sup>1</sup> Sound levels were calculated using NAVSTA Norfolk weather conditions with power settings and/or airspeeds as follows: E-2D at 5,100 indicated shaft horsepower and 165 knots; H-60 at 100 knots; H-53 at 100 knots; MV-22 at 0 degrees nacelle tilt and 100 knots; C-40 at 17,941 pounds of thrust and 210 knots; C-5 at 98% engine speed at position N1 and 160 knots; C-130 at 10,000 inch-pounds and 180 knots; and F/A-18E/F at 94% engine core speed and 250 knots.

### 3.2.3 Environmental Consequences

Analysis of potential noise effects include estimating likely noise levels from the Proposed Action and determining potential effects to noise-sensitive points of interest.

#### 3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The Navy would not home base or operate Stingray CBUAS at NAVSTA Norfolk and there would be no change to baseline noise levels. Therefore, no significant effects due to the noise environment would occur with implementation of the No Action Alternative.

#### Noise Potential Effects:

- No significant effects.
- Stingray CBUAS and chase aircraft noise levels and number of annual operations would not result in discernable effects to the noise environment.



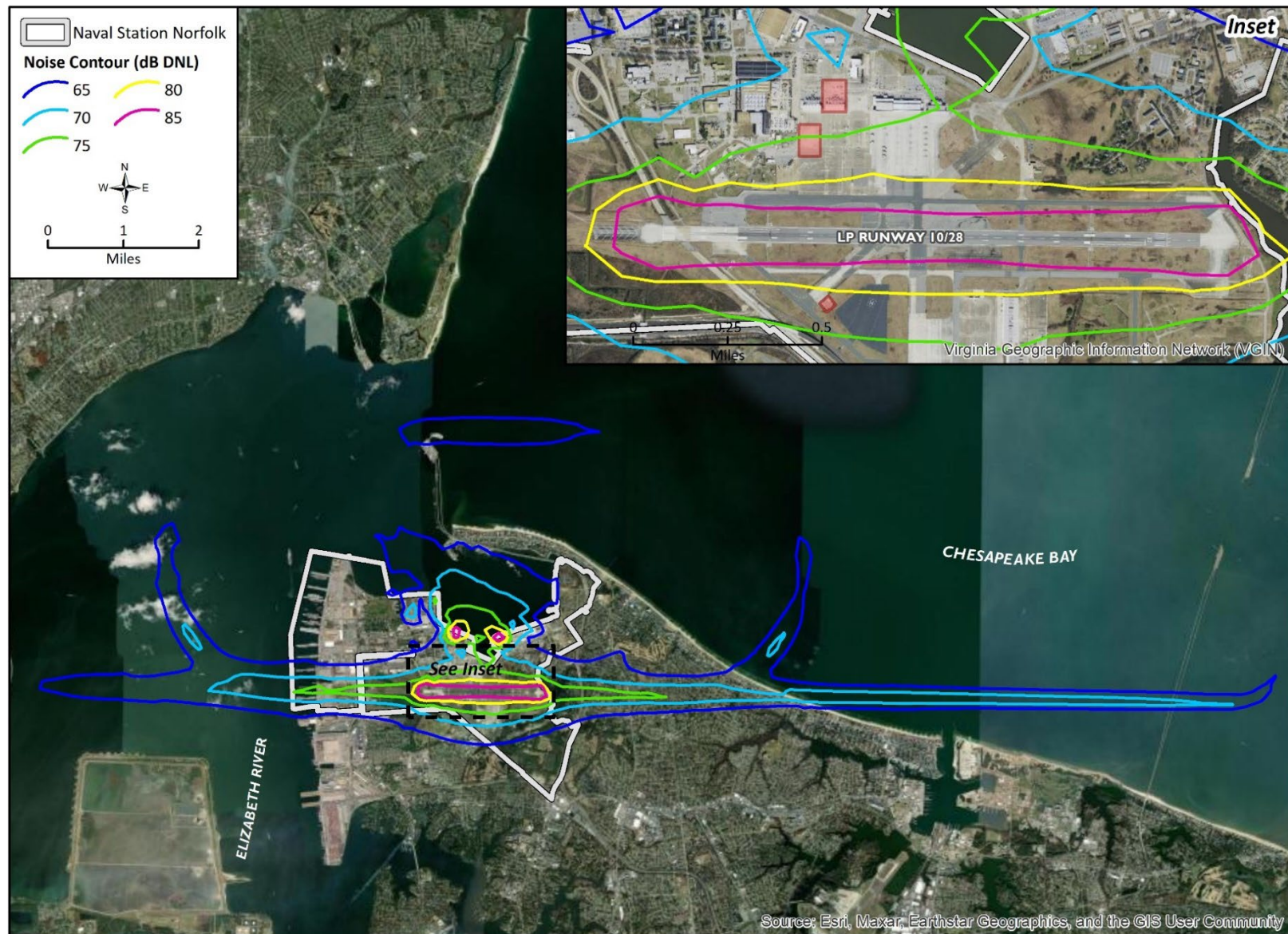


Figure 3-4 Baseline DNL Contours

### 3.2.3.2 Proposed Action Potential Effects

The study area for the Proposed Action includes areas in which component activities of the Proposed Action may result in effects to noise-sensitive receivers. These activities include construction and operational activities, as described in Section 2.3.2, *Proposed Action*.

#### Construction Activity

Construction activity associated with the Proposed Action in support of Stingray CBUAS operations would include construction of a two-story support facility; a GBDAA/LSTAR tower; renovation of an existing hangar; repairs to the existing power check pads, and modifications to the west aircraft wash rack at Chambers Field.

As described in Appendix B, Section B.2.3, *Maximum Sound Level*, the greatest dBA measured during a single event is called  $L_{\max}$ . Construction noise varies by type of equipment and ranges from an  $L_{\max}$  of 70 to 95 dB when measured at 50 feet (FHWA, 2006). That range of noise levels includes pile driving equipment, which would create the greatest sound levels. Noise levels at other distances without obstructions can be estimated using this formula provided by the Federal Highway Administration (FHWA, 2006):

$$(1) L_2 = L_1 + 20 \cdot \log(D_1/D_2),$$

where  $D_1$  and  $D_2$  represent the known and target distances, respectively.  $L_1$  refers to the known sound level and  $L_2$  results in the estimated sound level at distance  $D_2$ .

The nearest off-base noise-sensitive locations to proposed construction activity are privatized military housing residences located immediately south of I-564. The residences are approximately 1,200 feet from the nearest construction project and would experience noise levels from 42 to 67 dB  $L_{\max}$  due to intermittent construction activity. The I-564 transportation corridor, which is located between the construction activity and the privatized military housing, is heavily used by automotive and rail traffic. Traffic in this corridor generates noise levels comparable to or exceeding noise levels generated by the proposed construction activity. In this context, the proposed construction activity, which would occur during normal working hours, would not be expected to cause a significant increase in ambient noise levels off-base in noise-sensitive areas.

Under the Proposed Action, no significant effects from construction-related noise would occur. Noise-sensitive locations, such as the closest off-installation residences, would be exposed to intermittent periods of increased noise during construction activities occurring sporadically over a period of two years. Noise levels from proposed construction may be noticeable at times when aircraft are not operating nearby but would not be expected to cause meaningful changes to the existing noise conditions.

#### Operational Activity

**Cumulative Noise Levels.** The Proposed Action would add 960 annual Stingray CBUAS flight operations and up to 2,880 chase aircraft operations (primarily E-2D aircraft) annually to NAVSTA Norfolk. These additional operations would increase overall operations at the airfield by 6 percent. The formula provided below (Kinsler et al., 1999) is used to estimate changes in noise levels due to changes in number of operations:

$$(2) L_2 = L_1 + 10 \cdot \log(N_2/N_1),$$

where  $N_1$  and  $N_2$  represent the baseline and Proposed Action number of operations, respectively,  $L_1$  refers to the known sound level, and  $L_2$  is the resulting estimated sound level at the same distance for a

change in operations. The initial number of operations refers to the total aircraft operations of 66,895 described in the CMV-22B EA Alternative 1. The proposed number of operations is 70,735, which is the baseline number combined with the proposed Stingray CBUAS and chase aircraft operations. In this case, the input sound level metric is DNL so the resulting output for L2 is also DNL.

Using formula (2), the 6 percent increase in airfield operations would result in an estimated increase of 0.3 dB DNL under the Proposed Action. This estimation assumes the new operations generate the same individual overflight noise level and frequency spectra as baseline operations, and are conducted during the late night (i.e., between 10:00 p.m. and 7:00 a.m.) at a rate equal to or less than baseline operations. As the existing DNL reflect noise generated by multiple aircraft types, the Stingray CBUAS operations are further compared to existing aircraft at NAVSTA Norfolk to better understand anticipated changes in noise levels.

**Single-Event Noise Levels.** As described in Appendix B, Section B.2.5, *Noise Modeling and Methodology*, “NOISEMAP” and “Rotorcraft Noise Model” software are used to calculate aircraft noise levels. Because the Stingray CBUAS is in development and its noise levels have not yet been measured, it cannot currently be modeled directly with the NOISEMAP software. Because the Cessna Citation X aircraft is similar to the CBUAS in several ways, it was used as a conservative surrogate for the Stingray CBUAS for the purpose of calculating and comparing sound levels in this EA. Documented measured noise levels are available for the Citation X aircraft. The Citation X aircraft is equipped with two AE3007C engines, a variant of the type used in the Stingray CBUAS. The Stingray CBUAS would be capable of 10,000 pounds of thrust while the Citation X engines are capable of a total of 13,000 pounds of thrust. Noise levels are primarily dependent upon thrust among similar types of engines. The Citation X, during departure operations at NAVSTA Norfolk, would generate SEL of 85 dB when at 1,000 feet above the ground while using the same thrust as the Stingray CBUAS. For reference, the full thrust takeoff power of the Citation X generates SEL of approximately 90 dB for the same altitude. Departing jet aircraft typically overfly the closest residences located immediately beyond the eastern base boundary at approximately 1,000 feet above the ground.

As noted in Section 2.3.2.3, *Air Vehicle Operations*, the Navy would conduct up to 2,880 chase aircraft annual flight operations. Chase aircraft would only be used when the GBDAA/LSTAR is not available (e.g., for maintenance, system checks, updates, etc.). Chase aircraft would be primarily E-2D aircraft that are based at NAVSTA Norfolk. These aircraft would follow existing flight patterns and would generate sound levels identical to sound levels generated by E-2D aircraft currently. Prior to a Stingray CBUAS departure, the chase aircraft would depart the runway and then circle using standard local flight patterns to overfly the runway a second time at 1,000 feet AGL. The second overflight would be timed to coincide with the Stingray CBUAS departure, and the two aircraft would then proceed together away from the airfield. Because the chase aircraft must accomplish a departure and an approach to the runway prior to joining the departing Stingray CBUAS, chase aircraft would accomplish three airfield operations for each Stingray CBUAS departure. On returning to NAVSTA Norfolk after a mission, the chase aircraft would remain airborne while the Stingray CBUAS lands and would then conduct a circling maneuver to land. Chase aircraft following these procedures would typically accomplish three airfield operations for each Stingray CBUAS operation. Therefore, the number of chase operations conducted annually would be three times the number of Stingray CBUAS operations (960) and would total 2,880 operations. The Navy would use C-12, C-38, T-45, and F/A-18 aircraft as chase aircraft in rare instances. These aircraft generate sound levels that are the same as or comparable to sound levels generated by based and transient aircraft types currently operating at NAVSTA Norfolk (see Table 3-3). Their use on an

occasional basis and in a transient capacity would be consistent with ongoing transient aircraft operations. Because SEL values generated by MQ-25 and commonly used chase aircraft would be moderate (i.e., 94 dB or less), and relatively infrequent, no substantive change in the likelihood of sleep disturbance would be expected.

When compared with existing aircraft responsible for contributing to baseline noise contours (refer to Table 3-3 and Figure 3-4) the Stingray CBUAS would be quieter than five of the aircraft currently operating at NAVSTA Norfolk, and roughly equivalent to two (C-130 and MV-22). The Stingray CBUAS would be 16 to 27 dB quieter than ongoing transient fighter aircraft operating at NAVSTA Norfolk (e.g., F/A-18E/F) in terms of SEL. Chase aircraft would primarily be E-2D aircraft and would generate sound levels identical to ongoing E-2D operations. Because most of the operations ongoing at NAVSTA Norfolk are as loud or louder than Stingray CBUAS or the primary chase aircraft, the formula (2) calculation of an increase of 0.3 dB DNL likely overestimates the potential increase in noise from the Proposed Action.

**Operational Noise Summary.** The 960 additional annual aircraft operations that would be generated by the Stingray CBUAS and 2,880 chase aircraft airfield operations would increase the total number of operations flown at NAVSTA Norfolk by 6 percent from 66,895 to 70,735. As with other Navy airfields, the volume of annual airfield operations at NAVSTA Norfolk fluctuates from year-to-year based on training requirements and other factors. The proposed 6 percent increase in the number of airfield operations would be within the typical fluctuations in aircraft operations at military airfields from one year to the next.

Under the Proposed Action, no significant effects from noise related to airfield operations would occur. Given the 6 percent increase in annual operations proposed for the Stingray CBUAS, the conservative 0.3 dB increase in DNL predicted by formula (2), and the relatively low single-event noise level SELs, noise-sensitive points of interest and DNL noise contours at NAVSTA Norfolk would not be expected to experience a perceptible change from existing conditions due to Stingray CBUAS and chase aircraft operations.

### 3.3 Transportation

This discussion of transportation includes vehicular traffic and alternative transportation. Vehicular traffic refers to the movement of vehicles on roadway networks and street systems, and alternative transportation refers to ridesharing and mass transit.

#### 3.3.1 Regulatory Setting

The Virginia Department of Transportation (VDOT) is responsible for building, maintaining, and operating the state's roads, bridges, and tunnels. In addition, through the Commonwealth Transportation Board, it provides funding for airports, seaports, rail, and public transportation (VDOT, 2022). Hampton Roads Transit operates bus, light rail, and ferry services throughout the Hampton Roads region. The City of Norfolk Division of Transportation is responsible for the safety and efficiency of traffic flow involving vehicular traffic, vehicular parking, and bicycle and pedestrian safety (City of Norfolk, 2022).

Existing roadway capacity to accommodate vehicle use is typically described in terms of average daily traffic (ADT) volume.

### 3.3.2 Affected Environment

The affected environment is the transportation network serving NAVSTA Norfolk. NAVSTA Norfolk is located within a regional area known as the Navy Triangle Influence Area (NTIA). The NTIA is located within Norfolk and is bounded approximately by the Willoughby Bay to the north, Terminal Boulevard to the south, the James River and Elizabeth River to the west, and I-64 to the east.

The transportation network serving the area consists of interstate and local street systems, which include I-64, I-564, Terminal Boulevard, Hampton Boulevard, 1st View Street, West Bay Avenue, Granby Street, and Admiral Taussig Boulevard. These transportation facilities are also shared with other major local, state, and regional partners such as the Virginia Port Authority, the City of Norfolk, and Old Dominion University.

NAVSTA Norfolk is one of the major employment centers in the south side of the Hampton Roads region, consisting of the cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach. The majority of commuters to NAVSTA Norfolk come from the surrounding cities of Virginia Beach, Norfolk, and Chesapeake. Of those, most come from Virginia Beach or Chesapeake via I-64 and I-564. All routes to NAVSTA Norfolk experience travel delays during peak hours, including bridge and tunnel crossings for a portion of commuters coming from Hampton, Newport News, Poquoson, Suffolk, and other points on the north side of Hampton Roads. According to VDOT 2022 traffic data, I-564 has a north and southbound ADT of 32,717 between the Intermodal Connector and Admiral Taussig Boulevard (VDOT, 2024). The segment of Bay Avenue (the road on which Gate 4 is located) from I-64 to 1st View Street has an ADT of 12,488 (VDOT, 2024).

The regional roadway network, including access routes through Norfolk to NAVSTA Norfolk, experiences a high level of commuter traffic congestion. Traffic congestion is also experienced on base. However, at present, the existing level of service (LOS) for intersections and traffic conditions in the Proposed Action area is LOS A or LOS B (ClarkNexsen, 2022). The LOS designation is a professional industry standard used to describe the operating conditions of a roadway segment or intersection. The LOS is defined on a scale of A to F that describes the range of operating conditions on a particular type of roadway facility. LOS A through LOS B indicates free flow travel.

NAVSTA Norfolk contains seven military gate facilities. Secured gates providing access to NAVSTA Norfolk include Gates 1, 2, 3A, 4, 5, 6, and 22. Gate 5 serves as the truck gate and services all non-military commercial and industrial vehicles entering NAVSTA Norfolk. Gate 22 primarily provides access to traffic destined to the Air Terminal and Chambers Field as well as the primary access point for heavy vehicles; however, connectivity to the rest of NAVSTA Norfolk is possible from this gate. The operations of these gates often vary based on the level of security threats, available security personnel, and traffic incidents that occur inside or outside the facility. Peak hours for traffic at NAVSTA Norfolk gates are 5:15 a.m. to 6:15 a.m. and 3:00 p.m. to 4:00 p.m. (NAVFAC, 2014).

Alternatives to privately owned vehicles (POVs) at NAVSTA Norfolk include ridesharing (i.e., carpool, vanpool) or mass transit to, from, and within the NTIA. Transit service is provided by Hampton Roads Transit. There are six bus routes serving NAVSTA Norfolk.

### 3.3.3 Environmental Consequences

Effects to ground traffic and transportation are analyzed by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic.

#### 3.3.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to transportation infrastructure related to the Stingray CBUAS mission. Therefore, no significant effects would occur with implementation of the No Action Alternative.

#### Transportation Potential Effects:

- No significant effects to off-installation traffic.
- Construction traffic would be temporary.
- Operational traffic would result in small increases in gate traffic (less than 5 percent).

#### 3.3.3.2 Proposed Action Potential Effects

##### Construction Traffic Activity

During the construction period, there would be a short-term increase in trucks traveling to and from NAVSTA Norfolk to deliver construction materials Monday through Friday. There would be periods of increased truck trips followed by periods of decreased truck trips, depending on the work that is scheduled. Trucks would primarily access the sites from Gate 22. Deliveries would likely occur throughout the workday, and not all occur during peak traffic hours.

There would also be construction workers traveling to the site. A portion of the construction workers would be expected to carpool; however, construction worker vehicle trips could be added to the daily weekday commuter trips to and from NAVSTA Norfolk over the phased construction period from FY 2026 through FY 2029. This would lead to a short-term traffic increase.

The additional truck and other construction vehicle traffic would be temporary and minor and would not be expected to affect the current LOS on Hampton Roads area and NAVSTA Norfolk roadways, and the LOS would not be expected to change while construction is occurring. Therefore, the temporary and minor increase in construction vehicles with implementation of the Proposed Action would not result in significant effects to transportation.

##### Stingray CBUAS Personnel Commuting Activity

Approximately 600 Stingray CBUAS personnel, each accompanied by an average of 1.1 family members, would be added to the base population at NAVSTA Norfolk under the Proposed Action (DoD, 2023a). Because the availability of on-base housing is limited, most new personnel and their families would not live on base and would likely take up residence throughout the Hampton Roads area.

Therefore, for the purposes of this analysis, it is assumed that Stingray CBUAS personnel would commute to the installation daily in POVs. Preliminary project planning assumes that 40 percent of personnel would be deployed, on leave, on temporary assigned duty, reporting to off-base locations, or using alternative transportation (e.g., bicycle, carpool) and, therefore, would not commute in a POV. Thus, the remaining 60 percent (360) would commute in a POV on a typical day and require a parking space.



Assuming two trips per day (one in the morning and one in the evening) for each of the 360 commuters, the estimated additional traffic on an average day resulting from the Proposed Action would be 720 average daily trips. There is the potential for at least two and possibly three shifts to operate once fully manned. With the addition of a third shift, the number of daily trips would remain the same; however, the timing of the trips would be different and would likely reduce the effects as the trips would be spread out throughout the day and not concentrated during peak hours. This additional traffic would represent a minor increase in ADT on area roads. Utilizing assumptions from the traffic study commissioned to analyze on-installation traffic effects of the Proposed Action, around 75 percent of commuters would utilize Gate 4 for daily commutes, and the remainder would utilize other NAVSTA Norfolk gates (ClarkNexsen, 2022). This would result in a 4.5 percent increase in the annual ADT traveling on Bay Avenue (Gate 4) and an approximate 0.3 percent increase in the annual ADT traveling on I-564 between the Intermodal Connector and Admiral Taussig Boulevard. These minor increases, along with the dispersed nature of routes to the gates, would not be expected to have a significant effect on roadway LOS. Because the Proposed Action would result in an overall minor increase in ADT on area roads that occur in phases over a period of five years and because the personnel would operate in shifts, reducing peak hour effects, implementation of the Proposed Action would not result in significant effects to transportation.

### **3.4 Air Quality**

This discussion of air quality includes criteria pollutants, hazardous air pollutants (HAPs), standards, sources, permitting, and greenhouse gases (GHGs). Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and quantity of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses, aircraft) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents).

#### **3.4.1 Regulatory Setting**

##### **3.4.1.1 Criteria Pollutants and National Ambient Air Quality Standards**

The Clean Air Act (CAA) is the primary federal statute governing the control of air quality. The CAA designates six pollutants as "criteria pollutants" for which the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. The criteria pollutants are carbon monoxide, sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM<sub>10</sub>), fine particulate matter less than or equal to 2.5 microns in diameter (PM<sub>2.5</sub>), and lead. CO, SO<sub>2</sub>, NO<sub>2</sub>, lead, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone and some NO<sub>2</sub> and particulates are formed through atmospheric chemical reactions from other pollutant emissions (called precursors) that are influenced by weather, ultraviolet light, and other atmospheric processes.

NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards are designed to protect public welfare, such as prevent damage to farm crops, vegetation, and buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

The Virginia Department of Environmental Quality (VDEQ) State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution, Title 5 Virginia Administrative Code section 5-30, *Ambient Air Quality Standards*, provide details regarding ambient air quality standards in consideration of public health, safety, and welfare in the Commonwealth of Virginia. The VDEQ has adopted the NAAQS for purposes of regulating air quality in Virginia (VDEQ, 2024b).

Areas in compliance with the NAAQS are designated as attainment areas. Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant. Areas that have transitioned from nonattainment to attainment are designated as “maintenance areas” and are also required to adhere to maintenance plans to ensure continued attainment. Areas that have not been formally classified are unclassified or unclassifiable and are considered to be in attainment.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan for each nonattainment or maintenance pollutant (including the pollutant’s precursor) to achieve (nonattainment) or maintain (maintenance) compliance with the appropriate NAAQS for that pollutant. These plans, known as State Implementation Plans, are developed by state and local air quality management agencies and submitted to USEPA for approval.

In addition to the NAAQS for criteria pollutants, national standards exist for HAPs, which are regulated under section 112(b) of the 1990 CAA Amendments. HAPs (such as benzene and formaldehyde) are compounds known or suspected to cause cancer or other serious health and environmental effects. Unlike criteria pollutants, there are no NAAQS for HAPs. The *National Emission Standards for Hazardous Air Pollutants* regulate HAP emissions from stationary sources (40 CFR part 61). USEPA also promulgated a Mobile Source Air Toxics Rule to regulate HAPs from mobile sources. Mobile sources operating as a result of the Proposed Action (e.g., aircraft, construction equipment, and commuter vehicles) would be functioning intermittently over a relatively large area and would produce negligible ambient HAPs. In addition, USEPA regulations would cause overall mobile source emissions to decline substantially over the next several decades. Using a 2020 baseline, modeling results project that even with a 31 percent increase in vehicle miles traveled, there would be a combined 76 percent annual emissions rate reduction for priority mobile source air toxics (FHWA, 2023). For these reasons, HAPs are not further evaluated in the analysis.

#### 3.4.1.2 General Conformity

The USEPA General Conformity Rule (40 CFR part 93 Subpart B) applies to federal actions occurring in nonattainment or maintenance areas when its total direct and indirect emissions of nonattainment or maintenance pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity determination are called *de minimis* levels. *De minimis* levels (in short tons [tons] per year [tpy]) vary by pollutant and depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation to assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result due to implementation of the federal action within a nonattainment or maintenance area. If the results of the applicability analysis indicate that annual emissions would not exceed the *de minimis* level, then the conformity evaluation process is completed. If the annual emissions from an action equal or exceed a *de minimis* level, then a General Conformity determination would be required before the action could generate such emissions.



USEPA established NAAQS for ozone in 1997, 2008, and 2015. USEPA revoked the 1997 8-hour ozone NAAQS in 2015 and issued regulations specifying that states were no longer responsible for developing and submitting maintenance plans for current and former 1997 8-hour ozone NAAQS nonattainment areas (Federal Register Volume 80, p. 12264, March 6, 2015). The U.S. Court of Appeals for the District of Columbia Circuit issued the decision, *South Coast Air Quality Management District v. EPA*, 882 F.3d 1138 (District of Columbia Circuit 2018), where the court held that USEPA could not waive the 1997 8-hour ozone NAAQS nonattainment or maintenance plan requirements with respect to orphan nonattainment and maintenance areas, even though the 1997 standard had been revoked. USEPA subsequently issued guidance on Transportation Conformity applicability to these orphan nonattainment and maintenance areas. No guidance has been issued with regard to General Conformity, but the guidance on Transportation Conformity is assumed to be consistent for General Conformity requirements (USEPA, 2018).

#### **3.4.1.3 Air Permitting**

The CAA established the New Source Review (NSR) permitting programs for stationary air pollution sources. A permit is required when a stationary source has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specified thresholds. NSR is a preconstruction permitting program and includes major and minor source permitting. Major NSR includes the Prevention of Significant Deterioration permitting program for construction of major stationary sources located in NAAQS attainment areas. Minor NSR (generally for sources less than 100 tpy of a pollutant) applies to construction projects that do not necessitate major source permitting. The NSR process ensures that proposed emissions would conform to the State Implementation Plan. Additional permitting requirements may apply to increases in stationary source GHG emissions for sources that already trigger NSR for criteria pollutant emissions. The Title V program is an operating permit program applicable to all major air pollution sources and a limited number of minor sources. The VDEQ administers the permitting program for stationary sources in Virginia. This program requires permits for subject equipment that emit or control air contaminants prior to their construction, installation, or operation.

#### **3.4.1.4 Greenhouse Gases**

GHGs are gases that trap heat in the earth's atmosphere, specifically: carbon dioxide, methane, nitrous oxide, and fluorinated gases. These gases are released through the burning of fossil fuels, agricultural practices, the natural decay of organic waste, and industrial processes.

To account for heat-trapping potentials, GHG emissions are reported as a carbon dioxide equivalent (CO<sub>2</sub>e) and commonly expressed in units of metric tons.

#### **3.4.2 Affected Environment**

The affected environment is the Hampton Roads Intrastate Air Quality Control Region (AQCR), which includes the counties of Isle of Wight, James City, Southampton, and York and independent cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. The Air Division of the VDEQ is responsible for implementing and enforcing state and federal air quality regulations in Virginia.

USEPA classifies the Hampton Roads Intrastate AQCR as in attainment for all NAAQS (USEPA, 2024b), but it is designated as an orphan maintenance area for the 1997 8-hour ozone standard as a result of the *South Coast Air Quality Management District v. EPA*, 882 F.3d 1138 (District of Columbia Circuit 2018) decision. The conformity *de minimis* levels that are applicable to this region are presented in Table 3-4.

**Table 3-4 General Conformity *De Minimis* Levels Applicable to Ozone Maintenance Areas**

<i>Pollutant</i>	<i>Area Type</i>	<i>tpy</i>
Ozone (NO <sub>x</sub> )	All maintenance areas	100
Ozone (VOCs)	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100

Source: (USEPA, 2024a)

Notes: NO<sub>x</sub> = nitrogen oxides; tpy = tons per year; VOC = volatile organic compound

The most recent emissions inventory for the Hampton Roads Intrastate AQCR is shown in Table 3-5. Volatile organic compound (VOC) and nitrogen oxides (NO<sub>x</sub>) emissions are used to represent ozone generation because they are precursors of ozone. CO<sub>2</sub>e represents the CO<sub>2</sub> equivalent emissions. Air monitoring conducted in Norfolk over the past five years recorded no unhealthy air days for sensitive groups (USEPA, 2025a).

Mobile sources of air pollutants at NAVSTA Norfolk include aircraft, vessels, ground service equipment and vehicles, and private and government vehicles. For stationary sources, the facility is a Title V major source of VOC, CO, NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>, and HAPs emissions and it is regulated under a site-wide Title V operating permit (Number [No.] TRO-60941). Processes include but are not limited to external combustion units (boilers for steam heat and industrial use); internal combustion engines (e.g., natural gas and diesel emergency generators); surface coating operations for maintenance of marine vessels, aircraft, and facilities; abrasive blasting related to marine vessels and aircraft maintenance; and woodworking shops for facility maintenance, packing, and shipping.

**Table 3-5 City of Norfolk and Hampton Roads Intrastate Air Quality Control Region  
Annual Air Emissions Inventory (Year 2020)**

<i>Source Category</i>	<i>Air Pollutant Emissions (tons per year)</i>						
	<i>CO</i>	<i>NO<sub>x</sub></i>	<i>PM<sub>10</sub></i>	<i>PM<sub>2.5</sub></i>	<i>SO<sub>2</sub></i>	<i>VOCs</i>	<i>CO<sub>2</sub>e (t)</i>
Norfolk	17,942	4,276	1,719	817	151	4,932	1,202,384
<b>Total AQCR Emissions</b>	<b>151,205</b>	<b>27,335</b>	<b>18,833</b>	<b>8,491</b>	<b>1,698</b>	<b>76,165</b>	<b>10,117,806</b>

Source: (USEPA, 2024c)

Notes: AQCR = Air Quality Control Region; CO = carbon monoxide; CO<sub>2</sub>e = carbon dioxide equivalent; t = metric tons; NO<sub>x</sub> = nitrogen oxides; PM<sub>2.5</sub> = particulate matter less than or equal to 2.5 microns in diameter; PM<sub>10</sub> = particulate matter less than or equal to 10 microns in diameter; SO<sub>2</sub> = sulfur dioxide; VOCs = volatile organic compounds

### 3.4.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. The region of influence (ROI) for assessing air quality effects is the air basin in which the project is located in Norfolk, in the Hampton Roads Intrastate AQCR. The analysis considered NEPA effects related to criteria pollutant emissions and GHG emissions. This section also includes a conformity applicability analysis. Appendix A, *Air Quality Methodology and Calculations*, presents details of the inputs and calculation methods used in the air quality analyses.

#### Air Quality Potential Effects:

- No significant effects to air quality.
- Proposed Action: Air emissions would be minimal or *de minimis*; a Record of Non-Applicability is provided in Appendix A, *Air Quality Methodology and Calculations*.

#### 3.4.3.1 Conformity Applicability Analysis

In the case of criteria pollutants for which the project region does not attain or is in maintenance of a NAAQS, the analysis compared the net increase in annual emissions from the Proposed Action to the applicable pollutant conformity *de minimis* threshold. For the Hampton Roads Intrastate AQCR, the applicable conformity *de minimis* thresholds are 100 tpy of VOCs and NO<sub>x</sub>, as shown in Table 3-5. If the net increase in emissions from the Proposed Action do not exceed a *de minimis* threshold, then the action would be exempt from any further requirements under the General Conformity Rule. If the net change in emissions from the Proposed Action equals or exceeds a *de minimis* threshold, then a General Conformity determination would be required before the action could generate such emissions.

#### 3.4.3.2 NEPA Air Quality Analysis

##### Criteria Pollutants

In the case of criteria pollutants for which the ROI is in attainment of a NAAQS, the NEPA air quality analysis considered the potential for such emissions to contribute to an exceedance of a NAAQS. The analysis took into consideration the strength of project emission sources, their frequency of occurrence, and their spatial distribution. If the analysis determined that proposed emissions would not contribute to an exceedance of a NAAQS, then effects would be less than significant.

##### Greenhouse Gases

Determining the significance of GHG emissions requires careful consideration of their context, as there are no universally accepted thresholds. While the potential effects of GHG emissions are global and cumulative in nature, it is essential to assess the specific circumstances of each emission source. Factors such as the magnitude of emissions relative to global totals, the feasibility of mitigation measures, and the environmental and social vulnerabilities of the affected region (Virginia and the project region in this case) should be considered. Given that emissions from Stingray CBUAS operations constitute a very small fraction of both U.S. and global GHG inventories, it is reasonable to conclude that any measurable impact would be unlikely.

#### 3.4.3.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline air quality. Therefore, no significant effects to air quality or air resources would occur with implementation of the No Action Alternative.

#### 3.4.3.4 Proposed Action Potential Effects

The air quality effects analysis quantified potential emissions that would be released from the construction and operational activities associated with the Proposed Action. The analysis quantified, to the extent possible, annual emissions from the various project components that would occur during each calendar year. Construction emissions were estimated using the Air Conformity Applicability Model (ACAM) version 5.0.23a developed for the Air Force Civil Engineer Center (Solutio Environmental, Inc., 2022). ACAM is a tool for estimating criteria pollutant and GHG emissions for construction and operational activities.

##### Criteria Pollutants

Aircraft criteria pollutant emissions were analyzed for operations occurring below 3,000 feet AGL. Air pollutants emitted more than 3,000 feet AGL are considered by USEPA to be above the default atmospheric mixing layer and therefore would not appreciably affect ground-level air quality (USEPA,

1992). However, the atmospheric mixing layer is not applicable to GHG emissions. GHGs were analyzed based on all aircraft operations, regardless of altitude. MQ-25A aircraft would operate below 3,000 feet AGL during landing and takeoff cycles. E-2D aircraft would operate below 3,000 feet AGL during landing, takeoff, and pattern cycles, similar to touch-and-go operations. Air pollution modeling inputs and results are presented in Appendix A, *Air Quality Methodology and Calculations*.

Proposed facility construction and renovation would occur between approximately FY 2026 and FY 2029 and occupancy of the facilities by aircraft and personnel would occur between FY 2031 and FY 2035. Therefore, proposed construction and operational activities would not occur in the same calendar year.

The analysis did not quantify HAP emissions, as proposed activities would involve primarily mobile sources operating on an intermittent basis, and in the case of aircraft, over the airshed surrounding NAVSTA Norfolk. Emissions associated with construction would be both intermittent and temporary. Aircraft operations from the Proposed Action represent a small percentage of the total flight activity around the installation and accordingly would represent a small amount of the total HAPs generated on an intermittent basis at NAVSTA Norfolk. The Proposed Action would not result in changes that would result in a meaningful increase in HAPs. For these reasons, potential HAPs emissions were not evaluated in the air quality analysis.

### Conformity Applicability Analysis

Table 3-6 presents estimates of annual conformity-related emissions that would occur from the Proposed Action. Years 2026 through 2030 would occur from construction activities. Aircraft and personnel operations would begin in year 2031 and would reach a steady state in year 2034. The main source of emissions would occur from the usage of aircraft ground support equipment. The data in Table 3-6 show that annual emissions would be below the conformity *de minimis* thresholds of 100 tpy for both VOCs and NO<sub>x</sub>. Therefore, the Proposed Action would be exempt from the requirements of the General Conformity Regulation. A General Conformity Record of Non-Applicability has been completed and can be found in Appendix A, *Air Quality Methodology and Calculations*, along with associated air quality calculations and documentation indicating that the VOCs and NO<sub>x</sub> emissions would not have a significant effect on air quality in Norfolk and the Hampton Roads Intrastate AQCR.

**Table 3-6 Annual Conformity-Related Emissions for the MQ-25A Action (tpy)**

<i>Year</i>	<i>VOCs</i>	<i>NO<sub>x</sub></i>
2026	0.17	1.48
2027	0.53	1.31
2028	0.43	0.82
2029	0.02	0.54
2030	0.02	0.54
2031	0.22	0.61
2032	0.41	0.67
2033	0.60	0.72
2034	3.07	39.34
<b>Conformity Thresholds</b>	<b>100</b>	<b>100</b>
<b>Exceed Threshold</b>	<b>No</b>	<b>No</b>

Notes: NO<sub>x</sub> = nitrogen oxides; tpy =tons per year; VOCs = volatile organic compounds

## NEPA Air Quality Analysis

**Construction Activities.** Estimates of annual air pollutant emissions that would occur from construction activities under the Proposed Action are presented in Table 3-7. These data show that proposed construction would produce minor amounts of annual emissions. The emission estimates include a control efficiency of 50 percent for fugitive dust emissions due to the implementation of best management practices (BMPs) for dust control, such as the following:

- Use water trucks to keep areas of vehicle movement damp enough to minimize the generation of fugitive dust.
- Minimize the amount of disturbed ground area at a given time.
- Limit the speed of grading and earth-moving equipment to 15 miles per hour or less on unpaved surfaces.
- Suspend all soil disturbance activities when winds exceed 25 miles per hour or when visible dust plumes emanate from the site and stabilize all disturbed areas with water application.
- Designate personnel to monitor the dust control program and to increase watering, as necessary, to minimize the generation of dust.

Due to the intermittent nature of construction emission sources and their relatively low strengths, combined construction emissions would result in ambient effects that would not contribute to an exceedance of a NAAQS. As a result, air quality effects from construction of the Proposed Action would not be significant.

**Table 3-7 Estimated Annual Air Pollutant Emissions from Construction Activities Under the Proposed Action**

Year	Air Pollutant Emissions (tpy) <sup>1</sup>					
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	VOCs
2026	1.82	1.48	6.83	0.06	0.003	0.17
2027	1.72	1.31	0.04	0.04	0.003	0.53
2028	0.38	0.28	0.01	0.01	0.001	0.41

Notes: CO = carbon monoxide; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter less than or equal to 10 microns in diameter; PM<sub>2.5</sub> = particulate matter less than or equal to 2.5 microns in diameter; SO<sub>x</sub> = sulfur oxides; tpy = tons per year; VOCs = volatile organic compounds  
VOCs and NO<sub>x</sub> are precursors to the formation of ozone.

<sup>1</sup> Emissions were estimated using Air Conformity Applicability Model 5.0.23a (Air Force Civil Engineer Center, 2022)

**Operational Activities.** Potential Stingray CBUAS maintenance operations, such as the use of paints and solvents for routine maintenance (amounts not known at this time) as well as other facility operations (e.g., emergency generators, facility heating, etc.), would be analyzed to confirm that the Navy has the emissions or use already accounted for under the NAVSTA Norfolk Title V Air Permit or the Navy would apply for and obtain a modification to the Title V Air Permit prior to performing those actions. The Navy would adhere to the permit requirements while conducting Stingray CBUAS maintenance and facilities operations. Because the permit sets limits on emissions (via various control methods) that are protective of the environment, Stingray CBUAS maintenance activities and facilities operations would not result in significant effects to air quality.

Stingray CBUAS flight operations and personnel would increase in phases over a period of a few years to the maximum anticipated annual operations in year 2034. Table 3-8 presents estimated annual air pollutant emissions from Stingray CBUAS for the steady-state condition in year 2034 due to 960 Stingray

CBUAS operations, 2,880 E-2D operations, and commuting emissions from the approximately 600 additional personnel. Annual operations from the Proposed Action after year 2034 would result in the same amount of emissions as those presented in Table 3-8.

**Table 3-8 Estimated Peak Annual Air Pollutant Emissions from Operations Under the Proposed Action (Steady State)**

Component	Air Pollutant Emissions (tons per year) <sup>1</sup>					
	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	VOCs
Aircraft Operations	5.91	12.91	0.28	0.28	1.24	0.40
GSE Emissions	8.17	25.65	0.77	0.75	0.45	1.86
Emergency Diesel Generators	0.15	0.54	0.02	0.02	0.01	0.02
Commuter Vehicles	9.49	0.23	0.02	0.02	0.01	0.79
<b>Total Annual Emissions</b>	<b>23.72</b>	<b>39.34</b>	<b>1.09</b>	<b>1.07</b>	<b>1.70</b>	<b>3.07</b>

Notes: CBUAS = Carrier-Based Unmanned Aircraft System; CO = carbon monoxide; GSE = ground support equipment; NO<sub>x</sub> = nitrogen oxides; PM<sub>10</sub> = particulate matter less than or equal to 10 microns in diameter; PM<sub>2.5</sub> = particulate matter less than or equal to 2.5 microns in diameter; SO<sub>x</sub> = sulfur oxides; VOCs = volatile organic compounds  
VOCs and NO<sub>x</sub> are precursors to the formation of ozone.

<sup>1</sup> Values equate to year 2034 operations; future annual operations would result in the same amount of emissions.

Air emission sources from operation of the Proposed Action would occur intermittently over the larger NAVSTA Norfolk airfield and adjoining airspace below 3,000 feet AGL. This pattern of activity would substantially disperse operational emissions to the point that they would result in ambient effects that would not contribute to an exceedance of a NAAQS. As a result, air quality effects from operation of the Proposed Action would not be significant.

The Navy has determined that the potential emissions of the Proposed Action would not cause or contribute to a violation of any NAAQS or State Ambient Air Quality Standards. Emissions would be below the applicable General Conformity *de minimis* thresholds. The General Conformity Record of Non-Applicability is provided in Appendix A, *Air Quality Methodology and Calculations*, of this EA.

### Greenhouse Gases

Table 3-9 presents estimates of annual GHG emissions that would occur from construction and operation of the Proposed Action for each calendar year of activity. Annual operations from the Proposed Action after year 2034 would result in the same amount of emissions as those presented in Table 3-9 for year 2034. These emissions represent a negligible 0.0006 percent of recent U.S. GHG annual emissions (over 6.3 billion metric tons) (USEPA, 2024d). The main source of GHG emissions would occur from proposed aircraft operations. While the increase in GHG emissions from the Proposed Action is measurable, it represents an extremely small fraction of the overall national and global emissions.

**Table 3-9 Estimated GHG Emissions from Construction and Operation of the Stingray CBUAS Proposed Action**

Year/Component	Annual CO <sub>2</sub> e Emissions (t)
2026 – Construction	297
2027 – Construction	300
2028 – Construction	90
2029 – Emergency Generators	27
2030 – Emergency Generators	27

**Table 3-9 Estimated GHG Emissions from Construction and Operation of the Stingray CBUAS Proposed Action**

<i>Year/Component</i>	<i>Annual CO<sub>2</sub>e Emissions (t)</i>
2031 – Personnel/Emergency Generators	2,000
2032 – Personnel/Emergency Generators	2,273
2033 – Personnel/Emergency Generators	2,542
2034 – All Operations <sup>1</sup>	28,977

Notes: CBUAS = Carrier-Based Unmanned Aircraft System; CO<sub>2</sub>e = carbon dioxide equivalent; GHG = greenhouse gas; t = metric tons

<sup>1</sup> Value equates to year 2034 operations; future annual operations would result in the same amount of emissions.

### 3.5 Water Resources

This discussion of water resources addresses groundwater, wetlands, and floodplains. This section does not address surface water, shorelines, or marine waters because none of these categories of water resources occur at the project site or would be affected by the Proposed Action.

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition. Sole source aquifer designation provides limited protection of groundwater resources that serve as drinking water supplies.

Wetlands are a subset of all “Waters of the United States” and defined by USEPA and U.S. Army Corps of Engineers as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include “swamps, marshes, bogs and similar areas.”

Floodplains are areas of low-level ground along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and often support a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year floodplain (an area that has a 1 percent chance of flooding in any one year) and 500-year floodplain (moderate flood hazard areas with a 0.2 percent annual chance of flooding). Floodplain delineation maps are produced by the Federal Emergency Management Agency and provide a basis for comparing the locale of the Proposed Action to the floodplains.

#### 3.5.1 Regulatory Setting

USEPA regulates groundwater quality and quantity under several statutes and regulations, including the Safe Drinking Water Act.

Wetlands are regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. EO 11990, *Protection of Wetlands*, requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse effects associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

EO 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse effects associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain.

The Coastal Zone Management Act (CZMA) of 1972 aids states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Actions occurring within the coastal zone commonly have several resource areas that may be relevant to the CZMA. The relevance of the CZMA to the Proposed Action is addressed in Chapter 5, *Other Considerations Required by the National Environmental Policy Act*.

### **3.5.2 Affected Environment**

The following describes existing conditions for water resources at the project site.

#### **3.5.2.1 Groundwater**

Groundwater resources underlying NAVSTA Norfolk are present in the Columbia (surficial) aquifer and the Yorktown-Eastover aquifer (McFarland & Bruce, 2006; Smith & Harlow, Jr., 2002). The Columbia aquifer is generally 4 to 4.5 feet below ground surface, but depths vary seasonally and during drought cycles. The Columbia aquifer is tidally influenced and discharges to Mason Creek, the Elizabeth River, and Willoughby Bay (ATSDR, 2002). The Yorktown-Eastover aquifer is several hundred feet below ground surface. This feature is wedge shaped, ranging from 100 to 200 feet thick inland to 240 to 280 feet thick at the eastern shoreline of Virginia Beach (McFarland & Bruce, 2006; Smith & Harlow, Jr., 2002). The Yorktown confining zone occurs between the surficial Columbia aquifer and the underlying Yorktown-Eastover aquifer across most of the coastal plain and locally restricts but does not prevent groundwater exchange between the two surficial aquifers. These units of the surficial aquifer systems are underlain by the St. Mary's confining unit (Smith & Harlow, Jr., 2002).

Groundwater recharge in the area occurs mainly through precipitation infiltrating to the Columbia aquifer. Recharge of this surficial aquifer is limited due to a shallow layer of clayey (impermeable) soil. Urban development, including paved surfaces, drains and drainage ditches, and stormwater sewers, also inhibits groundwater recharge in the developed areas of Norfolk (Smith & Harlow, Jr., 2002). Concerns about declining groundwater levels as a result of groundwater withdrawals in southeastern Virginia have led to the region, including Norfolk, being designated as a groundwater management area by the Commonwealth of Virginia.

Water quality in the Columbia aquifer is poor, and groundwater is not used at NAVSTA Norfolk for water consumption, agricultural irrigation, or industrial applications (NAVFAC, 2007).

#### **3.5.2.2 Wetlands**

There are approximately 100 acres of delineated wetlands at NAVSTA Norfolk (NAVFAC, 2007), mostly within vegetated areas adjacent to the runway and taxiways at Chambers Field, along Mason Creek, and in isolated areas on the shoreline of Willoughby Bay (Figure 3-5). No wetlands occur within the LP48 and LP48A construction footprint. However, a freshwater emergent wetland is adjacent to the GBDAA/LSTAR tower site. This wetland is highly modified as the vegetation is controlled (routinely mowed) in accordance with airfield requirements to discourage use by wildlife around the airfield. These wetlands are on federal lands, regulated under Section 404 of the Clean Water Act, and subject to the enforceable policies contained within the Chesapeake Bay Act as part of the approved Virginia Coastal Zone Management Program.



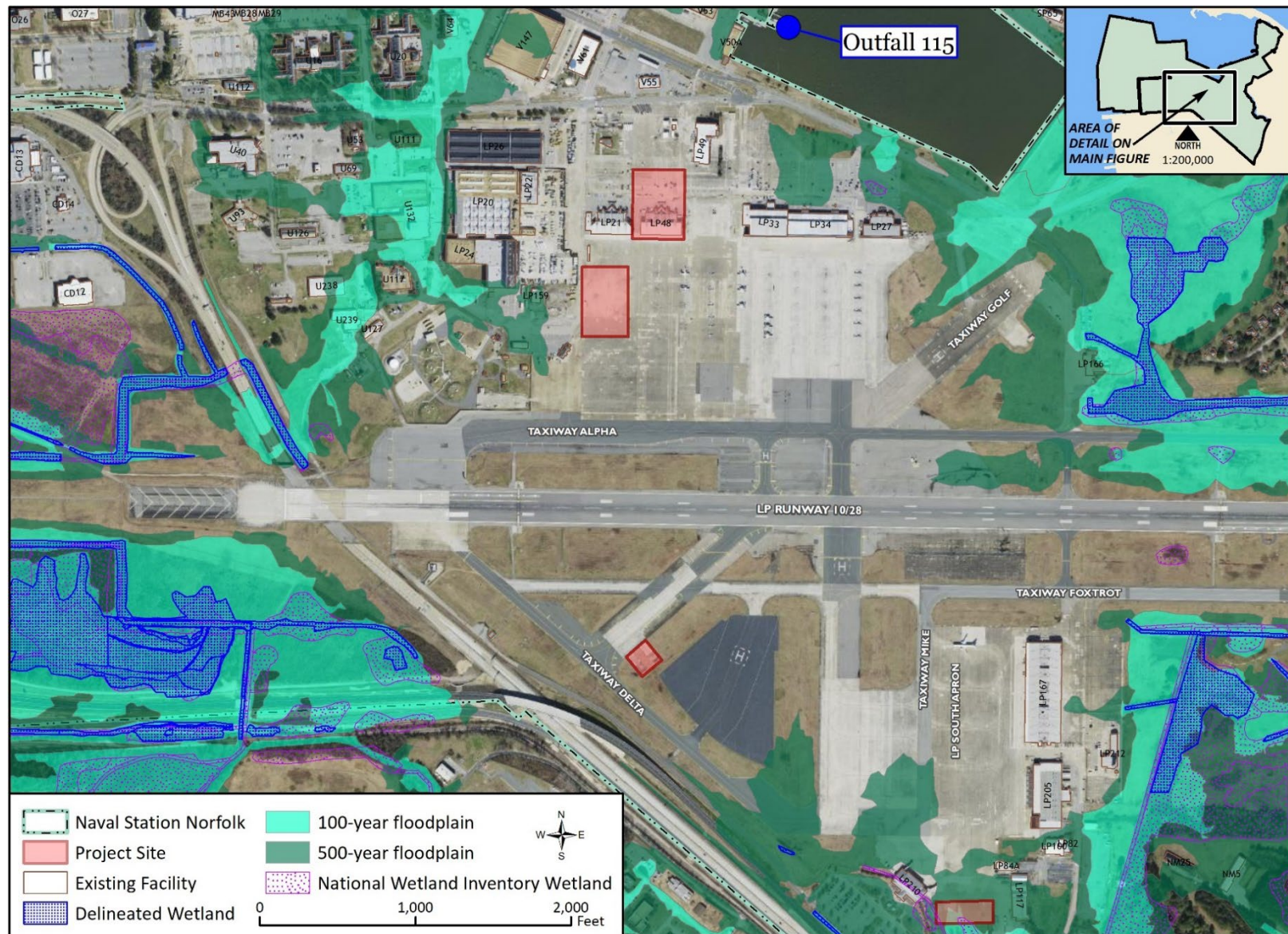


Figure 3-5 Wetlands and Floodplains of NAVSTA Norfolk

### 3.5.2.3 Floodplains

Although portions of NAVSTA Norfolk are within the 100-year and 500-year floodplains (Figure 3-5), the listed elevation of the Chambers Field airfield is 14.8 feet mean sea level (MSL), which is above the 100-year floodplain elevation at 8.5 feet MSL (CH2M Hill, 2005). The site of the proposed GBDAA/LSTAR tower is within the 500-year floodplain and an adjacent area that would be trenched for utility routing to the GBDAA/LSTAR tower is within the 100-year floodplain (Figure 3-5).

### 3.5.3 Environmental Consequences

The analysis of environmental consequences of the Proposed Action on water resources considers potential effects to groundwater, wetlands, and floodplains. Groundwater analysis focuses on the potential for effects to the quality, quantity, and accessibility of the water. The assessment of wetlands considers the potential for changes to the local hydrology, soils, or vegetation that support wetlands. The analysis of floodplains considers whether any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters.

#### 3.5.3.1 No Action Alternative Potential Effects

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline water resources. Therefore, no effects to water resources would occur with implementation of the No Action Alternative.

#### 3.5.3.2 Proposed Action Potential Effects

The study area for the analysis of effects to water resources associated with the Proposed Action includes the Chambers Field area within NAVSTA Norfolk.

The Proposed Action would include construction of a two-story support facility; installation of a GBDAA/LSTAR tower; renovation of an existing hangar; repairs to the existing power check pad, and modifications to the west aircraft wash rack at Chambers Field. Except for the proposed GBDAA/LSTAR tower site, all construction elements would occur on developed land with impervious surfaces.

#### Groundwater

Construction and operation of the Proposed Action would not require extraction or consumption of groundwater from the project site. However, due to the relatively shallow depth of groundwater, it is possible that construction activities requiring excavation or scraping of soils, such as trenching for the underground utilities supplying the tower, could encounter groundwater and it would require temporary dewatering to facilitate construction. If the groundwater is uncontaminated, it may be

#### Water Resources Potential Effects:

- No significant effects to water resources.
- Potential encounter with groundwater during construction would require dewatering. Construction contractor will comply with applicable wastewater disposal requirements.
- Direct and indirect impacts to wetlands adjacent to proposed project site would be avoided through compliance with stormwater permit, Stormwater Pollution Prevention Plan, and implementing applicable structural and non-structural BMPs.
- The Proposed Action would not construct new structures in a floodplain or increase risks of flooding on- or off-site.

discharged as an authorized non-stormwater discharge under the Virginia Stormwater Management Program Construction General Permit as long as it has been filtered, settled, or similarly treated. If contaminated groundwater is encountered during construction, it would be containerized and disposed of in accordance with applicable procedures.

Major portions of NAVSTA Norfolk are covered with impervious surfaces. For the portion of NAVSTA Norfolk that drains via outfall 115 to Willoughby Bay (see Figure 3-5), nearly 80 percent is covered with impervious surfaces. The Proposed Action would not add any additional impervious surfaces to this drainage area other than a pad and driveway for the GBDAA/LSTAR tower, which would add a negligible area of impervious surfaces overall to NAVSTA Norfolk. Further, the Proposed Action would install stormwater management improvements, consisting of manufactured water quality treatment devices, along with low impact development features in accordance with the Unified Facilities Criteria (DoD, 2023b) and compliance with the Energy Independence and Security Act (EISA). Therefore, the Proposed Action would not adversely affect onsite groundwater recharge. Construction activities under the Proposed Action would comply with the National Pollutant Discharge Elimination System Construction General Permit that would require non-numeric erosion and sediment controls and pollution prevention measures. Compliance with the permit would ensure that construction activities would not release chemical contaminants to groundwater and, therefore, would not affect the quality of groundwater resources at the project site.

### **Wetlands**

None of the Proposed Action elements would be located within a wetland area, although trenching through the tip of the modified wetland adjacent to the GBDAA/LSTAR site would be required to route underground utilities to the tower. The areal extent of trenching for the utilities within the wetland would be less than 0.5 acres and the construction activities would be covered by a general wetland (Clean Water Act Sections 401/404) permit if necessary. Once the utilities have been installed, the trench would be backfilled, and the area regraded as appropriate. As noted in Section 3.5.2.2, *Wetlands*, the wetland is highly modified as the vegetation is controlled (mowed) in accordance with airfield requirements.

The construction contractor would be required to implement erosion and sediment controls and pollution prevention measures in compliance with the Construction General Permit and with the enforceable policies within the Chesapeake Bay Act (9 Virginia Administrative Code 25-830-130) and Virginia's Erosion and Sediment Control Law. Thus, the disturbance to the wetland would be temporary and would not result in permanent changes to hydrology or loss of habitat value.

Project operations would not encroach or otherwise affect existing wetlands. Erosion control measures could include erosion control blankets, soil stabilizers, silt fencing, sandbags, and storm drain inlet protection devices. Applicable BMPs would be included in the preliminary engineering design and construction of facilities. By implementing BMPs and other control measures, operations associated with the Proposed Action would not adversely affect wetlands adjacent to the project area.

### **Floodplains**

With the exception of the underground utilities supplying the GBDAA/LSTAR tower, none of the new construction, renovation, or repairs associated with the Proposed Action would be within the mapped 100-year floodplain. The GBDAA/LSTAR tower and the driveway to the tower would be located within the 500-year floodplain; however, the tower structure would be installed on the top of a pad that would be 4 feet above the existing grade, and the elevation of the top of the pad would be 11 feet MSL in

accordance with UFC 3-201-01 (DoD, 2022). The underground utilities connecting to the tower would cross the 100-year floodplain, but it would be buried and not vulnerable to flooding. The driveway to the tower would not alter flood risks. Therefore, the Proposed Action would not construct any structures in a floodplain that would alter the probability of flood inundation or present a risk to personnel or structures.

Therefore, implementation of the Proposed Action would not result in significant effects to water resources.

### 3.6 Biological Resources

Biological resources include plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support plants and wildlife.

Within this EA, biological resources are divided into three categories: (1) terrestrial vegetation, (2) terrestrial wildlife, and (3) special status species. Offshore Navy UAS testing, training, and certification activities have been analyzed in the 2018 *Final Atlantic Fleet Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement* (refer to Section 1.6, *Key Documents*) and future operation will be analyzed in subsequent *Atlantic Fleet Training and Testing Environmental Impact Statements/Overseas Environmental Impact Statements*, which are executed on a seven-year cycle. Therefore, the potential effects of Stingray CBUAS operations to marine biological resources are not evaluated in this EA. Marine species are not anticipated to be affected by Proposed Action construction because all construction would occur on land and water quality BMPs required by applicable permits (see Section 2.5, *Best Management Practices Included in the Proposed Action*, as well as measures listed in Table 3-13 in Section 3.8, *Summary of Potential Effects to Resources and Effect Avoidance and Minimization*) would be implemented during and after construction to prevent effects (e.g., siltation from erosion, spills, etc.) to the marine biological resources in the vicinity of NAVSTA Norfolk.

#### 3.6.1 Regulatory Setting

Special status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act (ESA) and species afforded federal protection under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the USFWS or National Marine Fisheries Service to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan (INRMP) has been developed that, as determined by the Department of Interior or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

Birds, both migratory and most native -resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186, *Migratory Bird Conservation*. Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take,



capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. The final rule authorizing the DoD to take migratory birds in such cases includes a requirement that the Armed Forces must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the Proposed Action if the action would have a significant negative effect on the sustainability of a population of a migratory bird species.

Bald and golden eagles are protected by the BGEPA. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles, including their parts, nests, or eggs. The act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.”

### 3.6.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under biological resources at NAVSTA Norfolk. Threatened and endangered species are discussed in Section 3.6.2.3, *Special Status Species*, with a composite list applicable to the Proposed Action provided in Table 3-10.

**Table 3-10 Threatened and Endangered Species Known to Occur or Potentially Occurring in the ROI and Critical Habitat Present in the Study Area**

<i>Common Name</i>	<i>Scientific Name</i>	<i>Federal Listing Status</i>	<i>State Listing Status</i>	<i>Critical Habitat Present?</i>
Piping plover	<i>Charadrius melodus</i>	FT	ST	No
Monarch butterfly	<i>Danaus plexippus</i>	P	NL	No
Tricolored bat	<i>Perimyotis subflavus</i>	P	SE	No
Northern long-eared bat	<i>Myotis septentrionalis</i>	FE	ST	No

Sources: (VDWR, 2022a; USFWS, 2024)

Notes: C = candidate species for federal ESA listing; ESA = Endangered Species Act; FE = federal endangered; FT = federal threatened; NL = not listed; P = proposed for ESA listing; ROI = region of influence; SE = state endangered; ST = state threatened

#### 3.6.2.1 Terrestrial Vegetation

The majority of the land area at NAVSTA Norfolk is intensely developed, with very little open space that remains in natural condition. Most areas are improved, dominated by turf grasses (such as airfields, Clear Zones, buildings, and associated urban areas), and recreational/open areas (such as maintained landscaped lawns, mowed fields, created wetlands, and recreational fields) (NAVFAC, 2022). Sporadic patches of forested communities, unmanaged scrub-shrub, and wetland communities are present, but outside of the project area (NAVFAC, 2022).

The Proposed Action would occur on land in a developed area mainly devoid of natural habitat areas or plant communities (Figure 2-1). Therefore, aquatic species and terrestrial vegetation are not discussed further in this EA.

#### 3.6.2.2 Terrestrial Wildlife

Terrestrial wildlife includes all terrestrial animal species (i.e., insects and other invertebrates, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest importance or interest.

Since NAVSTA Norfolk is extensively developed and built largely on fill, there are very few contiguous natural areas, resulting in a limited diversity of wildlife that are either highly mobile or highly adaptable to urban environments. Terrestrial mammals recorded at NAVSTA Norfolk include red fox (*Vulpes vulpes*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), Virginia opossum (*Didelphis virginianus virginiana*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), and muskrat (*Ondatra zibethicus*). Small mammals include the southeastern shrew (*Sorex longirostris longirostris*), eastern mole (*Scalopus aquaticus*), Norway rat (*Rattus norvegicus*), and several species of mice including the house mouse (*Mus musculus*) and white-footed mouse (*Peromyscus leucopus*) (NAVFAC, 2022). Mammal surveys conducted between January 2022 and December 2022 as part of a Wildlife Hazard Assessment confirmed the presence of grey fox, coyote, and raccoon (USDA, 2023).

Bat surveys in the summer and fall of 2015 recorded calls suggesting the eastern red bat (*Lasiurus borealis*), silver haired bat (*Lasionycteris noctivagans*), and tricolored bat (*Perimyotis subflavus*) are present at NAVSTA Norfolk. The tricolored bat is a Virginia state endangered species and is proposed for listing as an endangered species under the ESA (Federal Register Volume 87, No. 177, pp. 56381 – 56393, 2022). Only one big brown bat (*Eptesicus fuscus*) call was recorded during a spring 2015 survey (NAVFAC, 2022). The northern long-eared bat was federally listed as endangered in March of 2023. Northern long-eared bats have not been confirmed at NAVSTA Norfolk; and the nearest recorded roosting habitat is over 16 miles away.

NAVSTA Norfolk is located on the Atlantic flyway and is in proximity to the confluence of major watersheds, including the James River, Elizabeth River, and Chesapeake Bay. Shorelines on NAVSTA Norfolk and tidal marshes and wetlands that surround the installation attract a variety of bird species. Seventy-four bird species were observed during Wildlife Hazard Assessment surveys conducted between January 2022 and December 2022 (USDA, 2023). The most abundant species included European starling (*Sturnus vulgaris*), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaidura macroura carolinensis*), ring-billed gull (*Larus delawarensis*), laughing gull (*Leucophaeus atricilla*), eastern meadowlark (*Sturnella magna*), Canada goose (*Branta canadensis*), herring gull (*Larus argentatus*), double-crested cormorant (*Phalacrocorax auritus*), and ruddy duck (*Oxyura jamaicensis*). Other bird species that have been observed on NAVSTA Norfolk include the great black-backed gull (*Larus marinus*), yellow-crowned night-heron (*Nyctanassa violacea*), black skimmer (*Rynchops niger*), pied-billed grebe (*Podilymbus podiceps*), turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius sparverius*), red-tailed hawk (*Buteo jamaicensis*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), sharp-shinned hawk (*Accipiter striatus*), killdeer (*Charadrius vociferus*), northern flicker (*Colaptes auratus*), fish crow (*Corvus ossifragus*), and American robin (*Turdus migratorius*) (NAVFAC, 2022; USDA, 2023).

The active runways at NAVSTA Norfolk and the large number of birds that use the surrounding watersheds as a migratory stopover increase the dangers for aviation operations and wildlife aircraft strikes, particularly to bird species. NAVSTA Norfolk operates under a BASH Management Plan that provides guidance to minimize wildlife hazards on and around the airfield that pose a threat to aviation safety. The plan addresses procedures for effectively minimizing and communicating hazardous wildlife activity, reporting wildlife/aircraft strikes, collecting and identifying wildlife/aircraft strike remains, and improving awareness of the potential hazards to naval aviation due to wildlife (NAVSTA Norfolk, 2020a). NAVSTA Norfolk holds two depredation permits from the U.S. Fish and Wildlife Service (USFWS) (MBPER0022222, Migratory Birds Depredation at Airports, and MB72329C-0, Eagle Depredation) to cover these activities. Table 3-11 provides the number of wildlife strike incidents recorded at NAVSTA Norfolk between CY 2013 and CY 2022, which equates to an average of 31 strikes per year. The table also provides the number of aircraft movements each year and shows the relative infrequency of BASH

incidents presented as the number of strikes per 10,000 aircraft movements. Refer to Section 3.1, *Public Health and Safety*, for additional details on BASH incidents at NAVSTA Norfolk.

**Table 3-11 NAVSTA Norfolk Wildlife Strike Incidents (Calendar Years 2012–2022)**

<i>Year</i>	<i>Number of Strikes</i>	<i>Number of AM</i>	<i>Number of Strikes per 10,000 AM</i>
2013	45	73,772	6.1
2014	22	64,302	3.42
2015	25	53,945	4.63
2016	34	46,739	7.27
2017	17	53,881	3.16
2018	26	52,916	4.91
2019	38	57,363	6.62
2020	41	74,264	5.52
2021	22	55,511	3.96
2022	40	57,026	7.01
<b>10-Year Average</b>	<b>31</b>	<b>58,972</b>	<b>5.26</b>

Source: (USDA, 2023)

Notes: AM = aircraft movements; NAVSTA = Naval Station

Wetlands and associated scrub-shrub woodland communities may support amphibians and reptiles at NAVSTA Norfolk. Species that may potentially occur include greater siren (*Siren lacertina*), spotted salamander (*Ambystoma maculatum*), bullfrog (*Rana catesbeiana*), stinkpot turtle (*Sternotherus odoratus*), northern fence lizard (*Sceloporus undulatus hyacinthinus*), and eastern garter snake (*Thamnophis sirtalis sirtalis*) (NAVFAC, 2022).

### 3.6.2.3 Special Status Species

A USFWS Information for Planning and Consultation (IPaC) resource list was obtained on November 6, 2024, that identifies federally listed species that have the potential to occur on NAVSTA Norfolk (USFWS, 2022a). Additionally, on September 14, 2022, the USFWS issued a proposed rule to list the tricolored bat as an endangered species under the ESA (Federal Register Volume 87, No. 177, pp. 56381 – 56393, 2022). On January 26, 2023, the USFWS issued a final rule to list the northern long-eared bat as an endangered species under the ESA (Federal Register Volume 88, No. 17 pp. 4908 – 4910, 2023). Based on the IPaC list, the INRMP, Virginia Department of Wildlife Resources information, and USFWS’s proposed rule, federally listed species known to occur or have the potential to occur at NAVSTA Norfolk are listed in Table 3-10.

The piping plover primarily occurs along the shoreline of barrier beaches and sandspits. Since the late 1990s, all breeding activity in Virginia has occurred on the Eastern Shore’s barrier islands (VDWR, 2022b). While piping plovers are known to occur in the region, no occurrences have been recorded at NAVSTA Norfolk (NAVFAC, 2022), and there is no suitable habitat for piping plover within the project area. Designated critical habitat for piping plover is located outside of NAVSTA Norfolk. Accordingly, the Navy determines the Proposed Action would have no effect on the piping plover.

There are two North American migratory populations of monarch butterfly, located east and west of the Rocky Mountains (USFWS, 2020). Monarch butterflies associated with the eastern migratory population have the potential to occur in the project area; however, there are no records of occurrence at NAVSTA Norfolk (NAVFAC, 2022).

The tricolored bat is one of the smallest bats native to North America. The once-common species is wide ranging across the eastern and central United States and portions of southern Canada, Mexico, and

Central America. During the winter, tricolored bats are found in caves and mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves (USFWS, 2022b). Acoustic surveys conducted at NAVSTA Norfolk in the fall of 2015 suggest the presence of tricolored bats on the installation (NAVFAC, 2022).

The northern long-eared bat is a medium sized bat roughly 3 to 3.7 inches in length with a wingspan of 9 to 10 inches. The species is wide ranging across 37 states and 8 provinces in North America. Northern long-eared bats overwinter in caves or mines and spend the remainder of the year in forested habitats roosting, foraging, and swarming habitat with appropriate conditions for maternity colony members (USFWS, 2022c). Occurrence of the northern long-eared bat at NAVTA Norfolk has not been confirmed. The USFWS IPaC excludes this species in the ROI (USFWS, 2024); and acoustic surveys conducted at NAVSTA Norfolk in the fall of 2015 did not document northern long-eared bat calls on the installation.

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are both federally protected under the BGEPA. Golden eagles have not been observed at NAVSTA Norfolk; however, bald eagles have been documented (NAVFAC, 2022; USDA, 2023). Based on a review of the Virginia Bald Eagle Nest Locator in the Center for Conservation Biology's online mapping portal, there are three bald eagle nests that occur in the vicinity of NAVSTA Norfolk (Figure 3-6). Nest NO1001 (last recorded as occupied in 2020) is located 1.6 miles away from LP South Apron. Nest NO2001 (last recorded as occupied in 2021) is located about 3 miles away from the LP South Apron. Nest PM2001 (last recorded as occupied in 2021) is on the northern shoreline of Craney Island and is 4.4 miles away from Taxiway Alpha (Center for Conservation Biology, 2023). In October 2020, an E-2C struck a bald eagle on approach a half mile from Runway 10/28, which resulted in an emergency landing and damage to the aircraft. This strike represents the second eagle strike at NAVSTA Norfolk (USDA, 2023) since FY 2012. NAVSTA Norfolk currently holds a Federal Eagle Depredation Permit (Permit No. MB72329C-0), which is maintained by the NAVSTA Norfolk Natural Resource Program. Under this permit, NAVSTA Norfolk is authorized to use non-lethal scare devices, scare tactics, or frightening devices to move or disperse bald eagles endangering human safety due to a high risk of a serious bird strike to landing and departing aircraft. The permit does not authorize the killing, injury, or capture of any eagle, the destruction of any young or nests, nor the disturbance of eagles at active nests. NAVSTA Norfolk is also required to notify the USFWS within 48 hours of any injury or death of a bald eagle during activities.

A study that tracked bald eagle movements around nests along the shores of the Chesapeake Bay found that the majority of eagle movements during nesting, and immediately following fledging by both adults and juveniles, occurred within a 1-mile distance from the nest (Miller et al., 2019). The study also suggests that fledglings from nests in lower-quality habitat make longer movements away from the nest and may pose a greater risk to aircraft compared to fledglings from a nest in a higher-quality habitat. A review of bald eagle strike data from 1990 to 2013 from the U.S. Air Force Bird Strike Database and the Navy Web Enabled Safety System found that an average of eight bald eagle strikes were reported annually, with the majority of strikes (approximately 83 percent) occurring at or below 1,000 feet AGL associated with takeoffs, climbouts, final approaches, landings on or over the airfield (Washburn et al., 2015). This study also noted an increased frequency of bald eagle strikes during the most recent decade of the study period and attributed the increase to the exponential growth of bald eagle populations in the continental United States during the same time period.





Source: (Center for Conservation Biology, 2023)

**Figure 3-6** Bald Eagle Nests in the Vicinity of NAVSTA Norfolk

At least nine species of USFWS Birds of Conservation Concern have been recorded at NAVSTA Norfolk (USFWS, 2021; NAVFAC, 2022; USDA, 2023). Species designated as Birds of Conservation Concern that have the potential to occur in the project area, either for foraging or as a transient include, but are not limited to, black skimmer, least tern (*Sternula antillarum*), gull-billed tern (*Gelochelidon nilotica*), semipalmated sandpiper (*Calidris pusilla*), American oystercatcher (*Haematopus palliatus*), chimney swift (*Chaetura pelagica*), lesser yellowlegs (*Tringa flavipes*), yellow-breasted chat (*Icteria virens virens*), and prairie warbler (*Setophaga discolor*). A list of bird species observed at NAVSTA Norfolk is found in the INRMP (NAVFAC, 2022) and in the *Annual Report for the Wildlife Hazard Mitigation for Naval Station Norfolk*, January 2022 – December 2022 (USDA, 2023).

Birds, both migratory and most native-resident bird species, occurring at NAVSTA Norfolk are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186, *Migratory Bird Conservation*. As previously stated, NAVSTA Norfolk currently holds a Federal Migratory Bird Depredation Permit (Permit No. MBPER0022222), which is maintained by the NAVSTA Norfolk Natural Resource Program.

### 3.6.3 Environmental Consequences

This section presents an analysis of potential direct, indirect, temporary, and permanent effects to biological resources that could result from implementation of the Proposed Action. Personnel changes associated with the Proposed Action would not affect biological resources on NAVSTA Norfolk. Therefore, the biological resources analysis focuses on potential effects from facility and infrastructure requirements and air vehicle operations.

Direct effects are the immediate result of project-related activities (e.g., direct mortality or disturbance of species, or removal of vegetation and habitat during construction). Direct effects may be either temporary (reversible) or permanent (irreversible).

Indirect effects are caused by or result from project-related activities but occur later in time or are spatially removed from the activities (e.g., shifts in vegetation composition or increased predation risk over time). Indirect effects are diffuse, resource-specific, and less amenable to quantification or mapping than direct effects, but still need to be considered. Indirect effects typically extend beyond the immediate project footprint(s).

Potential project effects are described as temporary or permanent based on their anticipated longevity. Project effects are evaluated based upon an understanding of project configuration and components, and methods and equipment that would be used.

#### Biological Resource Potential Effects:

- No significant effects to vegetation, wildlife, or special status species including migratory birds and bald eagles.
- The Proposed Action may affect but is not likely to adversely affect the proposed endangered tricolored bat. No effect to other listed species.

#### 3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to biological resources. Therefore, no significant effects to biological resources would occur with implementation of the No Action Alternative.

### 3.6.3.2 Proposed Action Potential Effects

The study area for the analysis of effects to biological resources associated with the Proposed Action includes the Proposed Action project areas, adjacent habitats that may be exposed to noise and visual effects during construction and operations, and any downstream habitats that have the potential to be affected by erosion, runoff, or sedimentation

#### Terrestrial Vegetation

The Proposed Action would occur in a developed area mainly devoid of natural habitat areas or plant communities. Therefore, no effects to vegetation would be expected as a result of construction and operations under the Proposed Action.

Construction equipment has the potential to introduce and spread invasive non-native plant species outside of the project area. Therefore, all vehicles, equipment, and footwear would be cleaned of dirt, debris, seeds, mud, and visible plant material prior to being brought onto and before leaving the project area. Vehicles would also be cleaned after construction prior to being used elsewhere on NAVSTA Norfolk. Any weeds removed would be placed in bags or dumpsters and hauled away. Adherence to these measures would prevent the introduction and spread of invasive non-native plant species and effects to terrestrial vegetation. BMPs required by applicable permits (see Section 2.5, *Best Management Practices Included in the Proposed Action*, as well as measures listed in Table 3-13 in Section 3.8, *Summary of Potential Effects to Resources and Effect Avoidance and Minimization*) would be implemented during and after construction to prevent effects (e.g., sedimentation from erosion, spills, etc.) to downstream habitats.

#### Terrestrial Wildlife

The project area for the Proposed Action is located within a developed area at NAVSTA Norfolk that provides little to no habitat for most wildlife species. Ground-disturbing activities within the project area during construction would not occur in any sensitive habitat areas or natural plant communities, and wildlife habitats would not be removed.

Some common wildlife species (e.g., eastern cottontails, raccoons, and various bird species) occur in developed portions of the installation and could occur in the project area. Potential effects to common terrestrial wildlife could result from construction and aircraft noise. Not all species have been studied for their behavioral or physiological responses to noise; however, logical inferences can be made from the findings of species-specific studies to similar species as is done in this analysis. Noise associated with construction activities can affect birds and other wildlife in multiple ways, including altered vocal behavior to mitigate masking, reduced abundance in noisy habitats, changes in vigilance and foraging behavior, and effects on individual fitness (Shannon et al., 2016). Noise resulting from the proposed construction would be localized, short term, and only during daylight hours. The project area is a developed military industrial land subject to frequent elevated noise and activity levels. If present, common wildlife in the areas proposed for construction and near the airfield are already exposed to elevated noise under baseline conditions. Studies have also shown that various bird species can habituate to noise following frequent exposure and cease to respond behaviorally to the noise (Larkin et al., 1996; National Park Service, 1994; Plumpton, 2006). However, the likelihood of habituation depends on a number of factors, including the bird species (Bowles et al., 1991) and the frequency of and proximity to exposure. Whereas chronic exposure to acoustic disturbance may compromise the general health and reproductive success of some birds (Kight et al., 2012), a physiological stress response is not necessarily indicative of negative consequences to individual birds or to populations due to aforementioned factors (Larkin et al., 1996; National Park Service, 1994; Butler et al., 2009). Indirect

effects from construction noise are expected to be minor because the ambient noise levels within the vicinity are elevated under existing conditions (e.g., aircraft operations and hazing methods) and would be unlikely to substantially increase from the relatively minor and temporary nature of the proposed construction activities. The temporary addition of localized construction noise and activity would not further reduce the suitability of the project area for common wildlife.

The Proposed Action would add 960 annual Stingray CBUAS flight operations and 2,880 chase aircraft operations to NAVSTA Norfolk (an average of 10.5 operations per day). This would represent a 6 percent total increase to airfield operations (refer to Section 3.1, *Public Health and Safety*). When compared with existing aircraft, the Stingray CBUAS would be quieter than other aircraft types operating at NAVSTA Norfolk. Noise under the Proposed Action would slightly increase by 0.3 dB DNL or less over baseline conditions (Section 3.2, *Noise*). Effects to wildlife from aircraft noise and visual stressors can include a startle reflex that induces running or flight, increased expenditure of energy, decreased time and energy spent on life functions such as feeding and mating, increased likelihood of predation, and interruption of breeding or nursing behavior (Efroymson et al., 2000; Larkin et al., 1996). Aircraft noise may also cause masking of auditory signals within exposed faunal communities (Barber et al., 2009). Researchers have documented a range of bird behavioral responses to aircraft noise, including no response, head turn, alert behavior, startle response, flying or swimming away, diving into the water, and increased vocalizations (Brown et al., 1999; Larkin et al., 1996; National Park Service, 1994; Plumpton, 2006; Pytte et al., 2003; Stalmaster & Kaiser, 1997). Some behavioral responses may be accompanied by physiological responses, such as increased activation of the neural and endocrine systems, causing changes such as increased blood pressure, available glucose, and blood levels of hormones (Manci et al., 1988; Partecke et al., 2006). Research suggests it is possible that birds could habituate to repeated aircraft noise and cease to exhibit behavioral responses after a period of time (Conomy et al., 1998; Larkin et al., 1996; National Park Service, 1994; Plumpton, 2006). The potential noise increase from aircraft operations under the Proposed Action is minimal compared to current levels and would not result in a significant change in noise over baseline conditions. Therefore, construction and aircraft noise under the Proposed Action would not result in significant effects to wildlife.

Stingray CBUAS flight operations may increase the potential for BASH occurrences, due to the increase in airfield operations. Based on data gathered between 1981 and 2022, the most frequently struck species at NAVSTA Norfolk include various species of gulls and terns, mourning doves, and unidentifiable bats. Mammal species struck at NAVSTA Norfolk include bats, red fox, and coyote, accounting for 5 percent of reported strikes during the same time period (USDA, 2023). It is anticipated that similar groups of wildlife would continue to be affected by flight operations under the Proposed Action. However, a 6 percent increase in total annual airfield operations is not expected to cause a significant increase in BASH incidents. NAVSTA Norfolk maintains a BASH Management Plan to reduce the potential for collisions between aircraft and birds or other animals. The BASH Management Plan prescribes an ongoing process that involves the distribution of information and active and passive measures to control how birds use the critical areas around the airfield. Methods outlined in the plan to reduce BASH risks include habitat management (i.e., controlling grass height, eliminating bare areas, and removing dead vegetation to maintain the runway and adjacent areas in a manner least attractive to birds), bird dispersal (e.g., horns, sirens, and bird calls used to disperse birds from the airfield), and bird avoidance.

NAVSTA Norfolk holds a Federal Migratory Bird Depredation Permit (Permit No. MBPER0022222), which is maintained by the NAVSTA Norfolk Natural Resource Program and would implement actions within the scope of these permits to reduce BASH risk. The Navy has determined that the flight operations under the Proposed Action may result in the “take” of migratory birds. However, given the overall low numbers of BASH incidents compared to the number of existing aircraft operations (refer to Section 3.1,

*Public Health and Safety*), the proposed increase in aircraft operations would not result in take of migratory birds that would affect population levels. Additionally, the Proposed Action is a military readiness activity; therefore, “take” would be in compliance with the MBTA because continued implementation of the BASH Management Plan at NAVSTA Norfolk would reduce incidence of “take” resulting from flight operations to levels that would not have a significant negative effect on the sustainability of a population of a migratory bird species.

Therefore, no significant effects to birds or other wildlife from BASH is expected.

### Special Status Species

The Navy has determined that implementing the Proposed Action would have no effect on the northern long-eared bat, piping plover, or monarch butterfly because they have not been documented within the project area footprints. Based on results of acoustic monitoring, it is possible that the tricolored bat has the potential to occur within the project area footprint. However, the areas proposed for construction do not contain suitable habitat and tricolored bats would not be affected by construction activities.

Operations of the Proposed Action would not have a significant effect on the noise environment at NAVSTA Norfolk and, therefore, are not expected to result in adverse effects to tricolored bats (refer to Section 3.2, *Noise*). While other species of bats have been involved in BASH incidents at NAVSTA Norfolk, tricolored bat strikes have not been documented (USDA, 2023). Their potential occurrence is based on an acoustic recording captured in 2015, but the lack of occurrence in BASH incidents from 1981 through 2022 suggests a low potential for direct strikes during aircraft operations. Given their small size, bats represent a low BASH hazard overall (USDA, 2023). Therefore, the Navy determines the Proposed Action may affect, but is not likely to adversely affect, the tricolored bat.

As indicated in Section 3.6.2.3, *Special Status Species*, two bald eagles have been struck by aircraft at NAVSTA Norfolk since FY 2012, with the most recent incident occurring in October 2020. BASH incidents at NAVSTA Norfolk are considered to be relatively infrequent compared to the overall number of annual aircraft movements (refer to Section 3.1, *Public Health and Safety*). Additionally, NAVSTA Norfolk maintains a Federal Eagle Depredation Permit (Permit No. MB72329C-0).

Stingray CBUAS flight operations and accompanying chase aircraft would represent a 6 percent increase in total annual airfield operations over baseline conditions and would not significantly increase the risk of a bald eagle strike or result in additional takes of bald eagles from aircraft collisions. Given the low number of historical bald eagle strikes relative to the overall number of annual aircraft movements, bald eagle strikes are considered very rare events. NAVSTA Norfolk would continue to be managed in accordance with the installation’s BASH Management Plan and the installation’s Federal Eagle Depredation Permit. Both the BASH Management Plan and the Federal Eagle Depredation Permit provide measures that minimize the potential for bald eagle strikes during NAVSTA Norfolk operations. Projected noise from Stingray CBUAS and chase aircraft flight operations would be similar to existing aircraft operations at NAVSTA Norfolk, and likely less than hazing methods used to deter eagles from the airfield and runways, resulting in negligible noise effects to eagles. Therefore, the Proposed Action would not result in takes of bald eagle or golden eagle, as defined by the BGEPA.

In conclusion, implementation of the Proposed Action would not result in significant effects to biological resources.

## 3.7 Cultural Resources

This discussion of cultural resources includes consideration of effects to historic properties, architectural resources, archaeological resources, cultural items subject to the Native American Graves Protection and Repatriation Act, sacred sites, and other properties or items of cultural significance.

### 3.7.1 Regulatory Setting

Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990. Federal agencies' responsibility for protecting historic properties is defined primarily by Sections 106 and 110 of the NHPA. Section 106 requires federal agencies to consider the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be governed by state, local, and territorial laws.

### 3.7.2 Affected Environment

In compliance with the NHPA, the Navy consults with regulators, Tribal Nations and other interested parties to identify historic properties and other cultural resources that may be affected by the Proposed Action. Per the NHPA, historic properties are defined as any district, site, building, structure, or object listed on, or eligible for listing on, the National Register of Historic Places (NRHP). For the purposes of this analysis, historic properties can be divided into three major categories:

- Archaeological resources include the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these material remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties include properties associated with cultural practices and beliefs of a living community that are (a) rooted in the community's history and (b) important to maintaining the continuing cultural identity of the community (National Park Service, 1998).

A cultural resources survey was conducted to identify historical properties that are listed or potentially eligible for listing in the NRHP (Navy, 2013). There are no traditional cultural properties at NAVSTA Norfolk listed on the NRHP, and no known sites are considered potentially eligible for listing. Therefore, traditional cultural properties are not discussed further.

The Area of Potential Effects (APE) for cultural resources is “the geographic area or areas within which an undertaking (project, activity, program, or practice) may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.” The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, the Navy determined that the APE includes the project area (i.e., where facilities construction would occur) and its viewshed—determined to be one-half mile from Building LP48A and the GBDAA/LSTAR Tower.

Typically, the Navy would also consider the 65 dB DNL noise contour as defining the APE to evaluate the potential effects of the Proposed Action as it relates to cultural resources and historic properties, including architectural or built resources, archaeological resources, and American Indian resources.

Because there is no discernable change in aircraft noise contours (refer to Section 3.2, *Noise*) between the No Action Alternative and the action alternative, and only a 6 percent change in operational tempo at the airfield, any potential effects of the undertaking would be nearly identical to current conditions. Furthermore, the Navy is relying on previous consultations for the broader area under the 65 dB DNL noise contour. Therefore, the Navy focused its analysis on the effects of the Proposed Action related to

construction and renovation activities, and effects of noise, vibration, and aesthetics of those construction activities within the viewshed.

To facilitate management of cultural resources in accordance with the NHPA, the Navy has developed and implemented a regional Integrated Cultural Resources Management Plan (ICRMP) for the Hampton Roads facilities (Navy, 2013), including those addressed in this EA.

### **3.7.2.1 Archaeological Resources**

There have been 12 reports or letters generated between 1990 and 2014: eight Phase 1 archaeological surveys, one predictive model and resource assessment of NAVSTA Norfolk, two Phase 1a assessments (one of which was subsequently incorporated into the predictive modeling report), and one letter detailing monitoring that occurred on the installation. Five sites have been identified at NAVSTA Norfolk, one site has been determined potentially eligible for listing in the NRHP, and four sites have been determined not eligible by the Virginia State Historic Preservation Officer. Archaeological testing was conducted in the vicinity of the airfield in 1999. The testing revealed no intact cultural horizons, and no cultural artifacts were recovered. There are no known NRHP-eligible or NRHP-listed archaeological resources located within the proposed project sites (Navy, 2013).

### **3.7.2.2 Architectural Resources**

In 1998, the Navy prepared an intensive-level survey of architectural resources at NAVSTA Norfolk (Navy, 2016a). The survey was based on architectural resources studies conducted in the 1970s, 1980s, and 1990s. The purpose of the 1998 survey was to provide NRHP eligibility recommendations for 643 architectural resources built at NAVSTA Norfolk prior to 1947 and identified by the Navy in a preliminary architectural survey completed in 1996. These surveys resulted in the identification of three eligible districts at NAVSTA Norfolk: the Naval Administration/Recruit Training Station Historic District, the Naval Supply Depot Historic District, and the Naval Air Station Historic District (Navy, 2013). In addition, the Jamestown Exposition Site Historic District was listed in the NRHP in 1975. An additional survey was completed of resources constructed between 1948 and 1962 that have become 50 years old since the initial survey, and no additional potentially significant properties were identified.

#### **Former Naval Air Station Historic District**

The Naval Air Station Historic District was reevaluated in 2016 and was determined to lack integrity and a sufficient inventory of contributing resources representative of the airfield's historical development and important themes and, therefore, was no longer recommended as eligible for listing in the NRHP. This was due to various demolitions that have occurred since 1999, most notably the demolition of Building V52, which suffered a catastrophic fire that required its demolition. The Virginia Department of Historic Resources was notified regarding the proposed dissolution of the historic district (Navy, 2016b). However, with the dissolution of the historic district, the Navy still considers several properties on the former district as historic properties, including two individually eligible Buildings V88 (a large aircraft storehouse and shop building) and T26 (a main administration building), as well as buildings in the SP area. The buildings in the SP area, which consist of housing and facilities that were built to support the seaplane area at Breezy Point, will continue to be considered historic properties until further studies can be performed to determine if they are still eligible for recognition as a historic district and receive Virginia Department of Historic Resources concurrence on their final eligibility. Figure 3-7 depicts the remaining historic properties of the former Naval Air Station Historic District and the viewshed APE.



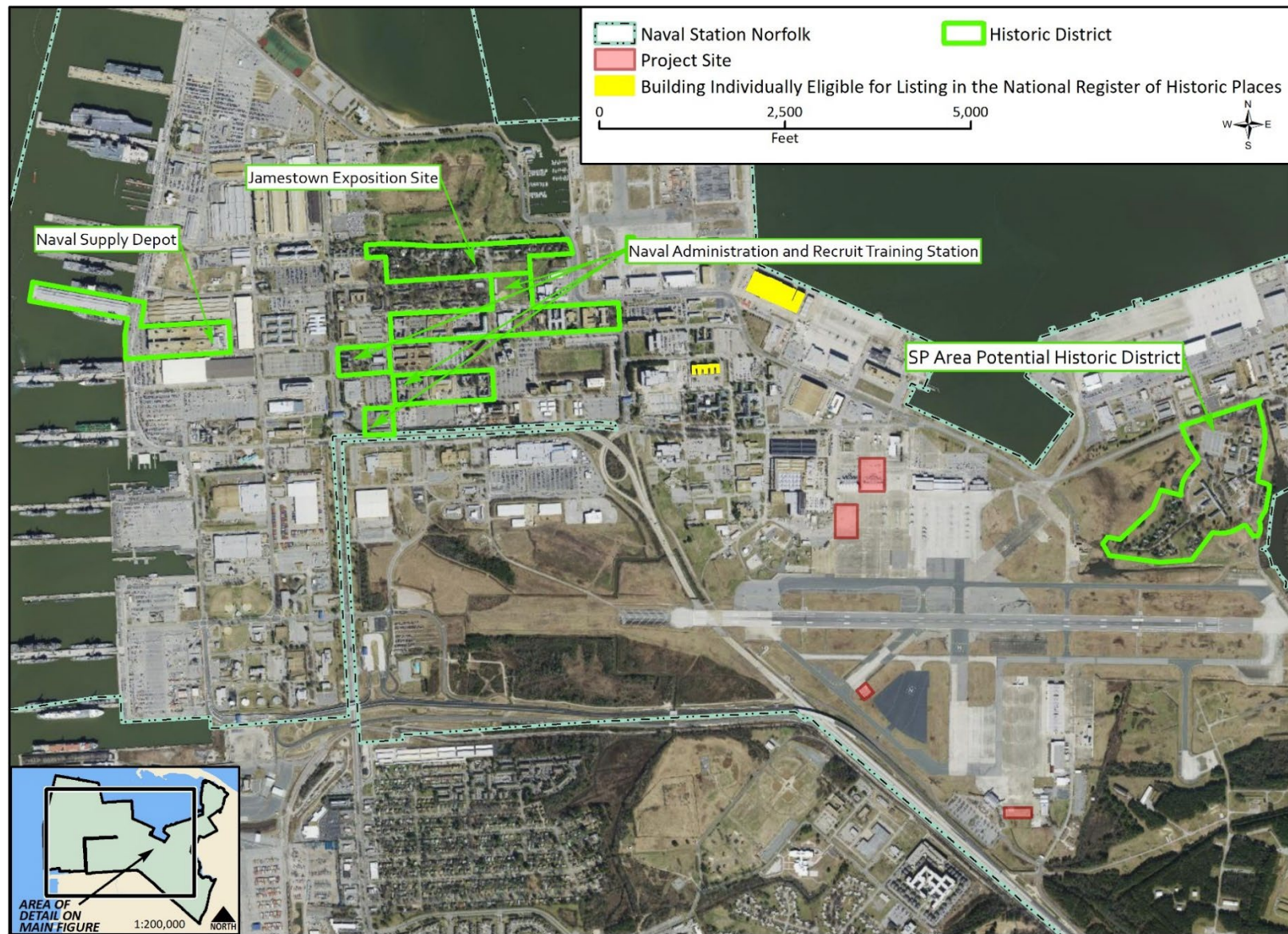


Figure 3-7 NAVSTA Norfolk Historic Properties



### **Naval Supply Depot Historic District**

The Naval Supply Depot Historic District is located in the northwest portion of NAVSTA Norfolk (Figure 3-7). The Naval Supply Depot Historic District was determined eligible under NRHP Criteria A and C, with a period of significance of 1941 to 1945. The district is associated with the evolution of naval supply functions and by World War II housed the Navy's largest supply depot. The district currently consists of a very large-scale warehouse (Warehouse W143) on its west side, and a pier with transit shed (Pier 8 and Transit Shed W4) on the east, with the two areas divided by Decatur Avenue (Navy, 2013).

### **Jamestown Exposition Site Historic District**

The Jamestown Exposition Site Historic District is located in the northwest portion of NAVSTA Norfolk (Figure 3-7). Listed in the NRHP in 1975, the Jamestown Exposition Site Historic District includes buildings constructed for the 1907 Jamestown Exposition, as well as other quarters and support buildings either acquired or built by the Navy when it established Naval Operating Base Norfolk in 1917 (Navy, 2013). All but three of the historic buildings (Buildings G29, M47, and M104) were transferred from the Navy to Mid-Atlantic Military Family Communities LLC in 2005 as part of a public-private venture project for family housing, and the Navy is no longer responsible for managing these facilities.

### **Naval Administration/Recruit Training Station Historic District**

The Naval Administration/Recruit Training Station Historic District is located in the northwest portion of NAVSTA Norfolk (Figure 3-7). Determined eligible under NRHP Criteria A and C with a period of significance of 1917 to 1946, the Naval Administration/Recruit Training Station Historic District is associated with the evolution of naval recruit training. The district represents the core area of administration, recruiting, training, and recreational activities and illustrates the characteristics of permanent military construction spanning the period of World War I through World War II. The district encompasses various building types, including administration and school buildings, barracks, mess hall, and recreation and personnel support buildings, of which 24 resources contribute to the NRHP eligibility of the historic district (Navy, 2013). The district overlies the site design created for the 1907 Jamestown Exposition and retains the original street grid and several important buildings in Block N (Buildings N21, N23, and N24) that are individually eligible for inclusion in the NRHP.

## **3.7.3 Environmental Consequences**

Analysis of potential effects to cultural resources is based on the following considerations: (1) physically altering, damaging, or destroying all or part of a resource, (2) altering characteristics of the surrounding environment that contribute to the importance of the resource, (3) introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or (4) neglecting the resource to the extent that it deteriorates or is destroyed. The potential to directly disturb historic properties can be assessed by identifying the type and location of the Proposed Action. Effects that are farther removed from the immediate project area, including visual, audible (noise), or atmospheric changes due to project implementation are harder to quantify.

### **3.7.3.1 No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur, and there would be no change to cultural resources. Therefore, no significant effects to cultural resources would occur with implementation of the No Action Alternative.

### 3.7.3.2 Proposed Action Potential Effects

#### Archaeological Resources

No adverse effects to archaeological resources are anticipated pending disturbance assessment results for the southernmost project element and consultation with the Virginia Department of Historic Resources. As described in Section 3.7.2.1, *Archaeological Resources*, there are no known NRHP-listed or NRHP-eligible archaeological resources within the areas where ground-disturbing activities would occur. Results of the disturbance assessment and consultation with the Virginia Department of Historic Resources will be provided in the Final EA. In the event that potentially eligible archaeological resources are identified, and it is determined that the Proposed Action would result in adverse effects, the Navy would consult with the Virginia Department of Historic Resources to resolve any adverse effects. Resolution of adverse effects can be achieved by:

- eliminating the adverse effect through redesign or relocation of the project
- reducing the adverse effect's severity through redesign of the project
- mitigating the adverse effect through documentation or data recovery
- accepting the adverse effect in the public interest

Once an agreement is reached on how adverse effects would be resolved the Navy and consulting parties would record the agreement in a Memorandum of Agreement. The Memorandum of Agreement is a legal document that spells out the measures agreed upon by the consulting parties, identifies who is responsible for carrying them out, and provides documentary evidence that the Navy has met the requirements of Section 106.

It is not expected that undiscovered cultural resources would be found during implementation of the Proposed Action; however, in the unlikely event of an inadvertent discovery of previously unrecorded or unevaluated cultural resources during ground-disturbing construction, the Navy would manage these resources in accordance with the NHPA and other federal and state laws, Navy and DoD regulations and instructions, and DoD American Indian and Alaska Native Policy by implementing ICRMP Standard Operating Procedure No. 12, Project Specific Standard Treatment of Archaeological Resources, which contains instructions for inadvertent discovery of archaeological materials and human remains.

This section will be updated in the Final EA on completion of disturbance assessment and consultation with the Virginia Department of Historic Resources.

#### Architectural Resources

No adverse effects to architectural resources are anticipated pending consultation with the Virginia Department of Historic Resources. The Proposed Action would not physically affect any of the architectural resources described in Section 3.7.2.2, *Architectural Resources*. No individual facilities or

#### Cultural Resources Potential Effects:

- No significant effects to cultural resources.
- No adverse effect to NRHP-eligible or NRHP-listed properties.
- There are no known NRHP-eligible archaeological resources within the Proposed Action Area.
- There are no traditional cultural properties at NAVSTA Norfolk that are listed in the NRHP and no known sites that are considered potentially eligible for listing.
- The proposed facilities would have no adverse visual effects on elements of the nearby former Naval Air Station Historic District or the more distant historic districts at NAVSTA Norfolk.

facilities in any of the historic districts would be modified or demolished, and no new facility construction would occur within any of their boundaries. Thus, there would be no effects to any NRHP-eligible or NRHP-listed architectural resources.

Portions of the former Naval Air Station Historic District may be within visual range of the Proposed Action's larger construction projects (Building LP48A, and GBDAA/LSTAR tower). A viewshed assessment conducted to determine potential visual effects on historic properties from the Proposed Action concluded that the Proposed Action would not diminish the integrity of location, setting, or feeling of any historic properties and would have no adverse effect. Additionally, construction of the GBDAA/LSTAR tower would not result in significant changes to the overall setting of historic properties as the tower would remain fairly consistent with the current setting and feeling of an operational airfield (Stantec, 2024). Because they are relatively small scale, interior renovations or ground-level alterations/repairs would not likely be visible or discernible from any historic property; therefore, there are no significant effects to these resources from these parts of the Proposed Action.

The other historic districts, while similar in distance to the Proposed Action project areas, would likely not be within visual range of the Proposed Action's larger construction projects. The Navy will coordinate with the Virginia Department of Historic Resources during the design process for the new buildings and renovations. By adhering to these design and construction considerations and standards and coordinating with Virginia Department of Historic Resources during the design process, the new facilities would potentially have no adverse effect on the nearby historic properties or the more distant historic districts at NAVSTA Norfolk.

No effects on the NRHP-eligible or NRHP-listed historic properties are expected to result from the noise associated with proposed Stingray CBUAS and chase aircraft annual airfield operations at NAVSTA Norfolk. Scientific studies of the effects of noise and vibration on historic properties have considered potential effects on historic buildings, prehistoric structures, water tanks, archaeological cave/shelter sites, and rock art. These studies have concluded that subsonic overflights were well below established damage thresholds (Sutherland, 1990; Sutherland et al., 1990; Committee on Hearing and Bio Acoustics, 1977). The Proposed Action would not noticeably alter the noise environment around NAVSTA Norfolk (see Section 3.2, *Noise*) and would not affect historic properties under the installation airspace.

No effects to the setting of the NRHP-eligible and NRHP-listed historic properties are expected to result from the proposed flight operations by Stingray CBUAS and chase aircraft at NAVSTA Norfolk. Annual flight operations for the Proposed Action would only increase operations by 6 percent over the No Action Alternative, and the Stingray CBUAS would operate very similarly to fixed-wing aircraft already based at NAVSTA Norfolk. Therefore, while Stingray CBUAS and chase aircraft operations may be audibly and/or visibly noticeable, the Proposed Action would not impair the integrity of the potentially affected resources such that they would no longer meet the NRHP criteria for listing.

This section will be updated upon completion of consultation with the Virginia Department of Historic Resources.

Therefore, facility construction under the Proposed Action would have no adverse effect to NRHP-eligible or NRHP-listed architectural resources. Furthermore, implementation of the Proposed Action would not result in adverse effects and would therefore not result in significant effects to cultural resources.

### **3.8 Summary of Potential Effects to Resources and Effect Avoidance and Minimization**

A summary of the potential effects associated with each of the action alternatives and the No Action Alternative is presented in Table 3-12 and effect avoidance and minimization measures are presented in Table 3-13.

**Table 3-12 Summary of Potential Effects to Resource Areas**

<b>Resource Area</b>	<b>No Action Alternative</b>	<b>Proposed Action</b>
Public Health and Safety	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to public health and safety.	No significant effects to public health and safety would occur under the Proposed Action. There would be an increase in mishap risk at the airfield proportionate to the increase in operations (2% for the Stingray CBUAS and 6% total increase overall when including chase aircraft); however, the risk would remain very low overall. The Proposed Action would not result in environmental health and safety risks that may disproportionately affect children. Stingray CBUAS would utilize existing flight paths over the cities of Norfolk and Virginia Beach to access offshore Special Use Airspace training areas.
Noise	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to noise.	No significant effects to noise would occur under the Proposed Action. Noise-sensitive points of interest and DNL noise contours at NAVSTA Norfolk would not be expected to experience a perceptible change from existing conditions due to Stingray CBUAS and chase aircraft operations.
Transportation	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to transportation.	No significant effects to transportation would occur under the Proposed Action. An estimated 720 additional average daily vehicle trips on access roads are anticipated, resulting in a 5% increase on Bay Avenue (between I-64 and 1st View Street) and a 0.4% increase on I-564 (between Terminal Boulevard and Admiral Taussig Boulevard).
Air Quality	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to air quality.	No significant effects to air quality would occur under the Proposed Action. Because air emissions would be minimal or <i>de minimis</i> ; the Proposed Action is exempt from General Conformity requirements. Due to the intermittent nature of Proposed Action emission sources (construction and aircraft operations) and their relatively low strengths, emissions would not result in an exceedance of a National Ambient Air Quality Standards. A Record of Non-Applicability is provided in Appendix A, <i>Air Quality Methodology and Calculations</i> .

**Table 3-12 Summary of Potential Effects to Resource Areas**

<b>Resource Area</b>	<b>No Action Alternative</b>	<b>Proposed Action</b>
Water Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to water resources.	No significant effects to water resources would occur under the Proposed Action. The Proposed Action would not affect the quality of groundwater resources at the project site. A small area of wetland adjacent to the GBDAA/LSTAR tower site would be affected temporarily during installation of underground utilities. Permits would be obtained prior to construction and permit conditions would be followed. Repairs to Taxiway Alpha would occur near wetlands; however, the repairs would be managed to avoid direct and indirect effects from runoff and sedimentation. Minor construction associated with installation of underground utilities connecting to the GBDAA/LSTAR tower would occur within a small portion of the 100-year floodplain; however, construction would not cause any upstream or downstream flooding issues and would not affect off-installation areas.
Biological Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no significant effects to biological resources.	No significant effects to vegetation, wildlife, or special status species would occur under the Proposed Action. With implementation of effect minimization measures, the Proposed Action would not result in unauthorized takes of migratory birds or bald or golden eagles. The Proposed Action may affect, but is not likely to adversely affect, the tricolored bat. The Proposed Action would have no effect on any other threatened or endangered species. The Navy is consulting with the U.S. Fish and Wildlife Service regarding the tricolored bat. The results will be included in the Final EA.
Cultural Resources	Under the No Action Alternative, the Proposed Action would not be implemented, and there would be no effect to historic properties.	The Navy has determined that the Proposed Action would not result in adverse effects to historic properties and would therefore not result in significant effects to cultural resources.

Notes: % = percent; APZ = Accident Potential Zone; CBUAS = Carrier-Based Unmanned Aircraft System; DNL = day-night average sound level; EA = Environmental Assessment; GBDAA/LSTAR = Ground-Based Detect and Avoid/Lightweight Surveillance and Target Acquisition Radar; I- = Interstate; NAVSTA = Naval Station; U.S. = United States

**Table 3-13 Environmental Effects Avoidance and Minimization Measures**

<i><b>Applicable Resource Area</b></i>	<i><b>Effect Avoidance/Minimization Measures</b></i>	<i><b>Anticipated Benefit/Evaluating Effectiveness</b></i>	<i><b>Responsibility</b></i>	<i><b>Compliance Schedule</b></i>	<i><b>Verification of Compliance</b></i>
Biological Resources	All vehicles, equipment, and footwear would be cleaned of dirt, debris, seeds, mud, and visible plant material prior to being brought onto and before leaving the project area. Vehicles would also be cleaned after construction prior to being used elsewhere on NAVSTA Norfolk. Any weeds removed would be placed in bags or dumpsters and hauled away.	Prevent the introduction and spread of invasive non-native species.	Construction contractor	During construction	NAVSTA Norfolk Natural Resources
Biological Resources	Continued implementation of avoidance and minimization measures outlined in the installation BASH Management Plan and INRMP (NAVFAC, 2022; NAVSTA Norfolk, 2020a).	Minimize the risk of collision with wildlife, including migratory birds, during aircraft operations.	NAVSTA Norfolk Natural Resources	During operations	NAVSTA Norfolk Natural Resources
Water Resources	In the event groundwater is encountered during construction, the construction contractor would contact NAVSTA Norfolk environmental staff to determine if a permit is needed. If the groundwater is uncontaminated, it may be discharged to an authorized non-stormwater discharge under the VSMP Construction General Permit as long as it has been filtered, settled, or similarly treated.	Minimize effects to groundwater, if encountered during construction.	Construction contractor	During construction	NAVSTA Norfolk Environmental

**Table 3-13 Environmental Effects Avoidance and Minimization Measures**

<i><b>Applicable Resource Area</b></i>	<i><b>Effect Avoidance/Minimization Measures</b></i>	<i><b>Anticipated Benefit/Evaluating Effectiveness</b></i>	<i><b>Responsibility</b></i>	<i><b>Compliance Schedule</b></i>	<i><b>Verification of Compliance</b></i>
Water Resources	Implement appropriate construction management BMPs, such as requiring all construction equipment to be in good condition and properly maintained to avoid the potential for spills and leaks.	Minimize potential effects to water quality from inadvertent spills and leaks from equipment during construction.	Construction contractor	During construction	NAVSTA Norfolk Environmental
Water Resources	Obtain authorization under the VSMP Construction General Permit (VAR10) from the VDEQ before starting construction activities. The Construction General Permit requires that the permittee develop a Stormwater Pollution Prevention Plan in accordance with Part II of the VAR10 General Permit to minimize water quality degradation through establishing project-specific BMPs, including implementing a Spill Prevention Control and Countermeasure plan. The construction contractor would be required to implement all appropriate BMPs for erosion and sediment as outlined in the Stormwater Pollution Prevention Plan. Construction-related erosion control measures could include, but not be limited to, erosion control blankets, soil stabilizers, silt fencing, sandbags, and storm drain inlet protection devices.  Applicable BMPs would be included in the preliminary engineering design and construction of facilities.	Minimize effects to water resources during construction.	Construction contractor	Prior to construction	NAVSTA Norfolk Environmental

**Table 3-13 Environmental Effects Avoidance and Minimization Measures**

<i><b>Applicable Resource Area</b></i>	<i><b>Effect Avoidance/Minimization Measures</b></i>	<i><b>Anticipated Benefit/Evaluating Effectiveness</b></i>	<i><b>Responsibility</b></i>	<i><b>Compliance Schedule</b></i>	<i><b>Verification of Compliance</b></i>
Water Resources	Incorporate proper post-construction stormwater management features into the project planning and site design to ensure compliance with the Energy Independence and Security Act (Section 438), Department of the Navy Low Impact Development Policy, and VSMP Law and Regulations.	Minimize effects to water resources from proposed facilities.	Project proponent	During facility design	NAVSTA Norfolk Environmental
Air Quality	Covering or watering piles and/or access roads, limiting the speed of grading and earth-moving equipment to 15 miles per hour or less, operating water trucks for stabilization of surfaces under windy conditions, installing wind fencing, and phasing grading operations.	Reduce PM <sub>10</sub> emissions during construction.	Construction contractor	During construction	NAVSTA Norfolk Environmental
Cultural Resources	Implement ICRMP Standard Operating Procedure #11, Survey, Management, and Treatment of Archaeological Resources, which contains instructions for conducting archaeological investigations prior to ground-disturbing activities; implement ICRMP Standard Operating Procedure #12, Project Specific Standard Treatment of Archaeological Resources, which contains instructions for inadvertent discovery of archaeological materials and for human remains.	Minimize adverse effects on archaeological resources.	Standard Operating Procedure #11: NAVSTA Norfolk Environmental Standard Operating Procedure #12: Construction Contractor	Standard Operating Procedure #11: Prior to ground-disturbing operations Standard Operating Procedure #12: During ground-disturbing activities	NAVSTA Norfolk Cultural Resources Management



**Table 3-13 Environmental Effects Avoidance and Minimization Measures**

<i><b>Applicable Resource Area</b></i>	<i><b>Effect Avoidance/Minimization Measures</b></i>	<i><b>Anticipated Benefit/Evaluating Effectiveness</b></i>	<i><b>Responsibility</b></i>	<i><b>Compliance Schedule</b></i>	<i><b>Verification of Compliance</b></i>
Cultural Resources	Design and construction of the new hangar adjacent to the Naval Air Station Historic District would take into account the recommended approaches in the Setting and New Additions to Historic Buildings sections of the Secretary of Interior Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (National Park Service, 1995).	Avoid adverse effects to the Naval Air Station Historic District.	NAVSTA Norfolk Environmental	During facility design	NAVSTA Norfolk Cultural Resources Manager

*Notes:* # = Number; BASH = bird/animal aircraft strike hazard; BMP = best management practice; ICRMP = Integrated Cultural Resources Management Plan; INRMP = Integrated Natural Resources Management Plan; NAVSTA = Naval Station; PM<sub>10</sub> = particulate matter less than or equal to 10 microns in diameter; SWPPP = Stormwater Pollution Prevention Plan; VDEQ = Virginia Department of Environmental Quality; VSMP = Virginia Stormwater Management Program

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## 4 Cumulative Effects

This section (1) defines cumulative effects, (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative effects, (3) analyzes the incremental interaction the Proposed Action may have with other actions, and (4) evaluates cumulative effects potentially resulting from these interactions.

### 4.1 Definition of Cumulative Effects

The approach taken in the analysis of cumulative effects follows the objectives of the National Environmental Policy Act (NEPA). Cumulative impacts are defined in 40 Code of Federal Regulations (CFR) section 1508.1(i) (2024) as effects on the environment that result from the incremental effects of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time.”

To determine the scope of environmental effects analyses, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant effects and should therefore be discussed in the same document.

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or close to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative effects. To identify cumulative effects, the analysis needs to address the following three fundamental questions.

- Does a relationship exist such that affected resource areas of the Proposed Action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by effects of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant effects not identified when the Proposed Action is considered alone?

### 4.2 Scope of Cumulative Effects Analysis

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this Environmental Assessment (EA), the study area delimits the geographic extent of the cumulative effects analysis. In general, the study area will include those areas previously identified in Chapter 3, *Affected Environment and Environmental Consequences*, for the respective resource areas. The time frame for cumulative effects centers on the timing of the Proposed Action.

Another factor influencing the scope of cumulative effects analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the Proposed Action, the analysis employs the measure of “reasonably foreseeable” to include or

exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for Environmental Impact Statements and EAs, management plans, land use plans, and other planning-related studies.

### 4.3 Past, Present, and Reasonably Foreseeable Actions

This section focuses on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative effects analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in Section 4.1, *Definition of Cumulative Effects*, it was determined if a relationship exists such that the resource areas affected by the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative effects analysis. In accordance with Council on Environmental Quality guidance (CEQ, 2005), these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision-making. Projects included in the cumulative effects analysis are listed in Table 4-1 and briefly described in the following subsections.

**Table 4-1 Cumulative Action Evaluation**

<b>Action</b>	<b>Level of NEPA Analysis Completed</b>
<b>Past Actions</b>	
Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point	CATEX
P404 Airborne Command Control Logistics Weapons School	CATEX
<b>Present and Reasonably Foreseeable Future Actions</b>	
Airfield Obstruction Management Plan	EA
I-64 Hampton Roads Bridge-Tunnel Expansion	EIS and SEIS
Transition to CMV-22B at Fleet Logistics Centers	EA
Pier 3 and CEP-176 wharf	CATEX
NAVSTA Norfolk Special Construction Projects	CATEX

Notes: CATEX = categorical exclusion; CEP = controlled entry point; EA = Environmental Assessment; EIS = Environmental Impact Statement; I- = Interstate; MCAS = Marine Corps Air Station; NAVSTA = Naval Station; NEPA = National Environmental Policy Act; SEIS = Supplemental Environmental Impact Statement

#### 4.3.1 Past Actions

##### 4.3.1.1 Relocation of VMM-774 from Naval Station Norfolk to Marine Corps Air Station Cherry Point

Marine Corps Reserve squadron VMM-774 operated the MV-22B from Naval Station (NAVSTA) Norfolk since 2016. This squadron, composed of 109 full-time and 130 reserve personnel, relocated from NAVSTA Norfolk to Marine Corps Air Station (MCAS) Cherry Point, Havelock, North Carolina, in June 2022. This squadron operates and maintains 12 MV-22B aircraft and conducted approximately 4,750 annual operations at NAVSTA Norfolk.

#### **4.3.1.2 P404 Airborne Command Control Logistics Weapons School**

This project constructed an approximately 30,000 square foot, two-story operational training facility for E-2D aircraft. The building included two E-2D weapon system trainers (two tactics trainers and two aircrew procedures trainers) and two E-2D distributed readiness trainers, two tactics trainer instructor areas, two mission brief/debrief rooms, and various classrooms, offices, and support infrastructure. Construction began in 2022 and was completed in 2024.

#### **4.3.2 Present and Reasonably Foreseeable Actions**

##### **4.3.2.1 Airfield Obstruction Management Plan**

This action included implementation of an Airfield Obstruction Management Plan (formerly Clear Zone Management Plan) for NAVSTA Norfolk Chambers Field that provided management recommendations to eliminate vegetation height obstructions and reduce safety risks to aircraft operations. Management is ongoing, including a current action to remove approximately 400 trees obstructing the Chambers Field glide slope (path of descent for an aircraft preparing to land) posing an unacceptable safety risk. A major tree removal effort (117 trees) occurred in 2023 on city-owned property; however, a timeline for completion for the remaining trees has not been finalized. Maintenance of Chambers Field vegetation to address flight risk obstructions would be conducted for the foreseeable future.

##### **4.3.2.2 Interstate (I-) 64 Hampton Roads Bridge-Tunnel Expansion**

This action will ease congestion of Interstate (I-) 64 by widening the existing four-lane segments to six lanes between I-564 in Norfolk and I-664 in Hampton for 10 miles and provide new twin tunnels across the harbor. The action began in 2019 and is scheduled to be substantially complete by April 2027 and final completion by August 2027.

##### **4.3.2.3 Transition to CMV-22B at Fleet Logistics Centers**

This action will provide facilities and functions to support the replacement of the existing C-2A aircraft with CMV-22B aircraft at Naval Air Station North Island and NAVSTA Norfolk. At NAVSTA Norfolk, this action would result in a decrease from 17 aircraft to 15 aircraft and a reduction in 126 personnel. The action would include construction and/or renovation of facilities such as aircraft hangars, parking aprons, taxiways, helipads, wash racks, and pilot training and maintenance training facilities. Hangar space construction and pavement renovation would total approximately 62,000 square feet and 24 acres at NAVSTA Norfolk. The new hangar will be located east of Hangar LP48; the pavement renovations would occur at existing paved areas, and taxiways would be expanded (increasing impervious surfaces by 2.4 acres). The Navy anticipates a total of approximately 7,000 annual CMV-22B airfield operations at NAVSTA Norfolk, which would be about the same as current C-2A operations that the CMV-22B is replacing. Transition from the C-2 to the CMV-22B began in 2023 and will be complete by 2028.

##### **4.3.2.4 Pier 3 and CEP-176 Wharf**

This project constructs a new Pier 3 and CEP-176 wharf at NAVSTA Norfolk to support berthing of Los Angeles, Virginia, and Virginia Payload Module Class submarines. The project would provide shore-to-ship utilities, correct deficiencies of existing bulkhead CEP-102, construct new relieving platform and new Utility Service Building, outfit Pier 4 south for berthing of submarines during project construction, demolish Pier 3 and Pier 3T, perform dredging, and construct an antiterrorism security enclave. The new Pier 3 will be a reinforced concrete single-deck pier, 1,330 feet long and 85 feet wide,

and the new wharf will be 800 feet long and 100 feet wide and would replace part of the existing CEP-176 bulkhead. Construction began in 2022 and will be complete by 2026.

#### **4.3.2.5 NAVSTA Norfolk Special Construction Projects**

These projects are considered sustainment and include maintenance and repair activities typical to keep facilities in good working condition. The Navy defines sustainment as regularly scheduled maintenance as well as cyclical major repairs or replacement of components that occur periodically over the expected service life of the facilities. Projects include needed utility upgrades or facility improvements. Several programmed future projects include utilities (gravity sewer pipe, rehabilitate duct banks, oily water and waste water lines); and sustainment such as repairs to walls and windows, bulkheads, airfield flood improvements, taxiway and parking apron repairs, and installing an Instrument Landing System. These projects would typically require a NEPA Categorical Exclusion.

### **4.4 Cumulative Effects Analysis**

Where feasible, the cumulative effects were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data are not available, and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative effects related to this EA where possible. The analytical methodology presented in Chapter 3, *Affected Environment and Environmental Consequences*, which was used to determine potential effects to the various resources analyzed in this document, was also used to determine cumulative effects where possible.

#### **4.4.1 Public Health and Safety**

##### **4.4.1.1 Description of Geographic Study Area**

The region of influence (ROI) for cumulative effects on public health and safety is defined as the limits of the proposed project area and the proposed flight paths of the Stingray Carrier-Based Unmanned Aircraft System (CBUAS).

##### **4.4.1.2 Relevant Past, Present, and Future Actions**

Construction activities on NAVSTA Norfolk would have no effect on public health and safety because the installation is not accessible to the general public. Therefore, only those past, present, or reasonably foreseeable future actions that involve changes in aircraft, numbers of operations, and potential bird/animal aircraft strike hazard (BASH) risk at NAVSTA Norfolk would have cumulative effects when considered with the Proposed Action (Airfield Obstruction Management Plan, Transition to CMV-22B at Fleet Logistics Centers, and Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point). Table 4-2 presents data for the Proposed Action and potential cumulative projects.

The Airfield Obstruction Management Plan provides for removal of vegetative height obstructions, making the airfield safer for air navigation. It also provides for reduction of attractive wildlife habitat surrounding the runway, thereby reducing BASH risk and increasing safety. The Transition to CMV-22B at Fleet Logistics Centers would convert operations from 17 C-2 Greyhound aircraft to 15 CMV-22B aircraft while conducting approximately the same number of annual operations (7,000). Because of the similarity of operations and no changes to Accident Potential Zones (APZs) or any other safety programs, it was determined that there would be no measurable effects to flight safety. The Relocation of

VMM-774 from NAVSTA Norfolk to MCAS Cherry Point eliminated 4,750 annual MV-22B operations at NAVSTA Norfolk. This resulted in a corresponding slight decrease in BASH risk at NAVSTA Norfolk.

**Table 4-2      Airspace Potential Cumulative Effects**

<b>Project</b>	<b>Number of Aircraft</b>	<b>Annual Operations</b>	<b>BASH Risk</b>
Proposed Action	20 Stingray CBUAS	960 Stingray CBUAS 2,880 (chase aircraft operations)	Potential increase
Vegetation Management	No change	No change	Reduce risk
Transition to CMV-22B	-2 Change from 17 C-2 to 15 CMV-22B	No change	No change
Relocate VMM-774	-12 MV-22	-4,750	Reduce risk
Net change	6	-910	Reduce risk

Notes: - = minus; BASH = bird/animal aircraft strike hazard; CBUAS = Carrier-Based Unmanned Aircraft System

#### 4.4.1.3 Cumulative Effect Analysis

The net changes to aircraft and number of operations are presented in Table 4-2. As shown, there would be a small cumulative increase in the number of aircraft, but the annual operations would decrease. Overall, the BASH risk would change but would likely be reduced with implementation of the Vegetation Management Plan. All aircraft operations would occur within existing controlled airspace. Policies and procedures are and/or will be in place to reduce the risk of flight mishaps. All flight and training operations would be conducted in accordance with Federal Aviation Administration regulations and directives, specific operating manuals, and Department of Defense (DoD) Flight Information Publications. In the event of an emergency associated with the flight operations, the situation would be handled in accordance with established aircraft-specific procedures. Furthermore, the Proposed Action would not require changes to the installation's safety plans, APZs, or BASH Management Plan. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in significant cumulative public health and safety effects within the ROI.

#### 4.4.2 Noise

##### 4.4.2.1 Description of Geographic Study Area

The ROI for cumulative effects to noise is the area in proximity to the proposed hangar renovation site, areas along commuter access roads, and areas affected by the day-night average sound level (DNL) noise contours for proposed aircraft operations.

##### 4.4.2.2 Relevant Past, Present, and Future Actions

Noise from construction on NAVSTA Norfolk would have no effect on noise-sensitive points of interest. Cumulative noise may be generated by trucks delivering materials to future action project sites if construction time frames overlap.

Operations associated with the Proposed Action would have negligible noise effects. Past and present use of the NAVSTA Norfolk airfield has generated a noise environment surrounding NAVSTA Norfolk that is represented by noise contours last published in the 2009 Air Installations Compatible Use Zones Study for NAVSTA Norfolk Chambers Field (NAVFAC, 2009). Noise modeling conducted for the Transition to CMV-22B at Fleet Logistics Centers at NAVSTA Norfolk showed that, because the total annual operations are almost identical, there would be negligible changes to noise over existing conditions (Navy, 2018b).

The Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point would be expected to result in a negligible decrease in noise. Noise modeling conducted for the home basing of this aircraft at NAVSTA Norfolk determined that the change to the existing noise environment would be almost indistinguishable (Marine Corps, 2015). The departure of VMM-774 from NAVSTA Norfolk would result in a similar, indistinguishable change in noise.

#### **4.4.2.3 Cumulative Effects Analysis**

Cumulative noise effects associated with past, present, and future aircraft operations actions within the ROI would be less than significant because the identified cumulative actions would maintain or slightly decrease the annual number of operations at NAVSTA Norfolk. The noise analysis of the Proposed Action is based on the projected operations of Stingray CBUAS and chase aircraft and considered the total annual operations. The analysis as discussed in Section 3.2, *Noise*, therefore, is representative of cumulative conditions. The analysis found that the increase in annual operations would result in a 0.3-decibel (dB) increase in DNL and a small increase in single-event sound exposure levels. In addition, noise-sensitive points of interest, and DNL noise contours at NAVSTA Norfolk would not experience a significant change from existing conditions due to Stingray CBUAS and chase aircraft operations.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in significant cumulative noise effects within the ROI.

#### **4.4.3 Transportation**

##### **4.4.3.1 Description of Geographic Study Area**

The ROI for transportation cumulative effects is the Navy Triangle Influence Area (NTIA). The NTIA is located within Norfolk and is bounded approximately by the Willoughby Bay to the north, Terminal Boulevard to the south, the James River and Elizabeth River to the west, and I-64 to the east.

##### **4.4.3.2 Relevant Past, Present, and Future Actions**

Relevant projects are those that occur in the NTIA and increase the number of vehicles using roads in the NTIA, including implementation of the Airfield Obstruction Management Plan, Transition to CMV-22B at Fleet Logistics Centers, P404 Airborne Command Control Logistics Weapons School, Pier 3 and CEP176 wharf, Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point, and NAVSTA Norfolk special construction projects.

All of the identified projects above, with the exception of the Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point, would cause increase in vehicles from construction associated traffic. During the construction period, there would be a short-term increase in construction workers and construction vehicles traveling to and from NAVSTA Norfolk, Monday through Friday, primarily using Gate 22. These effects would be temporary. The projects would not all be occurring at the same time; for instance, construction at P404 is complete and would not contribute to cumulative effects for construction traffic. Most cumulative projects with construction traffic would be completed by 2028 with some of the small special construction projects continuing into the 2030s.

The Transition to CMV-22B at Fleet Logistics Centers and Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point would result in reductions of Navy personnel (126) and Marine Corps personnel



(109 full-time, 130 Reservists) at NAVSTA Norfolk, which would result in a slight reduction in commuter traffic on area roads. These effects would be long term.

#### **4.4.3.3 Cumulative Effects Analysis**

Cumulative effects to transportation that would occur with implementation of the Proposed Action would include minor increases in traffic within the ROI from the Proposed Action and future actions. The cumulative transportation effects from past, present, and future actions within the ROI would be less than significant because they would compose a small percentage of total traffic on access roads to NAVSTA Norfolk for both short-term construction traffic and long-term Navy personnel traffic.

The future projects at NAVSTA Norfolk when considered with the Proposed Action would result in temporary increases in privately owned vehicles and truck traffic during construction for each project. If any of the construction projects overlap in time, there would be a temporary cumulative construction traffic effect that could be experienced in the ROI for the duration of overlap between the projects and the Proposed Action. Should cumulative effects occur, there could be temporary additional traffic and congestion on roadways in the ROI. However, these increases would equate to a small increase in overall traffic on area roads.

Because the Proposed Action would increase the number of permanent commuters traveling to and from NAVSTA Norfolk, and the Transition to CMV-22B at Fleet Logistics Centers and the Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point would reduce the number of permanent commuters, there would be no long-term cumulative effect to traffic.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant cumulative traffic effects within the ROI.

#### **4.4.4 Air Quality**

##### **4.4.4.1 Description of Geographic Study Area**

The ROI for assessing cumulative air quality effects of criteria pollutants is primarily the Hampton Roads Intrastate Air Quality Control Region (AQCR). The ROI for the cumulative analysis of greenhouse gas (GHG) emission is worldwide because GHGs mix uniformly in the atmosphere. These worldwide effects would be manifested as effects to resources and ecosystems within the study area.

##### **4.4.4.2 Relevant Past, Present, and Future Actions**

Section 3.4, *Air Quality*, describes the existing air quality conditions, which reflect the aggregate effects of past and present actions within the study area. Due to these actions, the study area is a maintenance area for the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS). The context for air quality analysis provided in Section 3.4, includes adherence to state and federal plans enacted to achieve and to maintain the NAAQS and to reduce GHG emissions.

Past, present, and future activities that could contribute to air quality effects from the Proposed Action and produce cumulative air quality effects include the projects identified in Table 4-1. These projects would generate air emissions from construction projects, changes in personnel numbers and associated traffic, and aircraft operations at NAVSTA Norfolk. Potential cumulative projects include Airfield Obstruction Management Plan, I-64 Hampton Roads Bridge-Tunnel Expansion, Transition to CMV-22B at Fleet Logistics Centers, P404 Airborne Command Control Logistics Weapons School, Pier 3 and CEP-176

wharf, Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point. Construction activities related to these projects would include the use of heavy equipment for site preparation and development that would result in criteria pollutant and GHG emissions within the immediate area. However, air emissions would be temporary and typical of standard construction activities. In addition, the AQCR has the potential for future development and growth. This future growth, combined with the addition of the cumulative projects identified above, could contribute to a net increase in overall cumulative emissions in the project region compared to existing conditions. However, the Virginia State Implementation Plan implemented by the Virginia Department of Environmental Quality (VDEQ) includes emission reduction strategies that would further progress towards maintenance of the NAAQS in the study area. The transition from C-2A to CMV-22B and the Relocation of VMM 774 from NAVSTA Norfolk to MCAS Cherry Point would result in reduced operational emissions in the AQCR (Navy, 2018b; Marine Corps, 2015).

#### 4.4.4.3 Cumulative Effects Analysis

Cumulative air quality effects from the Proposed Action are based on the increase in emissions that would occur from the action, in combination with emissions from cumulative projects. The following qualitative analyses considered the cumulative effects of these emissions regarding their potential (1) to contribute to an exceedance of the NAAQS and (2) to contribute to the total amount of GHGs in the atmosphere.

##### Criteria Pollutants

The analysis in Section 3.4, *Air Quality*, concluded that air emissions from construction or operation of the Proposed Action would not contribute to an exceedance of the NAAQS. The analysis also determined that action would generate ozone precursor emissions that would be well below the conformity *de minimis* thresholds applicable to the AQCR. Potential air quality effects from cumulative construction projects could result in cumulative effects to air quality if projects overlap in time and/or occur near the Proposed Action. When considered cumulatively, construction activities at and within the vicinity of NAVSTA Norfolk would collectively increase air emissions in the area, but variations in the timing of cumulative projects and the relatively short duration of project effects would moderate effects over space and time and would not have a significant effect on regional air quality. The transition from the C-2A to CMV-22B aircraft and the Relocation of VMM 774 from NAVSTA Norfolk to MCAS Cherry Point would result in reduced operational emissions from these cumulative projects within the AQCR. In addition, implementation of the Virginia State Implementation Plan by the VDEQ would limit regional emissions and resulting cumulative effects from future growth and development within the ROI. As a result, emissions from the Proposed Action, combined with emissions from past, present, and reasonably foreseeable future projects, would not contribute to an exceedance of the NAAQS. Therefore, cumulative air quality effects from the Proposed Action within the ROI would not be significant.

##### Greenhouse Gases

Table 3-9 presents estimates of annual GHG emissions that would occur from construction and operation of the Proposed Action for each calendar year of activity. Annual operations from the Proposed Action after year 2034 would result in the same amount of emissions as those presented in Table 3-9 for year 2034. These emissions are equivalent to the annual energy usage of 3,892 households (USEPA, 2025b). The main source of GHG emissions would occur from proposed aircraft operations.

GHG emissions from the Proposed Action would negligibly contribute to the total amount of GHG in the atmosphere.

To minimize GHG emissions from the Proposed Action, project emission sources would comply with applicable regulations and GHG policies, and for mobile sources, federal vehicle clean fuels, mileage efficiency, and emissions regulations. The Navy would continue to implement proactive measures to reduce their overall GHG emissions by decreasing the use of fossil fuels and increasing the use of alternative energy sources in accordance with the goals set by the Energy Policy Acts of 2005 and 2020, and Navy and DoD policies. These GHG initiatives are not emission reductions proposed to offset GHG emissions generated by the Proposed Action, but rather demonstrate initial responses for the Navy to factor GHG management into Navy proposals and impact analyses.

#### **4.4.5 Water Resources**

##### **4.4.5.1 Description of Geographic Study Area**

The ROI for water resources includes the project area footprint of the Proposed Action, and the immediate surrounding areas affected by increased runoff due to the addition of impervious surface area.

##### **4.4.5.2 Relevant Past, Present, and Future Actions**

Table 4-1 identifies those past, present, and reasonably foreseeable projects that have the most potential to contribute to cumulative water effects when combined with the Proposed Action. These projects include construction for the Transition to CMV-22B at Fleet Logistics Centers and P404 Airborne Command Control Logistics Weapons School. Other projects listed in Table 4-1 would not affect the water resources ROI.

Construction associated with the identified projects could result in soil disturbance, changes in impervious surface area, and changes in surface runoff, resulting in effects to water quality. Prior to executing these projects, applicable permits would be obtained as necessary, including a Virginia Pollutant Discharge Elimination System Construction General Permit. Permit requirements and best management practices, such as a Stormwater Pollution Prevention Plan, would be implemented during construction to minimize effects. In addition, the Navy would be required to comply with applicable standards and policies for post-construction stormwater management under the Energy Independence and Security Act of 2007; Navy Low Impact Development standards; Chief of Naval Operations Instruction 4100.5E; EO 13834, *Efficient Federal Operations*; and NAVSTA Norfolk's Virginia Pollutant Discharge Elimination System industrial stormwater permit (Permit No. VA0004421) and Phase II Municipal Separate Storm Sewer System permit (Permit No. VAR040114). By adhering to these regulations and orders, the effects to water quality post-construction would be minimized.

##### **4.4.5.3 Cumulative Effects Analysis**

Cumulative water resource effects from past, present, and future actions within the ROI would be less than significant. Best management practices would be used during construction for all projects to protect water quality in accordance with applicable permits and storm water protection plans. In addition, the Navy would be required to comply with applicable standards and policies for post-construction stormwater management under the Energy Independence and Security Act of 2007

and Navy Low Impact Development standards. Adherence to these requirements would protect water quality and minimize any cumulative effects.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in significant cumulative effects to water resources.

#### **4.4.6 Biological Resources**

##### **4.4.6.1 Description of Geographic Study Area**

The ROI for biological resources includes the project area footprint of the Proposed Action and immediately surrounding areas potentially exposed to noise or visual effects during construction and operations.

##### **4.4.6.2 Relevant Past, Present, and Future Actions**

Table 4-1 identifies those past, present, and reasonably foreseeable projects that have the potential to contribute to cumulative effects when combined with the Proposed Action. These projects include the Transition to CMV-22B at Fleet Logistics Centers, the Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point, and P404 Airborne Command Control Logistics Weapons School. Other projects in Table 4-1 would not affect the ROI of the Proposed Action for biological resources.

Implementation of the Vegetation Management Plan would reduce the BASH risk by maintaining vegetation height and make the end of the runway less attractive to wildlife. Construction activities associated with Transition to CMV-22B at Fleet Logistics Centers would occur within the developed areas of NAVSTA Norfolk that are devoid of biological resources and would therefore not affect biological resources. The Transition to CMV-22B at Fleet Logistics Centers would not result in an increase in aircraft operations at NAVSTA Norfolk and a noise study determined that noise effects of the CMV-22B would be negligible and imperceptible (Navy, 2018b). This action would have no effect on threatened and endangered species habitat, vegetation terrestrial wildlife, marine wildlife, or aquatic biological resources (Navy, 2018b). The Relocation of VMM-774 from NAVSTA Norfolk to MCAS Cherry Point would decrease BASH risk at NAVSTA Norfolk and would likely result in an imperceptible decrease in overall noise. This action would not affect biological resources at NAVSTA Norfolk. There are no biological resources at the location of the P404 Airborne Command Control Logistics Weapons School, and this action is complete.

##### **4.4.6.3 Cumulative Effects Analysis**

Construction of the Proposed Action and other potential cumulative projects would not include attractants that would increase the concentration of birds at the airfield. Therefore, cumulative construction projects would not pose effects on biological resources.

The overall changes in aircraft operations would result in a small net decrease in annual operations. All operations would be conducted in accordance with NAVSTA Norfolk's existing BASH Management Plan. In addition, current airspace safety procedures, maintenance, training, and inspections would continue to be implemented, and airfield flight operations would adhere to established safety procedures. Therefore, there would be no cumulative increased BASH risk to wildlife. Cumulative noise effects would be negligible because of the net decrease in annual operations. Therefore, there would be no cumulative noise effects to wildlife.

As a result, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in significant cumulative biological resources effects within the ROI.

#### **4.4.7 Cultural Resources**

##### **4.4.7.1 Description of Geographic Study Area**

The ROI is equivalent to the Area of Potential Effects described in Section 3.7.2, *Cultural Resources, Affected Environment*, and the surrounding viewing area.

##### **4.4.7.2 Relevant Past, Present, and Future Actions**

Relevant past, present, and future actions include construction projects associated with the transition to CMV-22B at Fleet Logistics Centers and P404 Airborne Command Control Logistics Weapons School. Both of these projects would construct large buildings in the vicinity of Proposed Action construction projects. These buildings may also be within view of components of the former Naval Air Station Historic District that are eligible or may be eligible for listing in the National Register of Historic Places. The Navy determined that the construction of these buildings would have no adverse effect on cultural resources, and the Virginia Department of Historic Resources concurred with the determinations.

##### **4.4.7.3 Cumulative Effects Analysis**

The potential cumulative projects would have no adverse effect on cultural resources. The Navy is consulting with the Virginia Department of Historic Resources on the Proposed Action and the results of consultation will be provided in the Final EA. Adverse effects are not expected.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in cumulative cultural resources effects within the ROI

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## 5 Other Considerations Required by the National Environmental Policy Act

### 5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 Code of Federal Regulations (CFR) section 1502.16(a)(5), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action and describes briefly how compliance with these laws and regulations would be accomplished.

**Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action**

<i><b>Federal, State, Local, and Regional Land Use Plans, Policies, and Controls</b></i>	<i><b>Status of Compliance</b></i>
National Environmental Policy Act (NEPA), as amended by the Fiscal Responsibility Act of 2023; Council on Environmental Quality (CEQ) NEPA implementing regulations; Navy procedures for implementing NEPA	For purposes of this EA, the Navy has voluntarily elected to generally follow those CEQ regulations at 40 CFR parts 1500–1508 that were in place at the outset of this EA, in addition to the Navy’s procedures/regulations implementing NEPA at 32 CFR part 775, to meet the agency’s obligations under NEPA, 42 U.S.C. sections 4321 et seq. Appropriate public participation and review are being conducted in compliance with NEPA.
Clean Air Act	The applicable regulatory setting and effect analysis is discussed in Section 3.4, <i>Air Quality</i> . Air emissions would be minimal or <i>de minimis</i> , and the Proposed Action is exempt from General Conformity requirements. A Record of Non-Applicability has been completed and is provided in Appendix A, <i>Air Quality Methodology and Calculations</i> .
Clean Water Act	The applicable regulatory setting and effect analysis is discussed in Section 3.5, <i>Water Resources</i> . Prior to implementing the Proposed Action, the Navy would obtain the necessary permits (i.e., Virginia Pollutant Discharge Elimination System Construction General Permit, Sections 404 and 401 of the Clean Water Act permits) and adhere to all permit conditions.
Coastal Zone Management Act	The Navy has determined, based on similar past actions and on the analysis presented in this EA, that the proposed federal agency action may have an effect on a coastal use or resource of the Commonwealth of Virginia’s coastal zone and would be consistent to the maximum extent practicable with the applicable enforceable policies of the Virginia Coastal Zone Management Program. The Coastal Consistency Determination and the Virginia Department of Environmental Quality concurrence will be provided in an appendix of the Final EA.

**Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action**

<i><b>Federal, State, Local, and Regional Land Use Plans, Policies, and Controls</b></i>	<i><b>Status of Compliance</b></i>
National Historic Preservation Act	In compliance with Section 106 of the National Historic Preservation Act, the Navy will consult with the Virginia Department of Historic Resources, which acts as the State Historic Preservation Officer, regarding its determination of no adverse effects on historic properties for the Proposed Action. Consultation results with the Virginia Department of Historic Resources will be included in an appendix of the Final EA. Implementation of the undertaking in accordance with the findings as documented will fulfill the Navy's responsibilities under Section 106.
Endangered Species Act	The applicable regulatory setting and effect analysis is discussed in Section 3.6, <i>Biological Resources</i> . The Navy is consulting with the United States Fish and Wildlife Service regarding potential effects to the proposed endangered tricolored bat. The results of the consultation will be included in the Final EA.
Migratory Bird Treaty Act	The applicable regulatory setting and effect analysis is discussed in Section 3.6, <i>Biological Resources</i> . The Navy has determined that the flight operations under the Proposed Action may result in the "take" of migratory birds. The Proposed Action, however, is a military readiness activity; therefore, "take" is in compliance with the Migratory Bird Treaty Act in the absence of any population-level effects on native bird species. Continued implementation of the BASH Management Plan at NAVSTA Norfolk would reduce incidence of "take" resulting from flight operations.
Bald and Golden Eagle Protection Act	The applicable regulatory setting and effect analysis is discussed in Section 3.6, <i>Biological Resources</i> . Norfolk currently holds a Federal Eagle Depredation Permit (Permit Number MB72329C-0), which is maintained by the NAVSTA Norfolk Natural Resource Program. Under this permit, NAVSTA Norfolk is authorized to use nonlethal scare devices, scare tactics, or frightening devices to move or disperse bald eagles endangering human safety due to a high risk of a serious bird strike to landing and departing aircraft. Pursuant to the Bald and Golden Eagle Protection Act and implementing guidance, prohibited take of an eagle is unlikely due to the relative scarcity of eagle nests in the vicinity of NAVSTA Norfolk and the implementation of the BASH Management Plan. No additional Bald and Golden Eagle Protection Act permits are required.
Comprehensive Environmental Response, Compensation, and Liability Act	The Proposed Action would mostly occur outside of known contaminated sites and would not interfere with ongoing installation contamination investigation and remediation programs or efforts. Work performed within site LP-20 would be coordinated with NAVSTA Norfolk's Environmental Restoration Program. NAVSTA Norfolk has an existing Environmental Restoration Program that is actively addressing the cleanup of contaminated sites at the installation.



**Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action**

<b><i>Federal, State, Local, and Regional Land Use Plans, Policies, and Controls</i></b>	<b><i>Status of Compliance</i></b>
Emergency Planning and Community Right-to-Know Act	Any releases of toxic chemicals resulting from the Proposed Action or storage of hazardous chemicals meeting storage quantity thresholds resulting from the Proposed Action will be reported per Emergency Planning and Community Right-to-Know Act reporting requirements. NAVSTA Norfolk tracks the use and storage of all toxic and hazardous chemicals and reports this information, as required, to the U.S. Environmental Protection Agency, which makes the data publicly available.
Resource Conservation and Recovery Act	Hazardous material and waste at NAVSTA Norfolk are managed in accordance with Commander, Navy Region Mid-Atlantic Instruction 6280.1A, <i>Regional Consolidated Hazardous Material Reutilization and Inventory Management Program</i> and the <i>Hazardous Waste Minimization and Disposal Guide</i> . Wastes associated with the Proposed Action would be handled in accordance with these documents, which are implemented to ensure NAVSTA Norfolk's compliance with the Resource Conservation and Recovery Act.
Toxic Substances Control Act	Management and use of any listed chemicals would be conducted in accordance with the Toxic Substances Control Act.
Executive Order 11988, <i>Floodplain Management</i>	This order directs all federal agencies to avoid, if possible, development and other activities in the 100-year base floodplain. All construction associated with the Proposed Action is outside of the 100-year floodplain.
Executive Order 12088, <i>Federal Compliance with Pollution Control Standards</i>	The applicable regulatory setting and effect analysis is discussed in Section 3.4, <i>Air Quality</i> , and Appendix A, <i>Air Quality Methodology and Calculations</i> . The Proposed Action would not exceed National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency under the Clean Air Act. Therefore, the Proposed Action would comply with Executive Order 12088.
Executive Order 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i>	The applicable regulatory setting and effect analysis is discussed in Section 3.1, <i>Public Health and Safety</i> . The Navy concludes the Proposed Action would not result in environmental health risks or safety risks that may disproportionately affect children.
Executive Order 13175, <i>Consultation and Coordination with Indian Tribal Governments</i>	The Proposed Action would not affect any known traditional cultural properties and thus, no tribal consultation is anticipated. If tribal resources are discovered, the Navy would coordinate and consult with federally recognized tribes in compliance with Executive Order 13175.

Notes: BASH = bird/animal aircraft strike hazard; CEQ = Council on Environmental Quality; CFR = Code of Federal Regulations; EA = Environmental Assessment; NAVSTA = Naval Station; NEPA = National Environmental Policy Act; U.S. = United States; U.S.C. = United States Code

## 5.2 Relationship Between Short-Term Use of the Environment and Long-Term Productivity

The National Environmental Policy Act requires an analysis of the relationship between a project's short-term effects on the environment and the effects that these effects may have on the maintenance

and enhancement of the long-term productivity of the affected environment. Effects that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality and noise would be affected in the short term. In the long term, emissions from the Stingray Carrier-Based Unmanned Aircraft System steady-state airfield operations would be minimal, with all emissions below General Conformity *de minimis* thresholds. The construction of the facilities and operation of the Stingray Carrier-Based Unmanned Aircraft System would not significantly affect the long-term natural resource productivity of the area because they occur on previously developed land. The Proposed Action would not result in any effects that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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