MOB6

KC-46A MAIN OPERATING BASE NO.6 BEDDOWN

Final

Environmental Impact Statement (EIS) KC-46A Main Operating Base #6 (MOB 6) Beddown

Volume I – Impact Analyses

November 2023

HEADQUARTERS AIR MOBILITY COMMAND

PRIVACY ADVISORY

The Final Environmental Impact Statement (EIS) is provided in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA regulations (40 Code of Federal Regulations [CFR] 1500–1508), and the United States Department of the Air Force's (DAF) Environmental Impact Analysis Process (32 CFR 989). The NEPA EIS process provides an opportunity for public input on DAF decision making, allows the public to offer inputs on alternative ways for the DAF to accomplish what it is proposing, and solicits comments on DAF's analysis of potential environmental effects.

Public comments received on the Draft EIS allow the DAF to make better-informed decisions. Letters or other written or oral comments provided have been addressed in the Final EIS. Providing personal information was voluntary. Private addresses were compiled to develop a mailing list for those requesting copies of the EIS. However, only the names of the individuals making comments and specific comments are disclosed in the Final EIS. Personal information, home addresses, telephone numbers, and email addresses are not published in the Final EIS.

This document is compliant with Section 508 of the Rehabilitation Act, which allows assistive technology to be used to obtain available information from the document. Due to the nature of graphics, figures, tables, and images occurring in the document, accessibility is limited to a descriptive title for each item. Information regarding the EIS is available on the project website at **www.kc46amob6eis.com.**

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
92 ARW	92nd Air Refueling Wing
ACAM	Air Force Air Conformity Applicability Model
ACHP	Advisory Council on Historic Preservation
ACM	asbestos containing material
AFB	Air Force Base
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFRC	Air Force Reserve Command
AGE	Aerospace Ground Equipment
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
AMC	Air Mobility Command
AME	Alternate Mission Equipment
AMU	Aircraft Maintenance Unit
AMXS	Aircraft Maintenance Squadron
ANG	Air National Guard
AOZ	Airport Overlay Zone
APE	Area of Potential Effects
APZ	accident potential zone
ARS	Air Refueling Squadron
AST	aboveground storage tank
ATGL	Air Transportable Galley/Lavatory
BASH	Bird/Wildlife Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMP	best management practice
BOT	Boom Operator Training
C	candidate species (federal designation under ESA)
CAEP	Committee on Aviation Environmental Protection
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CTK	Consolidated Tool Kit
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
CONUS	Continental United States
CY	calendar year
CZ	Clear Zone
DAF	United States Department of the Air Force
dB	decibel
dBA	A-weighted decibel
DNL	day-night average sound level
DoD	Department of Defense
E	endangered (ESA)
EIS	Environmental Impact Statement
EIAP	Environmental Impact Analysis Process
EISA	Energy Independence and Security Act
ELAPP	Environmental Land Acquisition and Protection Program
EO	Executive Order
ERCIP	Energy Resilience and Conservation Investment Program
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESCP	Erosion and Sedimentation Control Plan
ESQD	Explosive Safety Quantity Distance
F	Federal (ESA)
FAA	Federal Aviation Administration
FAS	Floridan Aquifer System
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FGUA	Florida Governmental Utility Authority
FPPA	Farmland Protection Policy Act
FUT	Fuselage Training
FY	fiscal year
GHG	greenhouse gas
gpd	gallons per day
HABS	Historic American Building Survey
HVAC	heating, ventilation, and air conditioning
ICRMP	Integrated Cultural Resources Management Plan

IDEA	Installation Development Environmental Assessment
IDP	Installation Development Plan
INRMP	Integrated Natural Resources Management Plan
ISWMP	Integrated Solid Waste Management Plan
JLUS	Joint Land Use Study
KC-46A	KC 46A Pegasus
KC-135	KC-135 Stratotanker
kV	kilovolt
L_{eq}	equivalent sound level
$L_{eq(8h)}$	8-hour equivalent sound level
L_{max}	maximum sound level
LBP	lead-based paint
LUC	land use control
MBTA	Migratory Bird Treaty Act
MISO	Military Information Support Operations
mgd	million gallons per day
MMPA	Marine Mammal Protection Act
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
MOB	Main Operating Base
MOB 6	Main Operating Base #6
MPC/AFE	Mission Planning Center/Aircrew Flight Equipment
MS4	municipal separate storm sewer system
MSGP	Multi-Sector Generic Permit
MSL	mean sea level
MX	Maintenance
N/A	not applicable
NA	Number of Events (at or) Above a Specified Threshold
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NL	not listed (ESA)
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NZ	noise zone
O_3	ozone
OSHA	Occupational Safety and Health Administration
OWS	oil water separator
PAA	Primary Aerospace Vehicle Authorization
PCB	polychlorinated biphenyls
pCi/L	picocuries per liter
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctane acid
PFOS	perfluorooctane sulfonate
PHL	potential for hearing loss
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter less than or equal to 10 microns in diameter
Pb	lead
POI	point of interest
POL	petroleum, oil, and lubricant
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
ROI	region of influence
S	State (ESA)
SEL	sound exposure level
SERE	Survival, Evasion, Resistance, and Escape
SHPO	State Historic Preservation Officer
SO_X	sulfur oxides
Squad Ops	Squadron Operations
SWFWMD	Southwest Florida Water Management District
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
T	threatened (ESA)
T (S/A)	threatened due to similarity of appearance (ESA)
TA	Time (at or) Above a Maximum Sound Level
TCP	Traditional Cultural Property
TECO	Tampa Electric Company
TFI	Total Force Integration

tpy	tons per year
UFC	United Facilities Criteria
UR	under review (federal designation under ESA)
USAR	United States Army Reserve
USDA NRCS	United States Department of Agriculture - Natural Resources Conservation Service
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USSOCOM	United States Special Operations Command
UST	Underground Storage Tank
VOC	volatile organic compound
WOTUS	waters of the United States
WWTP	wastewater treatment plant

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MOB6
KC-46A MAIN OPERATING BASE NO.6 BEDDOWN

Cover

Final
Environmental Impact Statement for
KC-46A Main Operating Base #6 Beddown

Responsible Agencies: United States Department of the Air Force (DAF) Headquarters Air Mobility Command (AMC)

Affected Location: MacDill Air Force Base (AFB), Florida; Fairchild AFB, Washington

Proposed Action: The DAF proposes to base 24 KC-46A Pegasus (KC-46A) aircraft in two squadrons of 12 Primary Aerospace Vehicle Authorization (PAA) to establish one KC-46A active-duty location in the continental United States as part of the KC-46A Main Operating Base #6 (MOB 6) beddown. Through the screening stage of the Strategic Basing Process, the DAF determined that only MacDill AFB, FL or Fairchild AFB, WA would be reasonable alternatives for the proposed MOB 6 beddown. MacDill AFB was identified as the Preferred Alternative.

Report Designation: Final Environmental Impact Statement (EIS)

Estimated Total Cost for Preparation of the Draft and Final EIS: $1,178,968.88

Abstract: The MOB 6 beddown would include the basing of 24 KC-46A PAA and the infrastructure, facilities, airfield operations, training activities, personnel, and airspace to support the mission. The transition to KC-46A PAA would occur between fiscal years 2026 and 2028. The purpose of the Proposed Action is to recapitalize aging tanker aircraft (KC-135 Stratotanker) currently used by the DAF with the KC-46A model to better address current and future mission requirements, offer expanded capability, and provide life-cycle cost savings in comparison to continued operation of existing KC-135 Stratotankers. The Proposed Action is needed because the KC-46A would provide mission essential capabilities currently lacking in the existing tanker fleet, resulting in a fully capable, combat-operational, tanker force to accomplish aerial refueling and related worldwide missions.

This EIS has been prepared pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA; 40 Code of Federal Regulations [CFR] Parts 1500–1508) and DAF procedures for implementing NEPA (32 CFR Part 989, *Environmental Impact Analysis Process*). This EIS assesses the potential environmental consequences associated with the MOB 6 beddown. The DAF selected the MOB 6 alternative basing locations considered in the EIS using operational analysis, the results of site surveys, and military judgment factors. Resources addressed in the EIS include noise, biological resources, cultural resources, socioeconomics, soils and geology, water resources, infrastructure and transportation, land use, hazardous materials and waste, health and safety, air quality, and environmental justice and other sensitive receptors.

Inquiries regarding this EIS may be directed by postal mail to AFCEC/CZN via USPS to: Attn: KC-46A MOB 6 EIS, 2261 Hughes Ave, Suite 155, JBSA Lackland, TX 78236-9853 or via FedEx or UPS to: Attn: KC-46A MOB 6 EIS, Building 1 Bay 8 Room 6009, 3515 South General McMullen, San Antonio, TX 78226-1710.

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Summary

Introduction

The United States Department of the Air Force (DAF) proposes the continuation of ongoing efforts to recapitalize (replace and restructure) portions of the existing fleet of 1950s-era aerial refueling tankers (KC-135 Stratotanker [KC-135]) through the Main Operating Base (MOB) beddown of the modern KC-46A Pegasus (KC-46A). The KC-46A, the newest aerial refueling aircraft in the DAF fleet, provides expanded operational capabilities to receive fuel from other tankers, enables multi-point refueling to support aerial refueling efficiency, adds night vision and defensive systems, and provides an optimized command and control function compared with the existing tanker fleet. Since 2006, efforts to recapitalize tanker aircraft have occurred as a phased progression to integrate a total of 179 modern aerial refueling tankers into the Total Aircraft Inventory at DAF installations by 2029. In 2011, following several years of heavily contested bids to produce a new tanker aircraft, the KC-46A aircraft was selected for production, and a phased strategic basing plan for the new tanker program was begun.

The Air Mobility Command (AMC) is the lead command responsible for maintaining the DAF's air mobility mission, including command and control of airlift and aerial refueling. The goal of KC-46A basing and fielding is to continue to provide optimum combatant commander support, and to efficiently meet regional and global receiver demands while replacing existing KC-135s. Consistent with the prior recapitalization efforts, if an installation that has an existing tanker mission is selected for the Main Operating Base #6 (MOB 6) mission, the existing KC-135 aircraft would be either relocated to another installation or retired out of the DAF inventory, depending on the age and maintenance status of each aircraft.

Since 2014, the DAF has prepared separate Environmental Impact Statements (EISs) and issued corresponding Records of Decision for the KC-46A Formal Training Unit and MOB 1 (DAF 2014a), MOB 2 (DAF 2014b), MOB 3 (DAF 2017a), and MOB 4 (DAF 2018a) missions. Respectively, these DAF actions replaced aged tanker aircraft with KC-46A aircraft at active duty, Air National Guard (ANG), and Air Force Reserve Command (AFRC) Air Force Bases (AFBs) in Oklahoma, Kansas, New Hampshire, North Carolina, New Jersey, and California. An EIS to address the MOB 5 mission is currently being developed.

This EIS addresses DAF's MOB 6 mission to beddown two squadrons of 12 KC-46A Primary Aerospace Vehicle Authorization (PAA) and the supporting base facilities, infrastructure, and workforce to support at one active duty Continental United States AMC AFB between fiscal year (FY) 2026 and FY 2028. MacDill AFB in Florida (Alternative 1 – Preferred Alternative) and Fairchild AFB in Washington State (Alternative 2) are the only AMC active duty installations that are operating KC-135 aircraft that support aerial refueling mission operations and have the capacity to support the KC-46A MOB 6 beddown. Following the guidance in Air Force Instruction 10-503, *Strategic Basing*, these two AFBs were identified as the reasonable location alternatives for implementing the MOB 6 mission (see **Figure ES-1**).

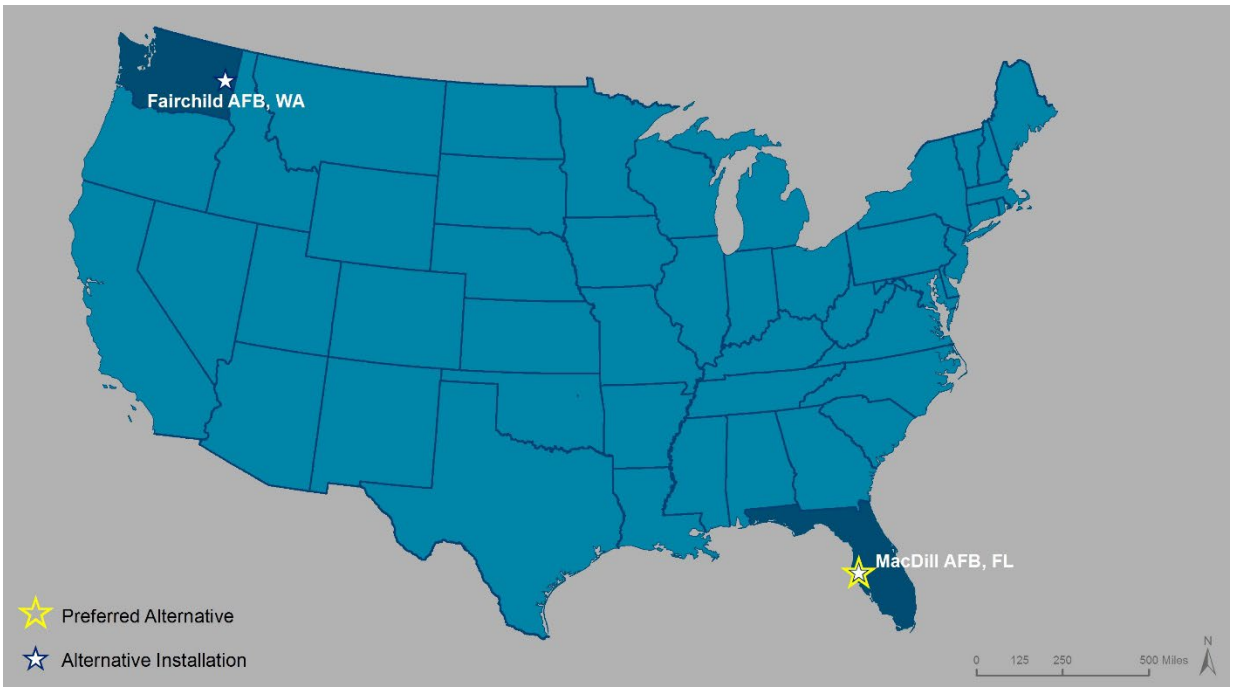

Figure ES-1. Reasonable Alternative Basing Locations for the KC-46A MOB 6 Beddown

Purpose of and Need for Proposed Action

Purpose

The purpose of the Proposed Action is to recapitalize aging tanker aircraft with the KC-46A model to better address current and future mission requirements, offer expanded capability, and provide life-cycle cost savings in comparison to continued operation of existing KC-135 aircraft.

Need

The MOB 6 beddown of the KC-46A is needed because the KC-46A would provide mission essential capabilities currently lacking in the existing tanker fleet, including receiver capability, night vision imaging system, multi-point refueling, command and control network, and defensive protection.

Description of the Proposed Action and Alternatives

Proposed Action

The Proposed Action would base 24 KC-46A aircraft in two squadrons of 12 PAA at an active duty, Continental United States location for the KC-46A MOB 6 beddown. Each squadron would require infrastructure, facilities, airfield operations, training activities, personnel, and airspace to support the KC-46A MOB 6 mission. The KC-46A MOB 6 beddown would occur in two stages: beddown and operations. The beddown stage would involve construction/retrofit of required facilities, infrastructure, and prepared surfaces, which includes renovation, alteration, and demolition. The beddown stage would also include preparing support facilities for new personnel and students to support the mission. The operational stage would involve conducting day-to-day

activities (e.g., operational missions, maintenance) at the installation, including flight operations and training in the existing regional airspace.

Key elements associated with the KC-46A MOB 6 beddown under the Proposed Action with the potential to affect environmental resources at the installation(s) or under the training airspace include the following:

- Beddown 24 KC-46A aircraft in accordance with the aircraft delivery schedule (first arrival anticipated in FY 2026; last arrival anticipated in FY 2028)
- Renovate, construct, and manage existing and new facilities and infrastructure necessary to support the mission
- Increase personnel at the installation to conform to mission requirements
- Depending on the mission, conduct sorties (i.e., flight operations that include a takeoff and landing) at each installation for pilot, copilot, and BO training and certification; aerial refueling operations; and global reach missions

The following sections identify the beddown and operational requirements for the Proposed Action at either installation.

Facilities and Infrastructure

The installation allocation and physical requirements necessary to support 24 KC-46A PAA and associated personnel are as follows:

- Three general maintenance hangars, which function primarily as inspection hangars and secondarily as repair hangars
- One fuel cell hangar, which would primarily be used to remove, repair, and replace fuel cell tanks from aircraft
- One corrosion control hangar, which includes a self-contained paint booth for touch-ups and also functions as a wash rack
- Two Squadron Operations (Squad Ops) facilities and two Aircraft Maintenance Unit (AMU) facilities, which are typically combined in a two-story facility, with the AMU on the first floor (home base for technicians and administrative functions for the flightline) and office space for command, administration, mission planning, briefing, and support on the second floor
- One Flight Training Center, consisting of:
    - Two Weapon System Trainers
    - Two Boom Operator Trainers
    - One or two Pilot Part Task Trainers
    - An adjoined or adjacent classroom
    - Office Space
- One Fuselage Training (FUT) Facility, consisting of:
    - Administrative and academic space
    - One FUT bay
    - One FUT associated cargo yard
- One Maintenance Training Facility

- Mission planning center
- Supply warehousing, flightline support facility, and aircraft parts storage
- Aerospace Ground Equipment (AGE) storage and parking
- Crash recovery shop with adequate vehicle parking
- Alternate Mission Equipment (AME) storage and maintenance facility (e.g., pallets)
- Runway that is minimally 7,000 feet long by 147 feet wide with a weight-bearing capability of 415,000 pounds
- 15 taxi on/off aircraft parking spots with fuel pits and a Type III fuel hydrant system on the parking ramp
- Radar approach control, instrument landing system, tactical air navigation system, and navigational aids that can support the KC-46A
- Appropriate fuel supply to support up to 240,000 gallons of jet fuel per day from commercial sources, storage facilities with up to 1.2 million gallons of capacity, and distribution systems
- A variety of shop areas (e.g., welding, hydraulics, composite repair, sheet metal) required for the mission
- Dormitories for all unaccompanied enlisted students and for permanently assigned, unmarried, first-term Airmen
- Adequate childcare, medical, fitness center, and other base operating support/force support

Personnel

The KC-46A MOB 6 beddown requires basing of sufficient personnel to operate and maintain the aircraft and to provide necessary support services, including active duty and AFRC enlisted, officer, Department of Defense (DoD) civilian, contractor support, and base operating support personnel. Depending on the number and types of personnel at each installation associated with the current missions, and on the proposed ANG or AFRC component of the MOB 6 missions, between 1,000 and 2,000 full-time and part-time personnel are required to support 24 PAA. This includes active duty and ANG or AFRC enlisted, officer, DoD civilian, contractor support, and base operating support personnel. The dependents or family members of full-time military personnel are also included in the analysis.

KC-46A Operations

KC-46A aircrews would complete operational sorties as part of their global reach missions as well as local training sorties to maintain proficiency in the aircraft.

Flight training, including air refueling and training in the flight simulator, provides basic and continuation aircrew training needs. A typical KC-46A proficiency training sortie would be similar to a KC-135 training sortie and would include a departure from the installation, climb to altitude for air refueling training in appropriate airspace, and return to the home installation for additional closed pattern training before landing for the sortie termination.

Proficiency training sorties to fulfill the requirements of Air Force Manual 11-2KC-46 Volume I typically depart from and return to the home installation on the same day. A global reach

mission however typically departs the home installation, returns on a later day, and accomplishes training as a by-product of the operational mission. Although some in-flight training and certification would occur during proficiency training and global reach missions, the majority of KC-46A system continuation training would be completed in simulators.

Alternatives Carried Forward for Analysis

Under Alternative 1 (Preferred Alternative), the Proposed Action would occur at MacDill AFB in Florida. Under Alternative 2, the Proposed Action would occur at Fairchild AFB in Washington State. In conformance with Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations (40 CFR Part 1502.14[c]), the EIS includes analysis of a No Action Alternative, which consists of not completing the KC-46A MOB 6 beddown and a continuation of ongoing operations and implementation of other approved plans. **Table ES-1** summarizes the comparison of the Proposed Action and alternatives, including the No Action Alternative.

No Action Alternative

The No Action Alternative for this EIS reflects the status quo, where the KC-46A beddown would not occur at any base at this time, and no change would occur to the existing KC-135 operations or mission at either installation. No construction, renovation, or demolition of any structure or other infrastructure would occur. Changes in personnel and to existing flight operations would also not occur. At each installation, ongoing and currently planned activities and programs would continue regardless of implementation of the KC-46A beddown as these activities have been approved by DAF and are supported by existing NEPA documentation.

Identification of Preferred Alternative

On December 21, 2021, the Secretary of the Air Force Public Affairs identified the Alternative 1 at MacDill AFB, Florida as the Preferred Alternative for the KC-46 MOB 6 beddown (DAF 2021b).

Table ES-1. Summary Comparison of Alternatives

Alternative Components	Alternative 1 (Preferred Alternative – MacDill AFB, Florida)		Alternative 2 (Fairchild AFB, Washington)		No Action Alternative
	Baseline	Proposed	Baseline	Proposed	
Total Change in Aircraft[a]	--	**No change in total PAA**	--	**No change in total PAA**	**No change**
Active Duty KC-135 PAA	24	0	48	24	No change from baseline at either AFB
Active Duty KC-46A PAA	0	24	0	24	
Total Change in Refueling Tanker Aircraft Operations	--	**15% increase to 13,221 operations per year[b]**	--	**29% increase to 21,600 operations per year**	**No change**
Active Duty KC-135 Operations	11,522	0	16,758	8,379	No change from baseline at either AFB
Active Duty KC-46A Operations	0	13,221	0	13,221	
Total Change in Infrastructure and Facilities	--	**Requires 21 development actions; disturbs approximately 16.6 acres, and adds approximately 9.4 acres of impervious surface**	--	**Requires 17 development actions; disturbs approximately 70.7 acres, and adds approximately 24.5 acres of impervious surface**	**No change**
Infrastructure and Facilities	See existing features shown in Chapter 2 of the EIS	Constructs 2 new facilities (+0.6 acre); renovates 7 existing facilities (+0 acre); entails 11 alteration actions to expand existing facilities and infrastructure (+8.8 acres)[e]; and upgrades by replacement of the existing hydrant fuel system, which would add 3 hydrant pits (up to 0.01 acre), resulting in an increase of approximately 9.4 acres of impervious surfaces	See existing features shown in Chapter 2 of the EIS	Constructs 5 new facilities (+7.2 acres), renovates 9 existing facilities (+0 acre), and entails 3 alteration actions to expand existing facilities and infrastructure (+17.3 acres)[e], resulting in a net increase of 24.5 acres of impervious surfaces	No change from baseline at either AFB
Total Personnel Change[c]	--	**Net increase in installation personnel and associated dependents by approximately 1%**	--	**Net increase in installation personnel and associated dependents by approximately 13%**	**No change**

Alternative Components	Alternative 1 (Preferred Alternative – MacDill AFB, Florida)		Alternative 2 (Fairchild AFB, Washington)		No Action Alternative
	Baseline	Proposed	Baseline	Proposed	
Number KC-135 Personnel[d]	3,822	-858 relocating; 2,964 realign into the KC-46A mission	3,816	-1,626 relocating; 2,190 remain and continue the KC-135 mission	No change from baseline at either AFB
Number KC-135 Dependents	4,543	-1,625 relocating; 2,918 remain	2,458	-2,458	No change
Number KC-46A Personnel[d]	0	+1,092	0	+1,964	No change
Number KC-46A Dependents	0	+1,674	0	+3,112	No change

[a] Aircraft operations change is the difference between the total baseline and total projected for all aircraft types.

[b] Percent differences represents comparison of the projected KC-46A operational capacity with the FY 2021 representative year of operational activity for the KC-135 missions at MacDill AFB and Fairchild AFB, respectively (HMMH 2022). Mission data show that flight activities have steadily increased at the installation since 2018. Despite the anticipated increase in flight operations at MacDill AFB, actual flight activities would be minimized through operational efficiency and added capabilities of the incoming KC-46A aircraft and mission to fully replace the sole existing KC-135 mission there, as well as use of simulators to conduct KC-46A system continuation training. The increase in flight operations at Fairchild AFB would be anticipated because the MOB 6 mission would be additive to the other existing and ongoing mission programs at the installation.

[c] The personnel and dependent numbers are noticeably different between the installations because the KC-46A mission at MacDill AFB would be a replacement mission and the mission at Fairchild AFB would be additive. Remaining KC-135 personnel at Fairchild AFB would continue in the ongoing KC-135 mission. The numbers of dependents and family members incoming with the KC-46A mission were conservatively estimated using the DoD's standard calculation: 2.5 times 65 percent of incoming full-time military personnel (DAF 2021d). The numbers of school-age dependents were estimated using the standard calculation of 1.5 times 65 percent of the full-time military personnel.

[d] Numbers of KC-135 and KC-46A personnel represent the sum of full-time military and civilian mission personnel at each installation (see Chapter 2 of the EIS).

[e] Additional square footage for facility expansions on existing pavement is not included in the ground disturbance or change in impervious surfaces calculations.

Key: AFB = Air Force Base; PAA = Primary Aerospace Vehicle Authorization; EIS = Environmental Impact Statement; MOB = Main Operating Base

Environmental Consequences

In compliance with NEPA, CEQ, and DAF Environmental Impact Analysis Process (32 CFR Part 989) guidelines, the EIS focuses on those resources potentially subject to impacts from the Proposed Action or alternatives, including the No Action Alternative. The environmental resources analyzed are noise, biological resources, cultural resources, socioeconomics, soils and geology, water resources, infrastructure and transportation, land use, hazardous materials and wastes, health and safety, air quality, and environmental justice and other sensitive receptors. **Table ES-2** summarizes the impacts on each of these environmental resources under each alternative.

Table ES-2. Summary of Environmental Impacts

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Noise		
Short-term, minor, adverse impacts on the noise environment would be expected under Alternative 1 due to noise generated from heavy equipment used during construction. Long-term, minor, beneficial impacts would be expected under Alternative 1 because of a decrease in land that would be affected by the 65+ dBA DNL of aircraft noise. No changes to sleep disturbing events would be expected at most of the MacDill AFB POIs selected for analysis, except for two locations where the increase in nighttime closed pattern operations conducted by the KC-46 would increase the annual number of potentially sleep disturbing events. The annual number of speech interference and classroom learning interference would decrease or remain the same in the vicinity of MacDill AFB. No change to existing noise impacts on wildlife would be expected.	Short-term, minor, adverse impacts on the noise environment would be expected under Alternative 2 due to noise generated from heavy equipment used during construction. Long-term, minor, adverse impacts would be expected because of increased annual aircraft operations. No off-installation land would be impacted by the 65+ dBA DNLs. Two Fairchild AFB POIs would be expected to experience eight potentially sleep disturbing events per year and an increased number of outdoor speech interference events, while no change would be expected to the number of potentially sleep disturbing or speech interference events elsewhere in the vicinity of Fairchild AFB. Classroom learning interference would not be expected. No change to existing noise impacts on wildlife would be expected.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.
Biological Resources		
Short- and long-term, minor, adverse impacts on vegetation would occur due to temporary disturbance of vegetation and soil compaction during construction, demolition, and renovation and from permanent vegetation removal for new facilities and infrastructure. Because portions of the Project Area are already highly disturbed and are of low ecological value, these impacts would be negligible to minor. Short-term, minor, and long-term, negligible, adverse impacts on wildlife and special status species may occur from increased noise and potential displacement associated with construction, demolition, and renovation activities. Long-term, minor, adverse impacts on wildlife and special status species would occur from a slightly increased risk of BASH from the proposed approximately 15 percent increase in aircraft operations. No change to existing noise impacts on wildlife would be expected. No impacts on wetlands are anticipated because no wetlands occur within or proximal to the Project Area.	Short- and long-term, minor, adverse impacts on vegetation would occur due to temporary disturbance of vegetation and soil compaction during construction, demolition, and renovation and from permanent vegetation removal for new facilities and infrastructure. Because portions of the Project Area are already highly disturbed and are of low ecological value, these impacts would be negligible to minor. Short-term, minor, and long-term, negligible, adverse impacts on wildlife and special status species may occur from increased noise and potential displacement of wildlife due to actions associated with construction, demolition, and renovation. Long-term, negligible, adverse impacts from permanent habitat loss; and long-term, minor to moderate, adverse impacts from an anticipated increase in annual aircraft operations would occur on wildlife and special status species. No impacts on wetlands are anticipated because no wetlands occur within or proximal to the Project Area.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Cultural Resources		
Alternative 1 would require additions to Hangars 1–5, which would adversely affect the individual properties and the MacDill Field Historic District to which they contribute. Potential short-term impacts to historic properties under NEPA would include temporary atmospheric (visual, noise, and vibration) impacts from construction activities, and would be considered negligible. Potential long-term impacts to historic properties under NEPA include the renovation of historic properties and introduction of new buildings and structures within the MacDill Field Historic District. It is anticipated that the adverse effects on architectural resources under Section 106 that would result from Alternative 1 would be mitigated by implementation of the Memorandum of Agreement developed and signed by the DAF and Florida SHPO in June 2023. Therefore, the resulting long-term impacts would be reduced to moderate. No known archaeological resources, traditional cultural resources, or sacred sites are within the Project Area or have been identified through consultation with tribes. Therefore, no impacts on these resources would be anticipated.	Potential short-term impacts on historic properties under NEPA would include temporary atmospheric and auditory impacts from construction activities, and would be considered negligible. Potential long-term impacts to historic properties under NEPA include the renovation of one individually eligible historic property, Building 2050. Historic American Building Survey documentation of Building 2050 was completed to mitigate adverse effects under Section 106 for a previous action. Fairchild AFB emailed consultation materials, including a request for concurrence on the APE, finding of Adverse Effects to Building 2050, and the aforementioned approach for consultation, to the Washington SHPO on May 3, 2023 (**Appendix A**). As requested by the Washington SHPO during subsequent communications, Fairchild AFB submitted the consultation materials and requested records through the Washington SHPO's online portal, Washington Information System for Architectural and Archeological Records Data, on June 20, 2023. The WA SHPO responded with concurrence on the defined APE for the project on June 29, 2023 (**Appendix A**), while FAFB was continuing to provide requested materials. No further correspondence from SHPO was received on the project; therefore, concurrence with the approach for consultation was assumed. No impacts on archaeological or traditional resources would be anticipated under Alternative 2.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.
Socioeconomics		
Long-term, negligible, adverse impacts on population, housing, education, public services, and base services at MacDill AFB would occur due to an increase in installation personnel and associated dependents under Alternative 1. Long-term, negligible, beneficial impacts on economic activity would be expected because the net increase in personnel and dependents would increase economic activity (purchase of goods and services, tax revenue, etc.)	Long-term, negligible, adverse impacts on population, housing, education, public services, and base services at Fairchild AFB would occur due to an increase in installation personnel and associated dependents under Alternative 2. Long-term, negligible, beneficial impacts on economic activity would be expected because the net increase in personnel and dependents would increase economic activity (purchase of goods and services, tax revenue, etc.)	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
in the local community, providing direct and indirect economic benefits. Short-term, minor, beneficial, economic impacts would also be generated through local construction employment and project-related spending to support facility and infrastructure improvements.	in the local community, providing direct and indirect economic benefits. Short-term, minor, beneficial, economic impacts would also be generated through local construction employment and project-related spending to support facility and infrastructure improvements.	
Soils and Geology		
Long-term, negligible, adverse impacts would be expected on the natural topography from site preparation (i.e., grading, excavating, recontouring) and construction. No impacts on geology would be expected under Alternative 1. Short-term, negligible, adverse impacts on or from geologic hazards would be expected from an increased risk of sinkhole development during construction-related ground disturbance under Alternative 1. Short- and long-term, minor, adverse impacts on soils would be expected due to an increase in impervious surfaces and associated erosion, sedimentation, and ground disturbance.	Long-term, negligible, adverse impacts would be expected on the natural topography from site preparation (i.e., grading, excavating, recontouring) and construction. No impacts on geology would be expected under Alternative 2. Long-term, negligible, adverse impacts on or from geologic hazards would be expected from the risk of structural failure or damage to new or renovated facilities associated with seismic activity in the area. Short- and long-term, moderate, adverse impacts on soils would be expected due to an increase in impervious surfaces and associated erosion, sedimentation, and ground disturbance.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.
Water Resources		
Short-term, negligible to minor, adverse impacts on the surficial aquifer at MacDill AFB could occur due to the potential for intersection between construction and the surficial aquifer. A decrease in infiltration and increase in flow rate could intensify erosion and sedimentation from impervious surface runoff. BMPs to decrease sedimentation and soil erosion in runoff could include stabilized construction entrances, silt fencing, berms and swales, check dams, vegetated channels, basins and traps, outlet protection, erosion control blankets, and level spreaders. Alternative 1 could result in short- and long-term, minor, adverse impacts on surface water and water quality at MacDill AFB due to increased runoff and associated erosion and sedimentation as a result of construction, demolition, and renovation, and an increase in impervious surfaces under Alternative 1.	Short-term, negligible to minor, adverse impacts on groundwater resources could occur at Fairchild AFB as a result of increased demand for potable water and impacts on recharge rates due to increased impervious surfaces. Alternative 2 could result in short- and long-term, minor to moderate, adverse impacts on surface water at Fairchild AFB due to increased runoff and associated erosion and sedimentation as a result of construction, demolition, and renovation, and an increase in impervious surfaces under Alternative 2. No impact on floodplains would be anticipated because no floodplains occur in the Project Area.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Alternative 1 would result in long-term, minor, adverse impacts on the surrounding floodplains from an increase in runoff and erosion rate.		
Infrastructure and Transportation		
Short-term, negligible, adverse impacts on the potable water system, electrical system, natural gas system, the sanitary sewer and wastewater system, the stormwater system, and the communications system at MacDill AFB would be expected from temporary interruptions during construction, demolition, and renovation associated with Alternative 1. Long-term, negligible to minor, adverse impacts on the potable water supply system, electrical system, natural gas supply, and solid waste management at MacDill AFB would occur due to increased demand from the personnel increase and additional facility operations associated with Alternative 1. Short-term, negligible, adverse impacts on the liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required during construction, demolition, and renovation activities under Alternative 1. Long-term, negligible, adverse impacts on the liquid fuel system at MacDill AFB would be expected from increased annual aircraft operations associated with Alternative 1. Long-term, negligible, adverse impacts on the MacDill AFB stormwater system would be expected runoff from an increase in impervious surfaces associated with Alternative 1. Short-term, minor, adverse impacts on solid waste management would be expected from construction, demolition, and renovation activities under Alternative 1. Short-term, minor, adverse impacts on the airfield at MacDill AFB would be expected from operational disruptions during construction, demolition, and renovation. Long-term, minor, beneficial impacts on the airfield at MacDill AFB would occur from the addition of ramp space, expansion of facilities, and replacement of pavements.	Short-term, negligible, adverse impacts on the potable water system, electrical system, natural gas system, sanitary sewer and wastewater system, and communications system at Fairchild AFB would be expected from temporary interruptions during construction, demolition, and renovation associated with Alternative 2. Long-term, negligible to minor, adverse impacts on the potable water supply system, electrical system, natural gas supply, and solid waste management at Fairchild AFB would occur due to increased demand from the personnel increase and additional facility operations associated with Alternative 2. Short- and long-term, negligible to minor, adverse impacts on the liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required during construction, demolition, and renovation activities under Alternative 2 and from the 29 percent increase in annual aircraft operations at the installation, which would require greater quantities of jet fuel when compared with the existing demand. Long-term, minor, beneficial impacts on the liquid fuel system at Fairchild AFB would be expected from the facility and airfield improvement projects. Short- and long-term, negligible to moderate, adverse impacts on the Fairchild AFB stormwater system would be expected due to construction-related temporary disruptions and increased erosion, sedimentation, and runoff from an increase in impervious surfaces associated with Alternative 2. Short- and long-term, minor, adverse impacts on solid waste management would be expected from construction, demolition, and renovation activities and increased installation personnel under Alternative 2.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Short- and long-term, negligible to minor, adverse impacts on the regional and on-installation transportation, parking, and roadway networks would occur from increased traffic during construction, demolition, and renovation and daily operations and an increase in cars and commuters accessing the installation. The increase in traffic likely would not permanently increase traffic beyond the functionality of any regional roadway.	Short-term, minor, adverse impacts on the airfield at Fairchild AFB would be expected from operational disruptions during construction, demolition, and renovation. Long-term, minor, beneficial impacts on the airfield at Fairchild AFB would occur from the addition of ramp space, expansion of facilities, and replacement of pavements. Short- and long-term, negligible to minor, adverse impacts on the regional and on-installation transportation, parking, and roadway networks would occur from increased traffic during construction, demolition, and renovation and daily operations and an increase in cars and commuters accessing the installation. The increase in traffic likely would not permanently increase traffic beyond the functionality of any regional roadway.	
Land Use		
Alternative 1 would have short-term, negligible to minor, adverse impacts on installation land use from increased noise and potentially constrained access of nearby facilities due to construction, demolition, and renovation actions and requirements to temporarily fence areas for public safety. Long-term, minor, beneficial impacts on installation land use from more efficient use of land and decreased land area within NZs. No impacts from the proposed construction, demolition, nor renovation projects on off-installation land use would be expected because MacDill AFB has the physical real estate and infrastructure required for Alternative 1 and would not need land outside the installation boundaries. Long-term, minor, beneficial impacts would be expected due to the decrease in acres exposed to the 65-dBA DNL or greater contours because the KC-46A aircraft is generally quieter than the KC-135 aircraft. Alternative 1 would be consistent with the Florida Coastal Management Program.	Alternative 2 would have short- and long-term, negligible to minor, adverse impacts on installation land use from increased noise and potentially constrained access of nearby facilities due to construction, demolition, and renovation actions and requirements to temporarily fence areas for public safety. Long-term, minor, beneficial impacts on installation land use from more efficient use of land. Long-term, minor, adverse impacts would occur due to the proposed 29 percent increase in aircraft operations that would increase operational noise and expand the NZ area on the installation.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.
Hazardous Materials and Wastes		
Short-term, minor, adverse impacts would occur from the use of hazardous materials and petroleum products as well as the generation of hazardous wastes during the proposed construction, demolition, and renovation. Long-term,	Short- and long-term, minor, adverse impacts would occur from the use of hazardous materials and petroleum products as well as the generation of hazardous wastes during the proposed construction, demolition, and	No change from existing conditions at either installation.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
negligible, adverse impacts would occur from the slightly increased use of hazardous materials and petroleum products and generation of hazardous wastes due to the associated approximately 15 percent increase in annual aircraft operations under Alternative 1. Short-term, minor, adverse impacts from toxic substances would occur during facility demolition and renovation because these activities could disturb ACMs, LBP, and PCBs. Long-term, beneficial impacts would occur from reducing the potential for future human exposure to these toxic substances by reducing the amount of ACMs, LBP, and PCBs at MacDill AFB. Short-term, minor, adverse impacts would occur because some facility construction, demolition, and renovation locations are co-located with active ERP sites. No long-term impacts would occur from operations within the ERP sites because the implemented LUCs would be complied with and would not conflict with the operation of proposed facilities. Areas of PFAS are currently being investigated on MacDill AFB and are expected to occur throughout the Project Area. Therefore, short-term, minor, adverse impacts could occur from the ground-disturbing activities within the Project Area. No impacts on the use of the proposed facilities would be expected from PFAS because they have a low potential for vapor intrusion. Long-term, negligible, adverse impacts from radon are possible but unlikely due to construction and operation of new and renovated facilities under Alternative 1.	renovation, and from the increased use of hazardous materials and petroleum products and the generation of hazardous wastes due to the 29 percent increase in annual aircraft operations under Alternative 2. Short-term, minor, adverse impacts from toxic substances would occur during facility demolition and renovation because these activities could disturb ACMs, LBP, and PCBs. Long-term, beneficial impacts would occur from reducing the potential for future human exposure to these toxic substances by reducing the amount of ACMs, LBP, and PCBs at Fairchild AFB. Short-term, minor, adverse impacts would occur because some facility construction, demolition, and renovation locations are co-located with active ERP sites and an area of PFAS contamination. No long-term impacts would occur from operations within the ERP sites because the implemented LUCs would be complied with and would not conflict with the operation of proposed facilities. Additionally, no impacts on the use of the proposed facilities would be expected from PFAS because they have a low potential for vapor intrusion. Long-term, minor, adverse impacts from radon are possible due to construction and operation of new and renovated facilities under Alternative 2. Based on the USEPA rating of Radon Zone 1 for Spokane County, it is possible the new and renovated facilities could have indoor radon screening levels greater than 4 pCi/L.	Ongoing operations and other separately approved plans would continue.
Health and Safety		
No impacts on flight safety would be expected because no change would occur in the number of aircraft operating or the type of operations under Alternative 1. Long-term, negligible, adverse impacts would be expected from a slightly increased potential for bird/wildlife aircraft strikes associated with the proposed increase in operations under Alternative 1.	Long-term, negligible, adverse impacts on flight safety would be expected because of an increased risk of an incident due to increased annual aircraft operations under Alternative 2. Long-term, minor, adverse impacts would be expected due to the increased potential for bird/wildlife aircraft strikes	No change from existing conditions at either installation. Ongoing operations and other separately

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Short-term, negligible to minor, adverse impacts on occupational safety at MacDill AFB would be anticipated during construction from increased occupational hazards from vehicles, noise/dust, air emissions, construction zones, and detours.	associated with the proposed 29 percent increase in operations. Short-term, negligible to minor, adverse impacts on occupational safety at Fairchild AFB would be anticipated during construction from increased occupational hazards from vehicles, noise/dust, air emissions, construction zones, and detours.	approved plans would continue.
Air Quality		
Air emissions from construction activities under Alternative 1 would result in short-term, minor, adverse impacts on air quality. The air pollutant of greatest concern during construction is particulate matter, such as fugitive dust. Construction contractors would employ BMPs and environmental control measures, to the greatest extent applicable, to reduce impacts. Long-term, moderate, adverse, and minor, beneficial impacts on air quality would occur from Alternative 1. Air emissions would be directly produced from operation and heating and cooling of new facilities, KC-46A aircraft operations, and additional personnel at MacDill AFB, but would result in an annual net decrease of several pollutants. Air emissions produced during construction and operation of the new facilities would not meaningfully contribute to the potential effects of global climate change and would not increase the total CO_2e emissions produced by Hillsborough County.	Air emissions from construction activities under Alternative 2 would result in short-term, minor, adverse impacts on air quality. The air pollutant of greatest concern during construction is particulate matter, such as fugitive dust. Construction contractors would employ BMPs and environmental control measures, to the greatest extent applicable, to reduce impacts. Long-term, moderate, adverse, and minor, beneficial impacts on air quality would occur under Alternative 2. Air emissions would be directly produced from operation and heating of new facilities, KC-46A aircraft operations, and additional personnel at Fairchild AFB, but would result in an annual net decrease of two pollutants. Air emissions produced during construction and operation of the new facilities would not meaningfully contribute to the potential effects of global climate change and would not increase the total CO_2e emissions produced by Spokane County.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.
Environmental Justice and Other Sensitive Receptors		
Short-term, negligible, adverse impacts on environmental justice or sensitive receptor populations could occur from increased noise and actions associated with construction, demolition, and renovation under Alternative 1. These impacts would be distributed evenly across the surrounding area and would not be disproportionate on any populations, including minority and low-income populations; nor would exposure of children and elderly persons to environmental health risks or safety risks be increased.	Short-term, negligible, adverse impacts on environmental justice or sensitive receptor populations could occur from increased noise and actions associated with construction, demolition, and renovation under Alternative 2. These impacts would be distributed evenly across the surrounding area and would not be disproportionate on any populations, including minority and low-income populations; nor would exposure of children and elderly persons to environmental health risks or safety risks be increased.	No change from existing conditions at either installation. Ongoing operations and other separately approved plans would continue.

Alternative 1 (Preferred Alternative) – MacDill AFB, FL	Alternative 2 – Fairchild AFB, WA	No Action Alternative
Long-term, negligible, beneficial impacts would be expected due to the decrease in acres exposed to the 65-dBA DNL or greater contours. No long-term, disproportionate impacts on environmental justice populations and other sensitive receptors would be expected from Alternative 1.	No long-term, disproportionate impacts on environmental justice populations and other sensitive receptors would be expected from Alternative 2.	

Key: AFB = Air Force Base; BASH = Bird/Wildlife Aircraft Strike Hazard; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; SHPO = State Historic Preservation Office; MOA = Memorandum of Agreement; EIS = Environmental Impact Statement; NZ = noise zone; BMP = best management practice; ACM = asbestos-containing materials; LBP = lead-based paint; PCB = polychlorinated biphenyl; ERP = Environmental Restoration Program; LUC = Land Use Control; CO_2e = carbon dioxide equivalent; dBA = "A"-weighted decibel; DNL = day-night average sound; PFAS = per- and polyfluoroalkyl substances; USEPA = United States Environmental Protection Agency; POI = point of interest; pCi/L = picocuries per liter

FINAL

ENVIRONMENTAL IMPACT STATEMENT
FOR
KC-46A MAIN OPERATING BASE #6 (MOB 6)
BEDDOWN

U.S. DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR MOBILITY COMMAND

NOVEMBER 2023

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1 Purpose of and Need for the Proposed Action

1.1 Introduction

The U.S. Department of the Air Force (DAF) proposes the continuation of ongoing efforts to recapitalize (replace and restructure) portions of the existing fleet of 1950s-era aerial refueling tankers (KC-135 Stratotanker [KC-135]) through the Main Operating Base (MOB) beddown of the modern KC-46A Pegasus (KC-46A). The KC-46A, the newest aerial refueling aircraft in the DAF fleet, provides expanded operational capabilities to receive fuel from other tankers, enables multi-point refueling to support aerial refueling efficiency, adds night vision and defensive systems, and provides an optimized command and control function compared with the existing tanker fleet.

Since 2006, efforts to recapitalize tanker aircraft have occurred as a phased progression to integrate a total of 179 modern aerial refueling tankers into the Total Aircraft Inventory at DAF installations by 2029. In 2011, following several years of heavily contested bids to produce a new tanker aircraft, the KC-46A aircraft was selected for production, and a phased strategic basing plan for the new tanker program was begun. Each basing phase has been completed in accordance with the National Environmental Policy Act ([NEPA]; 40 Code of Federal Regulations [CFR] Parts 1500–1508); the DAF procedures for implementing NEPA (32 CFR Part 989, *Environmental Impact Analysis Process [EIAP]*); and the Air Force Instruction (AFI) 10-503, *Strategic Basing*, which outlines requirements for siting and implementing a beddown action.

The Air Mobility Command (AMC) is the lead command responsible for maintaining the DAF's air mobility mission, including command and control of airlift and aerial refueling. The goal of KC-46A basing and fielding is to continue to provide optimum combatant commander support, and to efficiently meet regional and global receiver demands while replacing existing KC-135s. Consistent with the prior recapitalization efforts, if an installation that has an existing tanker mission is selected for the Main Operating Base #6 (MOB 6) mission, the existing KC-135 aircraft would be either relocated to another installation or retired out of the DAF inventory, depending on the age and maintenance status of each aircraft.

Since 2014, the DAF has prepared separate Environmental Impact Statements (EIS) and issued corresponding Records of Decision for the KC-46A Formal Training Unit and MOB 1 (DAF 2014a), MOB 2 (DAF 2014b), MOB 3 (DAF 2017a), and MOB 4 (DAF 2018a) missions. Respectively, these DAF actions replaced aged tanker aircraft with KC-46A aircraft at active duty, Air National Guard (ANG), and Air Force Reserve Command (AFRC) Air Force Bases (AFB) in Oklahoma, Kansas, New Hampshire, North Carolina, New Jersey, and California. An EIS to address the MOB 5 mission is currently being developed.

This EIS addresses DAF's MOB 6 mission to beddown two squadrons of 12 KC-46A Primary Aerospace Vehicle Authorization (PAA), and the supporting base facilities, infrastructure, and workforce at one active duty Continental United States (CONUS) AMC AFB between fiscal year (FY) 2026 and FY 2028. MacDill AFB in Florida (Alternative 1 – Preferred Alternative) and Fairchild AFB in Washington State (Alternative 2) are the only AMC active duty installations that

are operating KC-135 aircraft that support aerial refueling mission operations and have the capacity to support the KC-46A MOB 6 beddown. Following AFI 10-503 guidance, these two AFBs were identified as the reasonable location alternatives for implementing the MOB 6 beddown (see **Figure 1-1**).

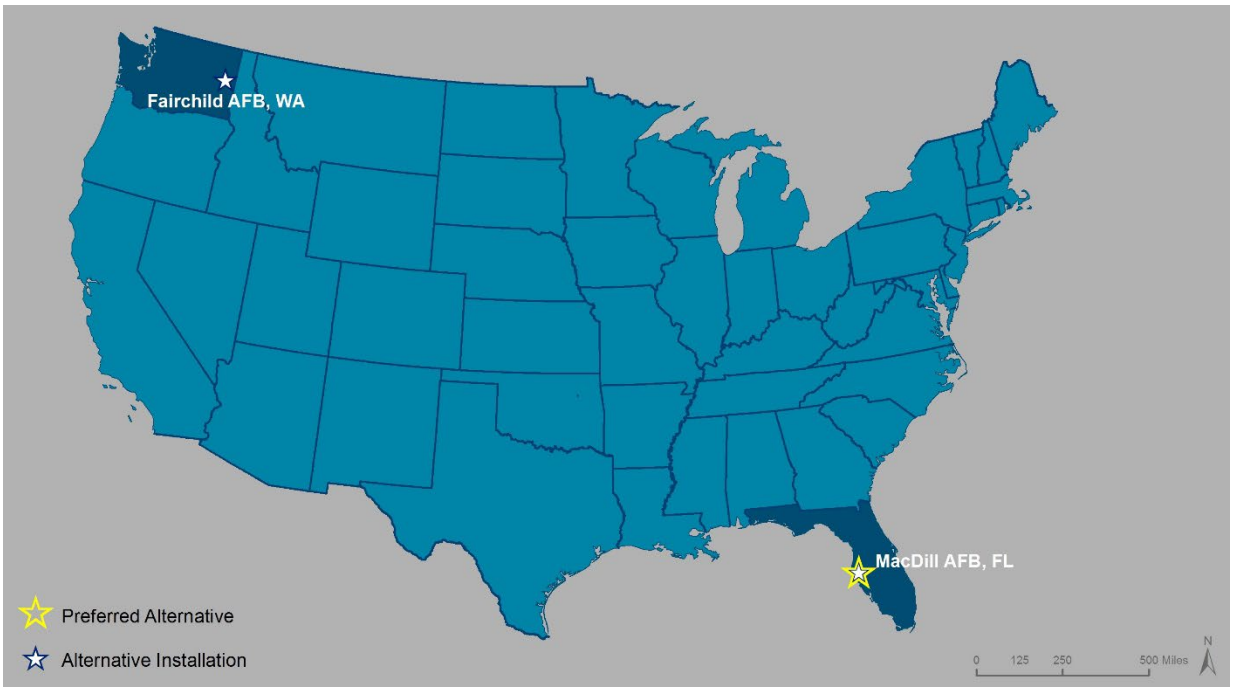

Figure 1-1. Reasonable Alternative Basing Locations for the KC-46A MOB 6 Beddown

DAF's KC-46A MOB 6 beddown follows the Total Force Integration (TFI) concept that was enacted into law through the passage of the 2008 National Defense Authorization Act, which pairs two DAF component units (host and associate) together to operate as one. TFI supports DAF transformation by developing, promoting, and implementing new and creative organizational constructs and by advocating changes in personnel policy that enhance the integration of active, reserve, and civilian work forces. Currently, three types of TFI associations occur: classic, active, and air reserve component. Per AFI 90-1001, *Total Force Associations,* classic associations pair active duty host units with an air reserve component associate or ANG unit as tasked to improve operational synergies and add capacity during surge operations at a reduced cost.

The KC-46A MOB 6 beddown would use the TFI classic association of crews, whether the association is with an ANG or AFRC unit. AMC would operate the MOB 6 mission with fully trained combat aircrews, providing aerial refueling and mission support for regional conflicts, conventional global strike, and nuclear deterrence operations.

1.2 Background

In April 2006, the DAF completed an Analysis of Alternatives to determine the most appropriate strategy to recapitalize portions of the existing aging tanker aircraft fleet. Based on that analysis, the DAF concluded that a commercial derivative replacement tanker would result in the best

value. Congressional authority funded the total purchase of 179 KC-46A aircraft by 2028 to modernize the fleet, enhance operations, and increase mission effectiveness (CRS 2020). Most of the total aircraft inventory is being assigned to combat units but operated by units assigned to AMC, ANG, and AFRC.

1.2.1 Purpose

The purpose of the Proposed Action is to recapitalize aging tanker aircraft with the KC-46A model to better address current and future mission requirements, offer expanded capability, and provide life-cycle cost savings in comparison to continued operation of existing KC-135 aircraft.

1.2.2 Need

The MOB 6 beddown of the KC-46A is needed because the KC-46A would provide mission essential capabilities currently lacking in the existing tanker fleet, including receiver capability, night vision imaging system, multi-point refueling, command and control network, and defensive protection.

1.3 KC-46A Information

This section compares the aircraft characteristics of the existing KC-135 and KC-46A. Key specifications of the KC-135 and KC-46A are presented in **Table 1-1**.

Table 1-1. Comparison of KC-135 and KC-46A

Specification	KC-135	KC-46A
Length	136 feet, 3 inches	165 feet, 6 inches
Height	41 feet, 8 inches	52 feet, 10 inches
Wingspan	130 feet, 10 inches	156 feet, 1 inch
Power Plant	4 F108-CF-100	2 Pratt & Whitney 4062
Takeoff Thrust	21,634 pounds per engine	62,000 pounds per engine
Speed	530 miles per hour at 30,000 feet	530 miles per hour at 30,000 feet
Ceiling	50,000 feet	40,100 feet
Maximum Takeoff Weight	322,500 pounds	415,000 pounds
Maximum Fuel Capacity	200,000 pounds	212,000 pounds
Pallets/Palletized Cargo Weight Capacity	6/36,000 pounds	18/65,000 pounds
Crew	3 crewmembers	3 crewmembers
Receiver Fuel Transfer	Very limited	Yes
Fuel Jettison	Yes	Yes
Night Vision Imaging System	No	Yes
Multi-Point Refueling	Very limited	Yes
Command and Control Network	No	Yes
Defensive Protection	Very limited	Yes
Aeromedical Evacuation	Limited	Yes

1.3.1 KC-46A Aircraft Characteristics

The KC-46A is derived from a commercial Boeing 767-200ER series aircraft and is powered by two Pratt & Whitney 4062 engines (without thrust reversers). Each engine has the capability to provide approximately 62,000 pounds of thrust. The KC-46A configuration adds the military equipment (e.g., aerial refueling, defensive systems, situational awareness) and will receive a Federal Aviation Administration (FAA) Supplemental Type Certificate as well as a DAF Military Type Certificate. It is required to meet the FAA Part 36 Stage 4 noise standards (the most restrictive commercial aircraft noise standards) and the International Civil Aviation Organization's Committee on Aviation Environmental Protection (CAEP)/6 air contaminant emission limits. The International Civil Aviation Organization regulatory limits are referred to by the corresponding Committee on Aviation Environmental Protection meeting number (e.g., CAEP/2, CAEP/4, CAEP/6, and CAEP/8). Three crewmembers (pilot, copilot, and BO) would operate the aircraft, which has permanent seating for an additional 12 aircrew members.

With new technology and a maximum fuel capacity of approximately 212,000 pounds, the KC-46A is capable of accomplishing all current AMC refueling missions. The KC-46A can refuel any certified fixed-wing, receiver-capable aircraft on any mission both day and night.

The aircraft is equipped with a modernized refueling boom integrated with a proven fly-by-wire control system and will have the ability to deliver fuel through a centerline hose and drogue system, which adds additional mission capability independent of the boom system.

This aircraft is capable of accomplishing multi-role missions. By trading fuel for cargo, it can carry up to 18 standard cargo pallets, with a total palletized cargo payload of up to 65,000 pounds. KC-46A centerline pallet positions 1 through 8 can be built to carry full-height (96-inch-high) cargo without the need for contouring. In normal operations, the KC-46A can be configured to carry 58 passengers and can provide urgent aeromedical evacuation, transporting up to 50 medical patients (24 in litters and 26 ambulatory). A litter is a rescue basket or stretcher that can be affixed to and carried by an aircraft. Patients who are ambulatory may or may not require use of a stretcher.

Additional features include a flush-mounted, air refueling receptacle, wing air refueling pods, boom air refueling camera and computer control systems, defensive and communication systems, night vision imaging system/covert lighting, and military radio/navigation receivers. The BO can control the refueling systems from the crew compartment via the Air Refueling Operator Station. A series of cameras mounted on the tanker's fuselage provide a 185-degree field of view under day and night lighting conditions. Imaging may be captured in three- or two-dimensional high-definition video. Fuel is automatically transferred within the aircraft to maintain center of gravity in all axes. The flow of fuel in, out, and within the aircraft either can be automatically controlled by the aircraft or manually controlled by the aircrew via control display units at the appropriate duty station.

In addition to fuel and cargo transport, each KC-46A aircraft possesses a secure airborne communications capability, which provides the KC-46A with the most current command and control systems. The KC-46A can also support the command and control core function as a communications "gateway" when equipped with a roll-on gateway system to provide connectivity between tactical network partners in theater.

The KC-46A is equipped with self-defense and protection (both active and passive) capabilities and the necessary operational environment awareness to mitigate threats but will not be operated in areas of high threats without requesting suppression of enemy air defenses and air support.

This aircraft is capable of ferrying fuel into semi-austere airfields. By following Forward Area Refueling Point procedures, the aircraft can offload fuel into fuel pits, bladders, trucks, or other aircraft, with or without the engines running, without the need for special equipment. The aircraft can operate at certain night vision goggle and/or defensive system-required airfields with a minimum of 7,000 feet of paved runway available for takeoff and landing.

The aircraft is capable of operating in day-night and adverse weather conditions over vast distances to enable deployment, employment, sustainment, and redeployment of U.S., joint, allied, and coalition forces.

1.3.2 KC-135 Aircraft Characteristics

The KC-135 was developed in 1954 as DAF's first jet-powered refueling tanker to replace the KC-97 Stratotanker and is derived from a commercial Boeing 367-80 commercial passenger plane. The KC-135 was originally developed to refuel strategic bombers and was used in the Vietnam War and in all conflicts up to and including Operation Inherent Resolve in Syria and

Iraq in 2018. In this document, all KC-135 models, including the current R model, are referred to as the KC-135.

Originally, all KC-135s were equipped with four Pratt & Whitney J-57-P-59W turbojet engines, each capable of producing approximately 13,000 pounds of thrust. The current R models were upgraded to use the CFM56-2B1 (military designation F108-CF-100) turbofan engines, which can generate approximately 21,634 pounds of thrust per engine. The KC-135 has a maximum takeoff weight of more than 322,500 pounds and the ability to offload up to 200,000 pounds of fuel. Additionally, the KC-135 can transport up to 36,000 pounds of palletized cargo and/or ambulatory patients during aeromedical evacuations. A cargo deck above the refueling system can hold a mixed load of passengers and cargo depending on the fuel storage configuration. The KC-135 pumps fuel through the flying boom, but some aircraft have been specially fitted with wing pods to allow a multi-point aerial refueling drogue system. As noted previously in **Table 1-1**, the aircraft has limited capability for receiver fuel transfer, defense protection, or command and control capabilities and has no night vision imaging system.

1.4 Interagency and Public Involvement

Compliance with EIAP and Council on Environmental Quality (CEQ) NEPA regulations requires several steps to ensure agency and public involvement in the process. Additionally, the Intergovernmental Coordination Act and Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, require federal agencies to cooperate with and consider state and local views in implementing a federal proposal.

1.4.1 Public Involvement

1.4.1.1 Public Scoping

A 30-day public scoping period for the KC-46A MOB 6 EIS began on April 14, 2022, with publication of the Notice of Intent (NOI) in the *Federal Register*. Concurrent with the publication of the NOI, the DAF sent notification letters to federal, state, and local agencies; elected officials; federally recognized tribes (see **Section 1.4.2**); nongovernmental organizations; and interested individuals. Newspaper notices announcing the intent to prepare an EIS were published in four daily and weekly newspapers local to the MacDill AFB and Fairchild AFB communities.

Public scoping was conducted via the project website (www.kc46amob6eis.com), which provided posters, a presentation, an informational brochure, other meeting materials, downloadable comment forms, and a capability for the public to provide public scoping comments online. Hard copies of scoping materials were also provided to local libraries for the public. The scoping period closed on May 16, 2022.

During the scoping period, the DAF was made aware that one of the local libraries in the Fairchild AFB area that was in receipt of hard copies of scoping materials for the project was undergoing renovations and was therefore operating out of an alternate location. While those hard copy scoping materials were made available at the alternate library location, newspaper advertisements did not specify the alternate location. Therefore, to ensure the public had sufficient time to access and review the public scoping materials and provide comments, the

DAF extended the scoping period by an additional 30 days. The extended scoping period ended on June 30, 2022. Notices of the extended scoping period and the alternate library location were published in the two newspapers local to the Fairchild AFB communities and on the project website. Requests were sent to all the libraries to ensure the hard copy scoping materials were made available to the public for the additional 30 days.

Appendix A provides the notification mailing list for federal, state, and local agencies; elected officials; nongovernmental organizations; and interested individuals, and the list of local libraries. All scoping materials were made available for viewing and download from the project website for the duration of the EIS effort.

Concurrent with the public scoping process, the DAF provided early public notice in the NOI and newspaper advertisements of the potential for floodplain impacts. These early notifications were provided in accordance with the requirements and objectives of EO 11988, *Floodplain Management*. Implementation of the Proposed Action at MacDill AFB would have the potential to be located in a floodplain, as identified in the early notification included in the newspaper ads.

In total, 26 comment correspondences were received during the public scoping period, including 3 from federal agencies, 1 from a state agency, 2 from local agencies, 2 from Native American Tribes, and 18 from private citizens. Comments received varied from showing support for or against the MOB 6 Beddown at either MacDill AFB or Fairchild AFB, requesting more information about or providing comments on the scoping process, and focusing on the following topics:

- Concerns were raised over potential disruptions for wildlife, wetlands, and other surface waters at MacDill AFB
- Recommendation to implement an inadvertent discovery plan of action for the project at Fairchild AFB
- Concerns raised regarding historic contamination of groundwater at Fairchild AFB, potential depletion of the aquifer in the Tampa Bay area, concern over sea level rise and flooding at MacDill AFB, inclusion of stormwater controls in Proposed Action, and identification of permitting required for aircraft washing
- Concerns regarding noise impacts resulting in public disruption due to aircraft noise and mitigations that may be incorporated to minimize effects, and impacts on environmental justice and other sensitive receptors, including child and elderly populations
- Concerns regarding infrastructure and transportation, including historic contamination of drinking water supply at Fairchild AFB, potential depletion of the aquifer in the Tampa Bay area, concern over the stability of a runway built at MacDill AFB and need for a completely flat/level runway, added traffic congestion, potential airfield operations disruptions, location of snow dump areas (at Fairchild AFB) and airfield pavement, and inclusion of sustainable building practices and renewable energy
- Concern over housing demand from increased personnel, inflation, and increased demand for childcare at Fairchild AFB

- Concerns regarding potential public health impacts from use of per- and polyfluoroalkyl substances (PFAS) and perfluorooctyl sulfonate as fire suppression, Superfund sites, and transport of hazardous materials at Fairchild AFB; inclusion of secondary containment for all petroleum, oil, and lubricants; and identification of need for permits for storage tanks
- Concerns regarding climate change, air emissions, and air pollution, and identification of necessary permits at Fairchild AFB

1.4.1.2 Draft EIS Public Review Period

The Draft EIS 45-day public comment period began on February 10, 2023 with publication of the Notice of Availability (NOA) in the *Federal Register,* and ended on March 27, 2023. The NOA for the Draft EIS and Notice of Public Hearings was also published in local newspapers distributed near each installation alternative. Concurrent with the publication of the NOA, the DAF sent notification letters to federal, state, and local agencies; elected officials; nongovernmental organizations; and interested individuals that included information about the Draft EIS review period and public hearings.

The Draft EIS was made available via the project website (www.kc46amob6eis.com) and at local libraries (see **Appendix A**). Public hearing materials, including a PDF of the hearing presentation, an informational flyer, public hearing process instructions, and a comment form, were also made available via the project website and provided to local libraries. Two virtual public hearings were conducted via the Webex platform for the MacDill AFB and Fairchild AFB communities on 7 and 9 March 2023, respectively, from 5:30 p.m. to 8 p.m. local time. No verbal comments were made during the virtual public hearings.

During the Draft EIS public comment period, written public comments were submitted to DAF via the project website. Substantive comments included concerns regarding:

- Climate change mitigation
- Meaningful engagement with communities, including communities with environmental justice concerns
- Proximity to, and potential impacts, on waters of the United States (WOTUS)
- Protection of surface waters from petroleum, oil, and lubricants (POLs)
- Resource Conservation and Recovery Act (RCRA)-related solid waste generation disposal
- Implementation of United States Fish and Wildlife Service (USFWS)-recommended conservation measures
- Prioritization of recycling recyclable materials and use of renewable energy

Six substantive comments were received from the USEPA, four non-substantive comments were received from state and local agencies, and one non-substantive comment was received from a private citizen. The comments received and DAF responses to address comments are included in **Appendix A**.

During the public comment period, the FAA, with whom the DAF had previously been engaged during the scoping period, requested to be a participating agency for the KC-46A MOB 6 Beddown NEPA process.

1.4.2 Tribal Consultation

As part of the NEPA scoping process, letters were sent to federally recognized tribes notifying them of the intent to prepare an EIS and conduct public scoping, inviting them to review and provide comments on the Proposed Action as part of government-to-government consultation, and initiating National Historic Preservation Act (NHPA) Section 106 consultation (see **Appendix A**). Explanation of the Section 106 consultation will be provided for each alternative location in the respective Cultural Resources sections in Chapter 3 of the EIS (**Sections 3.3.3** and **3.4.3**).

Following standard DAF practice, consultation was initiated by installation wing commanders or tribal liaison officers as designated representatives per DAF Instruction 90-2002, *Interactions with Federally Recognized Tribes,* who represent key leadership points of contact for formal government-to-government consultation. Throughout the EIS process, additional direct communication efforts (telephone calls and emails) have occurred and will continue to occur to tribes that have been unresponsive to official project consultation invitations from the installation wing commander or installation tribal liaison officer. All communications with tribes were and will be completed in accordance with Department of Defense (DoD) Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes*; and 36 CFR Part 800, *Protection of Historic Properties*.

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2 Description of the Proposed Action and Alternatives

This section describes the Proposed Action and alternatives under consideration to fulfill DAF's purpose of and need for action. The NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, as defined in **Section 1.2**. Additionally, CEQ NEPA regulations specify the inclusion of a No Action Alternative against which potential impacts can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail.

2.1 Proposed Action

The Proposed Action would base 24 KC-46A aircraft in two squadrons of 12 PAA at an active duty, CONUS location for the KC-46A MOB 6 beddown. Each squadron would require infrastructure, facilities, airfield operations, training activities, personnel, and airspace to support the KC-46A MOB 6 beddown. The KC-46A MOB 6 beddown would occur in two stages: beddown and operations. The beddown stage would involve construction/retrofit of required facilities, infrastructure, and prepared surfaces, which includes renovation, alteration, and demolition. The beddown stage would also include preparing support facilities for new personnel and students to support the mission. The operational stage would involve conducting day-to-day activities (e.g., operational missions, maintenance) at the installation, including flight operations and training in the existing regional airspace.

Key elements associated with the KC-46A MOB 6 beddown under the Proposed Action with the potential to affect environmental resources at the installation(s) or under the training airspace include the following:

- Beddown 24 KC-46A aircraft in accordance with the aircraft delivery schedule (first arrival anticipated in FY 2026; last arrival anticipated in FY 2028)
- Renovate, construct, and manage existing and new facilities and infrastructure necessary to support the mission
- Increase personnel at the installation to conform to mission requirements
- Depending on the mission, conduct sorties (i.e., flight operations that include a takeoff and landing) at each installation for pilot, copilot, and boom operator training (BOT) and certification; aerial refueling operations; and global reach missions

The following sections identify the beddown and operational requirements for the Proposed Action at either installation.

2.1.1 Facilities and Infrastructure

The installation allocation and physical requirements necessary to support 24 KC-46A PAA and associated personnel are as follows:

- Three general maintenance hangars, which function primarily as inspection hangars and secondarily as repair hangars.
- One fuel cell hangar, which is used to remove, repair, and replace fuel cell tanks from aircraft.

- One corrosion control hangar, which includes a self-contained paint booth for touch-ups and would also function as a wash rack.
- Two Squadron Operations (Squad Ops) facilities and two Aircraft Maintenance Unit (AMU) facilities, which are typically combined in a two-story facility, with the AMU on the first floor (home base for technicians and administrative functions for the flightline) and office space for command, administration, mission planning, briefing, and support on the second floor.
- One Flight Training Center, consisting of:
    - Two Weapon System Trainers
    - Two Boom Operator Trainers
    - One or two Pilot Part Task Trainers
    - An adjoined or adjacent classroom
    - Office Space
- One Fuselage Training (FUT) Facility, consisting of:
    - Administrative and academic space
    - One FUT bay
    - One FUT associated cargo yard
- One Maintenance Training Facility
- Mission planning center
- Supply warehousing, flightline support facility, and aircraft parts storage
- Aerospace Ground Equipment (AGE) storage and parking
- Crash recovery shop with adequate vehicle parking
- Alternate Mission Equipment (AME) storage and maintenance facility (e.g., pallets)
- Runway that is minimally 7,000 feet long by 147 feet wide with a weight-bearing capability of 415,000 pounds
- 15 taxi on/off aircraft parking spots with fuel pits and a Type III fuel hydrant system on the parking ramp
- Radar approach control, instrument landing system, tactical air navigation system, and navigational aids that can support the KC-46A
- Appropriate fuel supply to support up to 240,000 gallons of jet fuel per day from commercial sources, storage facilities with up to 1.2 million gallons of capacity, and distribution systems
- A variety of shop areas (e.g., welding, hydraulics, composite repair, sheet metal) required for the mission
- Dormitories for all unaccompanied enlisted students and for permanently assigned, unmarried, first-term Airmen
- Adequate childcare, medical, fitness center, and other base operating support/force support

2.1.2 Personnel

The KC-46A MOB 6 beddown requires basing of sufficient personnel to operate and maintain the aircraft and to provide necessary support services, including active duty and AFRC enlisted, officer, DoD civilian, contractor support, and base operating support personnel. Depending on the number and types of personnel at each installation associated with the current missions,

and on the proposed ANG or AFRC component of the MOB 6 beddown, between 1,000 and 2,000 full-time and part-time personnel would be required to support 24 PAA. This includes active duty and ANG or AFRC enlisted, officer, DoD civilian, contractor support, and base operating support personnel. The dependents or family members of full-time military personnel are also included in the analysis. Family members and dependents were estimated at 2.5 times 65 percent of the full-time military personnel. School-age dependents of full-time military personnel were estimated at 1.5 times 65 percent of full-time military personnel (DAF 2021d).

2.1.3 KC-46A Operations

KC-46A aircrews would complete operational sorties as part of their global reach missions as well as local training sorties to maintain proficiency in the aircraft.

Training requirements for the KC-46A aircraft are detailed in Air Force Manual (AFMAN) 11-2KC-46 Volume I, *KC-46A Aircrew Training*, including the minimum semi-annual and annual flight training requirements to qualify and maintain proficiency and currency (allowing for unsupervised flight) for the KC-46A, for each flight crew member.

Flight training, including air refueling and training in the flight simulator, provides basic and continuation aircrew training needs. A typical KC-46A proficiency training sortie is similar to a KC-135 training sortie and includes a departure from the installation, climb to altitude for air refueling training in appropriate airspace, and return to the home installation for additional closed pattern training before landing for the sortie termination.

Proficiency training sorties to fulfill the requirements of AFMAN 11-2KC-46 Volume I typically depart from and return to the home installation on the same day. A global reach mission, however, typically departs the home installation, returns on a later day, and accomplishes training as a by-product of the operational mission. Although some in-flight training and certification occurs during proficiency training and global reach missions, the majority of KC-46A system continuation training would be completed in simulators.

2.2 Selection of Site Alternatives

Identification and analysis of alternatives is one of the core elements of the EIAP. Guidance for complying with NEPA requires an assessment of potentially effective and reasonably feasible alternatives for implementing the Proposed Action. Consideration of alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve a purpose. To warrant detailed evaluation in this EIS, an alternative must be reasonable. Reasonable alternatives are those that are practical or feasible from a technical and economic standpoint and use common sense, rather than simply being desirable from the standpoint of the applicant. To be reasonable, an alternative must meet the purpose of and need for the action, be feasible and able to be implemented, and be suitable for consideration by decision makers.

The DAF may expressly eliminate alternatives from detailed analysis based on reasonable selection standards per EIAP (32 CFR Part 989.8[c]). This section describes the DAF Strategic Basing Process outlined in AFI 10-503, and the application of this process to identify site alternatives for the KC-46A MOB 6 beddown locations. The process applied operational and other criteria to identify reasonable alternatives for the beddown of the KC-46A MOB 6 mission.

The Strategic Basing Process guides the identification and selection of locations to beddown DAF missions so that they are optimally aligned within the DAF's existing mission and organizational structure. For MOB 6, the DAF conducted a preliminary review of all CONUS installations to identify which among them would best align with the KC-46A mission. Top candidates for the beddown are AMC active duty-led; have an existing aerial refueling mission using the KC-135 aircraft and have not been previously selected to host the KC-46A mission; have a runway that is minimally 7,000 feet long; and have the existing infrastructure, facilities, and operational capacity to reasonably support the KC-46A MOB 6 beddown. Those DAF installations that did not meet these initial criteria were not considered further as reasonable options in the strategic basing screening effort.

Viability of the candidate locations as reasonable action alternatives under NEPA was then quantitatively assessed during subsequent screening against the following criteria for the MOB 6 beddown:

- *Mission criteria:* Existing refueling mission and proximity to refueling receiver demand, airfield and airspace availability, and fuel system capabilities
- *Capacity criteria:* Hangar capacity; runway length and bearing capacity; ramp space; base operation support capacity; Squad Ops facilities with AMUs; aircrew, maintenance, and FUT capabilities; and communications infrastructure
- *Environmental criteria:* Potential for conformity with the State Implementation Plan, local community's adoption of zoning or other land use controls (LUCs) to reduce encroachment and preserve the installation's flying operations, waivers, or absence of incompatible development in the clear zone (CZ) and/or accident potential zone (APZ), and known incompatible development within noise contours above 65 A-weighted decibel (dBA) day-night average sound levels (DNL)
- *Cost factor criteria:* Because of budgetary constraints, area construction factors based on the *DoD Facilities Pricing Guide* (Unified Facilities Criteria [UFC] 3-701-01 with Change 9, August 2021) and area locality cost factors

In addition to the quantitative screening assessment, the Secretary of the Air Force also considered qualitative operational factors in determining the candidate installations for the KC-46A MOB 6 beddown. The qualitative operational factors, also known as military judgment factors, included the following:

- Plans and guidance
- Global and regional coverage
- Combatant commander support
- Total force
- Beddown timing
- Force structure
- Training requirements and efficiencies
- Logistic supportability
- Resources and budgeting

After completion of the enterprise selection, initial quantitative screening against the selection standards, and consideration of the qualitative judgment factors, the Strategic Basing Process identified only the following two reasonable alternative locations for the MOB 6 beddown:

- Alternative 1 (Preferred Alternative) – MacDill AFB, Florida
- Alternative 2 – Fairchild AFB, Washington

At these locations, 24 KC-46A aircraft would replace KC-135 aircraft on a one-to-one ratio. Under Alternative 1 at MacDill AFB, all KC-135 aircraft would be replaced, and the KC-46A mission would entirely replace the existing tanker mission. Under Alternative 2 at Fairchild AFB, half of the existing KC-135 fleet would be replaced, and the KC-46A mission would be additive to the ongoing KC-135 mission at that installation.

2.3 Alternatives Carried Forward for Analysis

The DAF's evaluation of its CONUS installations against the selection criteria identified MacDill AFB and Fairchild AFB as the only reasonable installation alternatives to support the MOB 6 beddown. Alternative 1 (Preferred Alternative) – MacDill AFB and Alternative 2 – Fairchild AFB meet all selection criteria presented in **Section 2.2** because they are AMC active duty-led installations within the CONUS; currently support an aerial refueling mission training program and host active duty KC-135s; have not previously been selected to receive a KC-46A mission; and have available space and satisfactory infrastructure to accommodate the additional aircraft, personnel, and maintenance activities. No other active duty AMC AFBs were identified that meet the purpose and need for the Proposed Action. Therefore, only Alternative 1 (Preferred Alternative) at MacDill AFB and Alternative 2 at Fairchild AFB have been carried forward for detailed evaluation in this EIS, in addition to the No Action Alternative.

2.3.1 Alternative 1 (Preferred Alternative) – MacDill AFB

2.3.1.1 Aircraft Beddown

Under Alternative 1, the 24 KC-135 PAA at MacDill AFB would be replaced by 24 KC-46A PAA, resulting in no net change of PAA supporting the aerial refueling missions. KC-135 missions at MacDill AFB would be replaced with KC-46A missions over the transition period of approximately 2 years. Concurrent with the beddown of the 24 KC-46A PAA, the replaced existing 24 KC-135 aircraft would be either relocated to other installations or retired out of the DAF inventory, depending on the life-cycle status of each particular aircraft.

2.3.1.2 Facilities and Infrastructure

MacDill AFB has the physical real estate and infrastructure available to beddown 24 KC-46A PAA. Because MacDill AFB already supports the KC-135 aerial refueling tanker mission, the installation has existing facilities, airfield ramp, and hangars that could support the incoming KC-46A mission and operations.

Approximately 93 percent of the land area at the installation is located within the 100-year floodplain, including the areas around the flight line where most of the facilities and infrastructure required for the Proposed Action already exist. Minimal new construction along the flight line would be required because the existing facilities could be used with only minor to moderate modifications or additions to support the incoming replacement tanker mission. Use of the existing facilities would be phased to allow construction in support of the 24 KC-46A PAA. The new facilities must be constructed and operated along the flight line to provide for collocation/consolidation of mission capabilities; therefore, there would be no other practicable option for siting and developing the buildings outside of a floodplain. Facilities and infrastructure developed within the floodplain would be constructed and operated in accordance with the EO 11988 and the sustained compliance actions for water resources listed in **Section 2.6**.

The facility and infrastructure construction, demolition, renovation, and addition projects required to beddown 24 KC-46A PAA for the MOB 6 mission at MacDill AFB are listed in **Table 2-1**. The proposed redevelopment would take place within the developed cantonment area of MacDill AFB, as shown in **Figure 2-1**.

Most of the projects proposed at MacDill AFB involve modification of existing facilities that would continue to function and support uses consistent with the existing mission. The DASH-21 Facility, which would provide storage for mission essential equipment, and the High Bay Supply/Bulk Storage Warehouse would be newly constructed facilities that provide needed storage space for aircraft parts, emergency cargo, and mission equipment for the KC-46A operational program.

Table 2-1. Facilities and Infrastructure Projects for 24 KC-46A PAA at MacDill AFB

Project	Facility Size[a] (square feet)	Renovation Area (square feet)	Addition/New Area (square feet)
Facility Renovations			
ATGL Storage; Building 1042	6,417	6,417	N/A
MPC/AFE; Building 6	30,331	30,331	N/A
Active Duty ARSs x 2; Building 56	30,037	30,037	N/A
AFRC ARSs x 2; Building 53	19,476	19,476	N/A
AFRC Operations Support Squadron; Building 9	8,304	8,304	N/A
FUT; Building 1071	27,370	27,370	N/A
Washracks and Bird Bath; Facilities 563, 580, and 1359	107,441	107,441	N/A
Total Square Feet	**229,376**	**229,376**	N/A
New Facility Construction			
DASH-21 Facility	N/A	N/A	19,656
High Bay Supply/Bulk Storage Warehouse	N/A	N/A	5,798
Total Square Feet	N/A	N/A	**25,454**
Facility and Airfield Improvements			
Add/Alter AGE; Construct Jack Testing Pad in Maintenance Building; Building 552[b]	18,614	8,686	10,000[d]
Add/Alter Ed Ctr/Airmen Leadership School; Building 252	37,685	37,685	2,850
Add/Alter Corrosion Control Hangar 1	75,350	69,707	11,302[d]
Add/Alter General Purpose MX Hangar 2	82,715	69,373	11,302[d]
Add/Alter General Purpose MX Hangar 3	107,836	99,598	11,375[d]
Add/Alter General Purpose MX Hangar 4	77,703	69,729	11,302[d]
Add/Alter Fuel Cell Hangar 5	75,035	47,716	11,302[d]
Add/Alter Wheel and Tire Shop; Building 44	4,000	3,498	4,004[d]
Add/Alter BOT; Building 295	14,978	5,005	1,604
Add/Alter AMU; Building 55	22,199	2,002	6,297[d]
Add/Alter FUT Parking; Building 1071	6,750	435[c]	6,315
Add/Alter Apron & Hydrant Fueling Pits	3,798,909	679,666	371,667
Total Square Feet	**4,321,774**	**1,093,100**	**459,320**

[a] Facility size provided is the footprint (i.e., first floor) for the facility.

[b] Add/Alter AGE and Construct Jack Testing Pad in Maintenance Building are two separate projects that occur in the same building. Therefore, they have been combined into one row.

[c] Renovation area for FUT parking determined by existing pavement in Geographic Information Systems data.

[d] Addition/New Area for these projects would include building expansions, but not new impervious surfaces.

Key: N/A = Not Applicable; ATGL = Air Transportable Galley/Lavatory; MPC/AFE = Mission Planning Center/Aircrew Flight Equipment; ARS = Air Refueling Squadron; AFRC = Air Force Reserve Command; AGE = Aerospace Ground Equipment; FUT = Fuselage Training; MX = Maintenance; BOT = Boom Operator Training; AMU = Aircraft Maintenance Unit

Data Source: Bing Maps Aerial

Note: The location shown for the DASH-21 Facility is approximate, but the actual location would be within 100 feet of the location shown.

Figure 2-1. Facilities and Infrastructure Projects for 24 KC-46A PAA at MacDill AFB

New construction and facility additions would create ground disturbance and changes in existing impervious surfaces. Renovations would include both exterior and interior updates but would not create ground disturbance or a change in impervious surfaces. Renovations categorized as "exterior renovations" include the alteration of an existing outer wall of the facility, such as increasing the size of a bay door, and are separate from facility additions described under the "Improvements" category in **Tables 2-1** and **2-2**. New airfield pavements would be required for expansion of the Alpha (North) Ramp, and three additional hydrant pits would be added to the existing hydrant system; therefore, an increase in impervious surfaces would occur. **Table 2-2** summarizes the ground disturbance and changes in impervious surfaces expected for the MOB 6 beddown of 24 KC-46A PAA at MacDill AFB. Development would be constructed in accordance with required permits, and structural stormwater best management practices (BMPs) and low impact development technologies (such as bioswales) would be implemented, where practicable.

Table 2-2. Summary of Proposed Facility and Infrastructure Projects for 24 KC-46A PAA at MacDill AFB

Project Type	Ground Disturbance Acres (square feet)	Change in Impervious Surfaces Acres (square feet)
Renovations	5.3 (229,376)	+0 (0)
New Construction	0.6 (25,454)	+0.6 (25,454)
Improvements[a]	10.7 (465,644)	+8.8 (382,436)
Total Acres	**16.6 (720,474)**	**+9.4 (407,890)**

[a] Because design details for some facility improvements are not yet planned, the total does not reflect the total acres/square footage for all the facility and infrastructure projects. See **Table 2-1** for a breakdown of project details.

The existing utility infrastructure in the immediate area of all proposed construction would support all new and altered facilities. Facility construction and installation of new pavement at the following locations may require reconfiguring existing communication infrastructure: Expanded Alpha Ramp, B552 AGE Maintenance (MX), DASH-21 Facility, New Supply Warehouse, B295 Expanded Flight Sim, and B1071 Fuselage Trainer Parking.

2.3.1.3 Personnel

The current number of personnel at MacDill AFB and the projected increase necessary to support 24 KC-46A PAA are provided in **Table 2-3**. Currently, the installation population has approximately 24,018 personnel, including military, government civilians, contractors, and military dependents and family members (DAF 2022). Of the total installation personnel, approximately 3,822 full-time military and government civilians are associated with the KC-135 mission at MacDill AFB. Military personnel and their families are supported by on-base housing and housing options off-base within the surrounding community. Dependents of civilian personnel also live within the community surrounding the installation.

Table 2-3. Personnel and Dependent Changes for 24 KC-46A PAA at MacDill AFB

Personnel	Baseline Personnel Numbers	Alternative 1 Personnel Numbers			Net Change in Personnel Numbers	Net Percent Change in Personnel Numbers
		KC-135 Personnel Relocating[a]	Proposed KC-46A Mission Personnel[b, c]	Resulting Total Personnel		
Aerial Refueling Mission – Military (full-time)	3,298	-809	+1,030	3,519	+221	+6.7
Aerial Refueling Mission – Government Civilian	524	-49	+62	537	+13	+2.4
Other Installation Personnel[d]	15,653	0	0	15,653	0	0
Total Installation Personnel	**19,475**	**-858**	**+1,092**	**19,709**	**+234**	**+1.2**
Aerial Refueling Mission – Military Dependents and Family Members	4,543	-1,625	+1,674	4,592	+49	+1.1
Total Installation Personnel and Dependents	**24,018**	**-2,483**	**+2,766**	**24,301**	**+283**	**+1.2**

Source: DAF 2022

[a] Approximately 25 percent of the KC-135 aerial refueling mission personnel would relocate with the replaced KC-135 aircraft. Remaining KC-135 personnel would realign into the KC-46A mission at MacDill AFB.

[b] KC-46A workforce realignment dependents conservatively estimated at the same percent reduction as 2.5 times 65 percent of full-time military personnel only (DAF 2021d). School-age dependents of full-time military personnel were estimated at 1.5 times 65 percent of full-time military personnel.

[c] The government civilian personnel requirement may vary depending on the number of civilians currently resourced at the location being reviewed.

[d] Other Installation Personnel support missions other than the Aerial Refueling Mission at MacDill AFB.

The beddown of 24 KC-46A PAA would require approximately 1,092 total personnel, including 1,030 full-time military personnel (including officers and enlisted personnel) and 62 government civilians. Approximately 1,674 military family members and dependents would accompany the anticipated KC-46A full-time military personnel.

As explained in **Section 2.2**, the MOB 6 beddown at MacDill AFB would fully replace the existing KC-135 aerial refueling mission at the installation. Approximately 25 percent of the existing KC-135 full-time and government civilian personnel (and their associated dependents) would relocate to another installation (an action that would be subject to separate NEPA analysis). The remaining personnel would be realigned into the KC-46A mission (DAF 2022). Together, these changes would result in a net increase in aerial refueling mission-associated personnel and dependents at MacDill AFB by slightly more than 1 percent. Relocation of the KC-135 aircraft and personnel would be addressed in a separate NEPA analysis.

Support Services. The DAF has determined that existing installation childcare, housing, fitness, medical, and dining facilities and services would support the proposed 24 KC-46A PAA

personnel, family members, and dependents. Therefore, no new additional support services facilities are needed. It is assumed that only DoD civilians and part-time reservists would be from the local population, and incoming full-time military personnel and their dependents would need to be accommodated in housing both on- and off-installation within the surrounding community.

2.3.1.4 KC-46A Operations

Table 2-4 compares the number of annual airfield operations under the baseline mission to those anticipated with the beddown of 24 KC-46A PAA at MacDill AFB. Mission replacement at MacDill AFB would result in an approximately 15 percent increase in total annual aerial refueling mission operations from the 2021 KC-135 baseline at 11,522 per year to the projected KC-46A total of 13,221 per year (DAF 2021a). This projected total for incoming flight operations represents the upper bound (or maximum) number of based KC-46A aircraft operations under the MOB 6 mission. Because the KC-46A mission would maximize the use of simulators to conduct system continuation training and the KC-46A aircraft provide modern operational efficiency and added technological and defensive support capabilities that are lacking in the aging KC-135 tankers, actual operating levels for the incoming mission may be less than this upper bound number.

The numbers of annual airfield operations presented in **Table 2-4** reflects the anticipated training to familiarize and incorporate realigning KC-135 personnel into the KC-46A mission and ongoing training. The MOB 6 mission at MacDill AFB would use the same flight tracks, fuel jettison areas, and aerial refueling tracks as were used by the KC-135 mission.

Table 2-4. Baseline and Projected Annual Airfield Operations[a] with 24 KC-46A PAA at MacDill AFB[b]

	Landings and Takeoffs	Closed Pattern[c] (Number of Operations)	Total
Baseline Conditions			
KC-135	1,262	10,260	**11,522**
KC-46A	0	0	**0**
Total Ops Baseline	**1,262**	**10,260**	**11,522**
Alternative 1			
KC-135	0	0	**0**
KC-46A[d]	2,613	10,608	**13,221**
Total Ops Alternative 1	**2,613**	**10,608**	**13,221 (15% increase)**

Sources: HMMH 2022, DAF 2021a

[a] An operation is the accomplishment of a single maneuver, such as a takeoff/departure, an arrival/landing, or half of a closed pattern.

[b] The Proposed Action at MacDill AFB would fully replace the existing KC-135 mission with the KC-46A mission and training program. The numbers of airfield operations reflect training for realigning KC-135 personnel and ongoing mission training in the KC-46A program.

[c] A closed pattern consists of two operations: one takeoff and one landing. The numbers presented are operations.

[d] Approximately 10 percent of the total KC-46A operations would occur during environmental night (10 p.m. to 7 a.m.).

2.3.2 Alternative 2 – Fairchild AFB

2.3.2.1 Aircraft Beddown

Under Alternative 2, the 92nd Air Refueling Wing (92 ARW) would convert half of its 48 KC-135 PAA to 24 KC-46A PAA while maintaining 24 KC-135 PAA, resulting in no net change of PAA supporting the aerial refueling missions. Concurrent with the beddown of the 24 KC-46A PAA, the replaced half of the existing 92 ARW KC-135 aircraft would be either relocated to other installations or retired out of the DAF inventory, depending on the life-cycle status of each particular aircraft. Under this alternative, the KC-46A mission would be additive to the existing aerial refueling mission, which would continue to be operated using the remaining 24 KC-135 aircraft and associated personnel at the installation. The Survival, Evasion, Resistance and Escape (SERE) school, Joint Personnel Recovery Agency, and KC-135 Weapons Instructor Course missions would continue. The Weapons Instructor Course is responsible for 76 airfield annual sorties at Fairchild AFB and would continue regardless of the final KC-46A MOB 6 basing decision.

2.3.2.2 Facilities and Infrastructure

Fairchild AFB has the physical real estate and infrastructure available to beddown 24 KC-46A PAA. While existing facilities, airfield ramp, and hangars are currently used for KC-135 operations, phased use of these facilities would allow construction to occur in support of the 24 KC-46A PAA. Although new construction would be required, existing facilities would also be used for the beddown with only minor to moderate modifications or additions (**Table 2-5**).

Table 2-5. Facilities and Infrastructure Projects for 24 KC-46A PAA at Fairchild AFB

Project	Facility Size[a] (square feet)	Renovation Area (square feet)	Addition/New Area (square feet)
Facility Renovations			
KC-46A AMXS and Two AMUs; Building 2090	27,076	27,076	N/A
KC-135 AMXS and Two AMUs; Building 2097	25,254	25,254	N/A
Squad Ops Facility (Two KC-46A Active Duty ARSs); Building 2005	23,892	23,892	N/A
Squad Ops Facility (Two KC-135 Active Duty ARSs); Building 2007	26,326	26,326	N/A
4-Bay Hangar with Backshops; Building 2050	463,498	463,498	N/A
DASH-21, AME, ATGL, Seat Pallet, Engine Storage; Building 1003	31,499	31,499	N/A
AGE MX; Building 1013	27,563	27,563	N/A
KC-46A CTK; Building 1017	27,563	27,563	N/A
Enclosed Water Fill Station for Deicing Operations	4,679	4,679	N/A
Total Square Feet	**652,671**	**652,671**	N/A
New Facility Construction			
2-Bay Fuel Cell and Wash Rack Hangar with Backshops	178,013	N/A	178,013
Mission Planning Center	4,238	N/A	4,238
Installation Deployment Readiness Center	21,435	N/A	21,435
Squad Ops Facility (Two KC-46A ANG Squadrons)	29,745	N/A	29,745
Supply Warehouse	81,616	N/A	81,616
Total Square Feet	**315,047**	N/A	**315,047**
Facility and Airfield Improvements			
Flight Simulator Facility/FUT Complex	50,719	N/A	50,719
Parking Apron and Hydrant Fuel System Expansion	2,402,934	1,162,029	703,915
Engine Run-Up Area	195,553	195,553	N/A
Total Square Feet	**2,649,206**	**1,357,582**	**754,634**

[a] The facility size provided is the footprint (i.e., first floor) for the facility and any associated new pavement.

Key: N/A = Not Applicable; AMXS = Aircraft Maintenance Squadron; AMU = Aircraft Maintenance Unit; ARS = Air Refueling Squadron; AME = Alternate Mission Equipment; ATGL = Air Transportable Galley/Lavatory; AGE = Aerospace Ground Equipment; MX = Maintenance; CTK = Consolidated Tool Kit; ANG = Air National Guard; FUT = Fuselage Training

The proposed redevelopment would take place within the developed cantonment area of Fairchild AFB, as shown in **Figure 2-2**. Facilities modified to accommodate the MOB 6 beddown would support functions consistent with the existing uses. The proposed new facilities at Fairchild AFB would be needed to provide spaces and administrative, operational, and maintenance functions for the additive KC-46A MOB 6 mission.

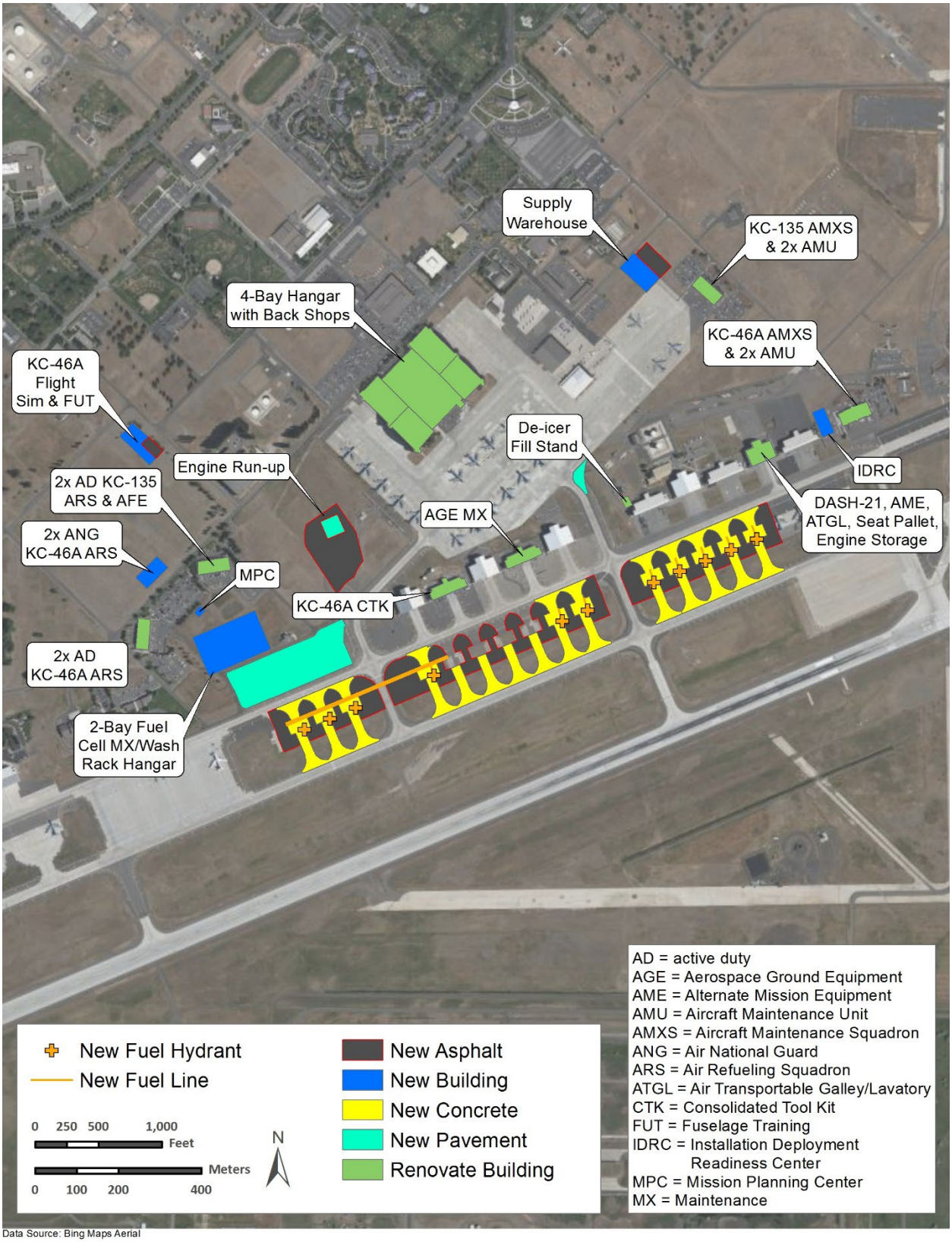


Figure 2-2. Facilities and Infrastructure Projects for 24 KC-46A PAA at Fairchild AFB

New construction and facility additions would create ground disturbance and changes in existing impervious surfaces. Renovations would include both exterior and interior updates but would not create ground disturbance nor a change in impervious surfaces. Renovations categorized as "exterior renovations" include the alteration of an existing outer wall of the facility, such as increasing the size of a bay door, and are separate from facility additions described under the "Improvements" category in **Tables 2-5** and **2-6**. **Table 2-6** summarizes the ground disturbance and changes in impervious surfaces expected for the MOB 6 beddown of 24 KC-46A PAA at Fairchild AFB. Development would be constructed in accordance with required permits, and structural stormwater BMPs and low impact development technologies (such as bioswales) would be implemented, where practicable.

Table 2-6. Summary of Proposed Facility and Infrastructure Projects for 24 KC-46A PAA at Fairchild AFB

Project Type	Ground Disturbance Acres (Square Feet)	Change in Impervious Surfaces Acres (Square Feet)
Renovations	15.0 (652,671)	0 (0)
New Construction	7.2 (315,047)	+ 7.2 (315,047)
Improvements	48.5 (2,112,216)	+17.3 (754,634)
Total	**70.7 (3,079,934)**	**+24.5 (1,069,681)**

The utility and communications infrastructure in the immediate area of all proposed construction would be used to support all new and altered facilities. Facility demolition and installation of new pavement at the proposed engine run-up area and the new pavement north of the proposed engine run-up area would require reconfiguring existing fiber optic cables and sensor systems and could also require installation of additional field distribution boxes and sensor support equipment.

2.3.2.3 Personnel

The numbers of current personnel at Fairchild AFB and the projected increase necessary to support 24 KC-46A PAA are provided in **Table 2-7**. Currently, the installation has approximately 7,565 total personnel, including military, part-time Guardsmen, government civilians, contractors, and military family members and dependents (Fairchild AFB 2020a, DAF 2022). Of the total installation personnel, 5,107 full-time military personnel and their 2,458 associated family members and dependents are associated with the KC-135 aerial refueling mission at Fairchild AFB, and live both on- and off-base within the surrounding community. Dependents of non-military personnel also live within the communities surrounding the installation.

As explained in **Section 2.2**, the MOB 6 beddown would be added as a new aerial refueling mission operating out of Fairchild AFB, partially replacing the existing KC-135 aerial refueling mission. The beddown of 24 KC-46A PAA would require approximately 1,964 personnel, including 1,915 full-time active duty and ANG personnel and 49 government civilians. An estimated 3,112 dependents and family members would accompany the anticipated full-time KC-46A personnel. Additionally, ANG would have an association with the active duty component, which is included in the incoming and remaining full-time military personnel listed in **Table 2-7**. Concurrent with the incoming KC-46A mission and personnel, approximately 54 percent of the

existing KC-135 full-time military personnel (and their associated dependents) would relocate to another installation (an action that would be subject to separate NEPA analysis). KC-135 mission personnel remaining at Fairchild AFB would continue to operate the reduced KC-135 aerial refueling mission alongside the new MOB 6 mission. Together, these changes would result in a net 13 percent increase in aerial refueling mission personnel and associated dependents at Fairchild AFB.

Table 2-7. Personnel and Dependent Changes for 24 KC-46A PAA at Fairchild AFB

Personnel	Baseline Personnel Numbers	Alternative 2 Personnel Numbers			Net Change in Personnel Numbers	Net Percent Change in Personnel Numbers
		KC-135 Personnel Relocating [a]	**Proposed KC-46A Mission Personnel [b, c]**	**Resulting Total Personnel**		
Aerial Refueling Mission – Military (full-time)	3,816	-1,581	+1,915	4,150	+334	+9
Aerial Refueling Mission – Government Civilian	452	-45	+49	456	+4	+1
Other Installation Personnel[d]	839	0	0	839	0	0
Total Installation Personnel	**5,107**	**-1,626**	**+1,964**	**5,445**	**+338**	**+7**
Aerial Refueling Mission – Military Dependents and Family Members	2,458	-2,458	+3,112	3,112	+654	+27
Total Installation Personnel and Dependents	**7,565**	**-4,084**	**+5,076**	**8,557**	**+992**	**+13**

Source: DAF 2022

[a] Relocation of the 24 KC-135 aircraft would reduce (through realignment) workforce and dependent baseline numbers by approximately 40 percent and 100 percent, respectively (DAF 2022).

[b] Incoming KC-46A dependents were conservatively estimated using the DoD's standard calculation: 2.5 times 65 percent of full-time military personnel (DAF 2021d). School-age dependents of full-time military personnel were estimated at 1.5 times 65 percent of full-time military personnel.

[c] The civilian requirement may vary depending on the number of civilians currently resourced at the location being reviewed.

[d] Other Installation Personnel support missions other than the Aerial Refueling Mission at Fairchild AFB.

Support Services. The DAF determined that existing installation childcare, housing, fitness, medical, and dining facilities and services would support the proposed 24 KC-46A PAA personnel, family members, and dependents. Therefore, no new additional support services facilities are needed. It is assumed that incoming full-time military personnel and their dependents would need to be accommodated in housing both on- and off-installation within the surrounding community.

2.3.2.4 KC-46A Operations

Table 2-8 compares the number of annual airfield operations under the baseline mission to those anticipated with the beddown of 24 KC-46A PAA at Fairchild AFB. As explained in **Section 2.2**, the MOB 6 beddown would partially replace the KC-135 mission at Fairchild AFB and would be additive to the overall mission construct and ongoing numbers of airfield operations conducted at the installation. Under Alternative 2, half of the aircraft associated with the KC-135 mission would be relocated or retired, and the remaining half would continue to operate along with the incoming KC-46A aircraft at Fairchild AFB. As a result, the total annual tanker operations at Fairchild AFB would increase by approximately 29 percent from 16,758 to 21,600 (DAF 2021a). The MOB 6 mission at Fairchild AFB would use the existing KC-135 flight tracks, fuel jettison areas, and aerial refueling tracks.

Table 2-8. Baseline and Projected Annual Airfield Operations[a] with 24 KC-46A PAA at Fairchild AFB[b]

Aircraft	Landings and Takeoffs	Closed Pattern[c] (Number of Operations)	Total Operations (Percent [%] Change)
Baseline Conditions			
KC-135	3,244	13,514	16,758
KC-46A	0	0	0
Total Ops Baseline	**3,244**	**13,514**	**16,758**
Alternative 2			
KC-135	1,622	6,757	8,379
KC-46A[d]	2,613	10,608	13,221
Total Ops Alternative 2	**4,235**	**17,365**	**21,600 (29% increase)**

Sources: HMMH 2022, DAF 2021a and 2021b

[a] An operation is the accomplishment of a single maneuver, such as a takeoff/departure, an arrival/landing, or half of a closed pattern.

[b] Existing annual day and nighttime airfield operations are from the projected operations for 48 KC-135s at Fairchild AFB included in the 2018 EA addressing the addition of 12 KC-135s to Fairchild AFB or MacDill AFB. Projected annual airfield operations are consistent with the projected operations included in the MOB 4 EIS for 24 KC-46A PAA.

[c] A closed pattern consists of two operations: one takeoff and one landing. The numbers presented are operations.

[d] Approximately 10 percent of the total KC-46A operations would occur during environmental night (10 p.m. to 7 a.m.).

Fairchild AFB's location makes aircraft deicing regularly necessary prior to operations. To accommodate the 24 KC-46A, a new enclosed water fill station would be constructed to assist in deicing operations. With the addition of the enclosed water fill station, deicing for KC-46A operations would occur in the same manner that it currently takes place at Fairchild AFB. Approximately 150 gallons of undiluted deicing fluid would be required per aircraft per deicing operation as required.

2.3.3 No Action Alternative

NEPA, specifically 40 CFR Part 1502.14(c), requires the analysis of a No Action Alternative, which provides a benchmark that enables decision makers to compare the magnitude of the environmental effects on a proposed action and alternatives. No action means that an action

would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward.

The No Action Alternative for this EIS reflects the existing environment, where the KC-46A beddown would not occur at any base at this time, and no change would occur to the existing KC-135 mission at either installation. At MacDill AFB, the 2017 *EA Addressing Additional KC-135 Aircraft at MacDill AFB* analyzed aerial refueling operations for 24 KC-135 aircraft up to a maximum of 21,329 per year (DAF 2017b). As of 2021, following the phased arrival of the additional eight aircraft, flight operations data collected for the program showed that KC-135 flight training has steadily increased each year since implementation of the 2017 EA. Because the aerial refueling mission at MacDill AFB is not currently conducting training at the 2017-projected maximum number of operations, analysis in this EIS conservatively uses the most recent and highest volume of KC-135 operational activity, 11,522 total annual aerial refueling mission operations per year, as the baseline against which the proposed incoming KC-46A refueling program will be compared. Therefore, under the No Action Alternative, it would be reasonable to expect that the increasing trend in KC-135 operations at MacDill AFB would continue until the DAF implements its plans to retire or relocate the aircraft at the installation.

No construction, renovation, or demolition of any structure or other infrastructure would occur to support beddown of the KC-46As. Changes in personnel and to existing flight operations would not occur. At each installation, ongoing and currently planned activities (identified in the cumulative effects analyses in **Section 3.6**) and programs would continue regardless of implementation of the KC-46A beddown as these existing activities have been approved by DAF and are supported by existing NEPA documentation.

2.3.4 Comparison of Site Alternatives

The process of planning the beddown for a new aircraft and mission considers facility requirements that can be partially or wholly fulfilled by existing facilities on the installation. The siting process for new construction is iterative and includes identifying suitable sites relative to existing space and facilities that provide a reasonable operational efficiency/cost-benefit value. Various factors influence siting of facilities within a developed cantonment area. These factors involve operational functionality, safety, and compliance with regulations and policies (federal, state, and local). Utilities siting, to include upgrades and rerouting, could also be required to accommodate new construction and expansions of airfield pavements. The siting process for utilities would focus on existing conduits and rights-of-way, previously disturbed areas of the airfield, or areas that would also be disturbed for facility modifications.

All construction contracts would require the use of UFC 3-101-01, *Architecture*, and attainment of a Leadership in Energy and Environmental Design certificate level of silver. Construction and renovation projects within the installation's 65-dBA noise contour would include acoustical design considerations for façade elements and interior design requirements per UFC 3-101-01. Land use would comply with DoD Instruction 4165.57, *Air Installations Compatible Use Zones*; Air Force Handbook 32-7084, *Air Installation Compatible Use Zone (AICUZ) Program Manager's Guide*; and AFI 32-7063, *Air Installations Compatible Use Zones Program*.

Depending on available infrastructure; facilities; and, to some degree, personnel available for the KC-46A MOB 6 mission, proposed construction, demolition, renovations, and incoming personnel numbers vary between the Alternative 1 at MacDill AFB, Florida, and Alternative 2 at Fairchild AFB, Washington. The facility siting analysis for each alternative basing location considered the functional requirements of the MOB 6 mission and compared them with the existing infrastructure and environmental constraints at each installation.

Proposed aircraft operations for MOB 6 are consistent between the Alternative 1 and Alternative 2. The baseline aircraft operations however vary for each installation due to the various missions and tenants supported at each, and are consistent with the most recent data collected and studied at each base. These baseline operational data represent the best available information at the time of EIS development and are used as the comparative baseline to determine potential effects of the Proposed Action and alternatives on environmental resources in accordance with NEPA. Discrepancies in annual operations of a particular aircraft are possible from year to year, for example, due to variation in staffing availability, maintenance schedules, and deployment. These discrepancies do not warrant continuous updates to the baseline operations to analyze and present the incremental effects of the Proposed Action.

Table 2-9 summarizes the comparison of the Proposed Action and alternatives.

Table 2-9. Summary Comparison of Alternatives

Alternative Components	Alternative 1 (Preferred Alternative – MacDill AFB, Florida)		Alternative 2 (Fairchild AFB, Washington)		No Action Alternative
	Baseline	Proposed	Baseline	Proposed	
Total Change in Aircraft [a]	**--**	**No change in total PAA**	**--**	**No change in total PAA**	**No change**
Active Duty KC-135 PAA	24	0	48	24	No change from baseline at either AFB
Active Duty KC-46A PAA	0	24	0	24	
Total Change in Refueling Tanker Aircraft Operations	**--**	**15% increase to 13,221 operations per year [b]**	**--**	**29% increase to 21,600 operations per year**	**No change**
Active Duty KC-135 Operations	11,522	0	16,758	8,379	No change from baseline at either AFB
Active Duty KC-46A Operations	0	13,221	0	13,221	
Total Change in Infrastructure and Facilities	**--**	**Requires 21 development actions; disturbs approximately 16.6 acres, and adds approximately 9.4 acres of impervious surface**	**--**	**Requires 17 development actions; disturbs approximately 70.7 acres, and adds approximately 24.5 acres of impervious surface**	**No change**
Infrastructure and Facilities	See existing features shown in **Section 2.3.1.2**	Constructs 2 new facilities (+0.6 acre); renovates 7 existing facilities (+0 acre); entails 11 alteration actions to expand existing facilities and infrastructure (+8.8 acres) [e]; and upgrades by replacement of the existing hydrant fuel system, which would add 3 hydrant pits (up to 0.01 acre), resulting in an increase of approximately 9.4 acres of impervious surfaces	See existing features shown in **Section 2.3.2.2**	Constructs 5 new facilities (+7.2 acres), renovates 9 existing facilities (+0 acre), and entails 3 alteration actions to expand existing facilities and infrastructure (+17.3 acres) [e], resulting in a net increase of 24.5 acres of impervious surfaces	No change from baseline at either AFB
Total Personnel Change [c]	**--**	**Net increase in installation personnel and associated dependents by approximately 1%**	**--**	**Net increase in installation personnel and associated dependents by approximately 13%**	**No change**

Alternative Components	Alternative 1 (Preferred Alternative – MacDill AFB, Florida)		Alternative 2 (Fairchild AFB, Washington)		No Action Alternative
	Baseline	Proposed	Baseline	Proposed	
Number KC-135 Personnel [d]	3,822	-858 relocating; 2,964 realign into the KC-46A mission	3,816	-1,626 relocating; 2,190 remain and continue the KC-135 mission	No change from baseline at either AFB
Number KC-135 Dependents	4,543	-1,625 relocating; 2,918 remain	2,458	-2,458	No change
Number KC-46A Personnel [d]	0	+1,092	0	+1,964	No change
Number KC-46A Dependents	0	+1,674	0	+3,112	No change

[a] Aircraft operations change is the difference between the total baseline and total projected for all aircraft types.

[b] Percent differences represents comparison of the projected KC-46A operational capacity with the FY 2021 representative year of operational activity for the KC-135 missions at MacDill AFB and Fairchild AFB, respectively (HMMH 2022). Mission data show that flight activities have steadily increased at the installation since 2018. Despite the anticipated increase in flight operations at MacDill AFB, actual flight activities would be minimized through operational efficiency and added capabilities of the incoming KC-46A aircraft and mission to fully replace the sole existing KC-135 mission there, as well as use of simulators to conduct KC-46A system continuation training. The increase in flight operations at Fairchild AFB would be anticipated because the MOB 6 mission would be additive to the other existing and ongoing mission programs at the installation.

[c] The personnel and dependent numbers are noticeably different between the installations because the KC-46A mission at MacDill AFB would be a replacement mission and the mission at Fairchild AFB would be additive. Remaining KC-135 personnel at Fairchild AFB would continue in the ongoing KC-135 mission. The numbers of dependents and family members incoming with the KC-46A mission were conservatively estimated using the DoD's standard calculation: 2.5 times 65 percent of incoming full-time military personnel (DAF 2021d). The numbers of school-age dependents were estimated using the standard calculation of 1.5 times 65 percent of the full-time military personnel.

[d] Numbers of KC-135 and KC-46A personnel represent the sum of full-time military and civilian mission personnel at each installation (see **Sections 2.3.1.3** and **2.3.2.3**).

[e] Additional square footage for facility expansions on existing pavement is not included in the ground disturbance or change in impervious surfaces calculations.

Key: AFB = Air Force Base; PAA = Primary Aerospace Vehicle Authorization; MOB = Main Operating Base

2.4 Identification of Preferred Alternative

According to CEQ NEPA guidelines, an agency's preferred alternative is the alternative that the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. On December 21, 2021, the Secretary of the Air Force Public Affairs identified the Alternative 1 at MacDill AFB, FL (detailed in **Section 2.3.1**) as the Preferred Alternative for the KC-46A MOB 6 beddown (DAF 2021b). The DAF is identifying the Preferred Alternative pursuant to 40 CFR Part 1502.14(d); however, no final decision selecting a particular alternative for implementation has been made. Upon completion of the Final EIS, the DAF decision maker will consider the EIS analysis to support selection of the alternative that best satisfies the stated purpose and need within mission constraints. The final decision will be documented in the Record of Decision (ROD).

2.5 Mitigation Measures

Per CEQ regulations (40 CFR Part 1508.1), mitigation measures avoid, minimize, remediate, or compensate for environmental impacts caused by a proposed action or alternatives. While NEPA requires consideration of mitigation, it does not mandate the form or adoption of any mitigation. Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments

Table 2-10 summarizes the avoidance, minimization, and mitigation measures identified to reduce impacts from the Proposed Action on environmental resources at MacDill AFB or Fairchild AFB. All mitigation measures identified in this EIS have been developed specifically in response to the MOB 6 beddown. These are new measures that are not currently in place and would be implemented to avoid, minimize, remediate, or compensate the impacts anticipated from the Proposed Action. Avoiding, minimizing, or reducing potential impacts has been a priority guiding the development of the KC-46A scenarios and aircraft operations. Mitigation measures can either be built or designed into the Proposed Action, applied to construction or operation involved in the action, or implemented as compensatory measures. Following the ROD, a Mitigation Plan would be prepared in accordance with 32 CFR Part 989.22(d). The Mitigation Plan would address specific mitigations identified and agreed to during the EIAP. The Mitigation Plan would identify principal and subordinate organizations having responsibility for oversight and execution of specific mitigation and management actions. The plan will be prepared in accordance with the CEQ mitigation and monitoring guidance.

Specific mitigation measures identified in this EIS are presented in **Table 2-10** and in the **Section 3** environmental consequences evaluations for each alternative. **Table 2-10** identifies proposed measures to avoid or minimize the potential for environmental impacts as well as mitigation measures based on consultations with federal and state agencies responsible for

ensuring compliance with resource-specific regulations (e.g., NHPA Section 106 consultation with State Historic Preservation Officers [SHPOs], Endangered Species Act [ESA] Section 7 consultation with the USFWS). The table presents the mitigation measures by resource area and installation.

Table 2-10. Avoidance, Minimization, and Mitigation Measures to Reduce Potential for Adverse Impacts on Environmental Resources

Resource	Measures to Reduce Adverse Environmental Impacts
Noise	*MacDill AFB:* To reduce the effects of noise, MacDill AFB limits transient aircraft to one approach and a full stop landing between the hours of 10 p.m. and 6 a.m. Fighter aircraft are restricted to straight-in/full-stop approaches/landings after 9 p.m. Additionally, the installation controls and schedules missions to keep noise levels low, especially at night. Flight patterns specific to MacDill AFB have resulted from the following considerations: • Takeoff patterns routed to avoid noise-sensitive areas as much as possible • Arrivals and departures routed to avoid restricted airspace • Criteria developed to govern the speed, rate of climb, and turning radius for each type of aircraft • Efforts made to control and schedule missions to keep noise levels low, especially at night • Coordination conducted with the FAA to minimize conflict with civil aircraft operations (DAF 2017b). *Fairchild AFB:* To reduce the effects of noise, Fairchild AFB restricts overflights over Eastern Washington State Hospital, Sunset Elementary School, and housing areas on-installation. Overflights are not permitted below 1,000 feet AGL over Airway Heights Correctional City nor are they permitted below 5,000 feet MSL for fixed-wing aircraft or below 500 feet AGL for helicopters over the City of Spokane (DAF 2018a).
Biological Resources	*At either installation:* • To protect special status birds, when feasible, construction activities, particularly any tree-clearing activities, would not occur during nesting season, which generally runs April 1 through August 31. If tree clearing activities cannot avoid nesting season, pre-construction surveys could be conducted to identify and avoid any active nests. Additionally, construction personnel would be trained to identify, avoid, and report active nests. • To minimize the introduction and spread of non-native and invasive species, all construction equipment would be inspected and cleaned to remove seeds, plants, and soil upon entering and exiting construction areas or the installation. All construction materials and any fill will also be inspected to ensure it is as free of seeds, plants, or undesirable soil as practicable. Additionally, where appropriate, disturbed areas will be revegetated with native plant species. • Additional appropriate mitigation to be identified through consultation. *MacDill AFB:* In consideration of the KC-46 MOB 6 biological opinion conservation recommendations, the installation could: • Remove or minimize food sources on the airfield; prohibit planting or re-seeding with plants that attract wildlife; encourage landscape

Resource	Measures to Reduce Adverse Environmental Impacts
	designs that minimizes features that attract or sustain wildlife around the airfield. • Continue to support the installation BASH program including DNA analysis of snarge and analysis of BASH data to determine potential trends that could be associated with wildlife conflicts. • Continue to support implementation of new projects that increase living shoreline, wetland creation, and mangrove and saltern restoration projects to improve habitat.
Cultural Resources	*MacDill AFB:* MacDill AFB has developed and will follow an MOA with the Florida SHPO regarding renovations to Hangars 1, 2, 3, 4, and 5. To minimize adverse effects, the additions would be designed to mimic the roofline and general historic appearance of the hangars. The exterior finishes would however be differentiated from the historic finishes to be consistent with Standard 9 of the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, such as different types of concrete wainscoting and corrugated metal wall panels. In addition, MacDill AFB would send three-dimensional renderings for each hangar and current photographs of the hangars to the SHPO per their request.
Socioeconomics	No installation-specific mitigation is identified.
Soils and Geology	No installation-specific mitigation is identified.
Water Resources	No installation-specific mitigation is identified.
Infrastructure and Transportation	No installation-specific mitigation is identified.
Land Use	No installation-specific mitigation is identified.
Hazardous Materials and Waste	No installation-specific mitigation is identified.
Health and Safety	No installation-specific mitigation is identified.
Air Quality	No installation-specific mitigation is identified.
Environmental Justice and Other Sensitive Receptors	No installation-specific mitigation is identified.

Key: AFB = Air Force Base; MSL = mean sea level; AGL = above ground level; BASH = Bird/Wildlife Aircraft Strike Hazard; MOA = Memorandum of Agreement; SHPO = State Historic Preservation Office; FAA = Federal Aviation Administration

2.6 Sustained Compliance Actions

In addition to mitigation measures, this EIS has identified a series of sustained compliance actions that are currently in place for each installation, and that would continue to be implemented under the Proposed Action in accordance with applicable regulations or DAF guidance. These compliance actions are routine and standard practices and are not specific to the MOB 6 beddown. These actions would continue to be implemented under the MOB 6 beddown to reduce the potential for environmental impacts. Specific compliance actions identified in this EIS are presented in **Table 2-11** and in the environmental consequences analysis for the Proposed Action and alternatives in **Section 3**. The table presents the compliance actions by resource area and installation.

Table 2-11. Sustained Compliance Actions

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
Noise	At either installation: • Operation of heavy construction equipment would occur during normal weekday business hours in areas adjacent to noise sensitive land uses such as residential and recreational areas. • Heavy equipment mufflers would be properly maintained and in good working order. • Personnel, particularly equipment operators, would wear adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations. KC-46A MOB 6 aircrews would conduct airfield operations between 7 a.m. and 10 p.m.
Biological Resources	At either installation, adherence to their existing robust BASH programs, including implementing multiple techniques to minimize aircraft strikes from raptors, waterfowl, and other migratory birds and wildlife would continue. Installations would also update BASH Plans to incorporate KC-46A operations to minimize the risk of bird/wildlife-aircraft strikes. MacDill AFB would continue to implement mitigation measures recommended in the Florida's Imperiled Species Management Plan 2016-2026 and the MBTA to reduce or avoid potential construction impacts on migratory birds: • Groundbreaking construction activities or tree-cutting activities would be performed before migratory birds return to MacDill AFB or after all young have fledged to avoid incidental take. • If construction is scheduled to start during the period when migratory birds are present, a site-specific survey for nesting migratory birds would be performed immediately prior to construction by a qualified biologist. • If nesting birds are found during the survey, buffer areas would be established around nests. Construction would be deferred in buffer areas until birds have left the nest. A qualified biologist will confirm that all young have fledged. MacDill AFB would continue to adhere to measures protective of the Florida burrowing owl and gopher tortoise as outlined in the INRMP. Additionally, routine surveys of the installation would continue to determine presence of protected species.
Cultural Resources	At either installation, personnel would adhere to procedures for the inadvertent discovery of cultural resources or human remains as outlined in each installation's ICRMP.
Socioeconomics	No installation-specific actions are identified.
Soils and Geology	At either installation, geotechnical soils tests would be conducted prior to or during construction and demolition activities to determine if limitations exist and implement appropriate environmental/engineering protection measures. Measures from project-specific and installation SWPPPs and ESCPs would be implemented to minimize erosion, sedimentation, and stormwater runoff, such as: • Silt fencing • Sediment traps • Application of water to disturbed soils

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	• Revegetation of disturbed areas with native plants

Water Resources	Measures from the installations' Spill Prevention, Control, and Countermeasure Plans or Integrated Contingency Plans, including requirements for secondary containment, would be implemented as described for Hazardous Materials and Wastes.
	
	Erosion and sediment controls would be implemented as described for Geological Resources.
	
	To minimize impacts from sedimentation on water quality, installations would be required to obtain a NPDES General Permit for all construction activities affecting more than 1 acre.
	
	Following the guidance provided by Section 438 of the EISA, the DAF would ensure that post-project hydrology mirrors pre-project hydrology on and around the Project Area, to the maximum extent technically feasible, with respect to temperature, rate, volume, and flow duration.
	
	Per EO 14008, *Tackling the Climate Crisis at Home and Abroad*, DoD UFC-2-100-01, *Installation Master Planning*, and the DoD's 2021 *Climate Adaptation Plan*, planning, design, and construction of new facilities and infrastructure on the installations would incorporate measures, strategy, and technology to promote climate resiliency to the extent practicable.
	
	At MacDill AFB, required development designs or measures (MacDill AFB 2022a) would be implemented to avoid flooding impacts on facilities and infrastructure and include:
	• Per EO 11988, *Floodplain Management*, and the Federal Flood Risk Management Standard:
	  ○ For the construction of new facilities, floodplain mitigations would be accomplished through elevating the facility above the 100-year flood elevation; mission critical facilities must be constructed 3 feet above the base flood elevation and non-mission critical facilities must be elevated 2 feet above the flood elevation.
	  ○ For facility renovation that exceed 50% of the facility replacement cost, flood mitigation measures would include locating critical infrastructure (e.g., electrical and HVAC systems) above the flood elevation whenever practical.
	  ○ Flood avoidance would be implemented to the extent practicable during hangar modification design and construction.
	
	• Per the SWFWMD, the proposed new construction, facility addition, and renovations actions at MacDill AFB would be subject to the following requirements:
	  ○ Construction projects that create more than 4,000 square feet of impervious and semi-impervious surfaces for new facility construction or addition, or 9,000 square feet of impervious and semi-impervious surface for vehicle traffic, shall require application for an Environmental Resource Permit through the SWFWMD.

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	○ Design measures for construction of new facilities would include elevating the facility above the 100-year floodplain as well as the construction of appropriately sized stormwater management features, such as drainage swales and detention basins, to compensate for the increase in impervious surface. ○ When expanding an existing facility through construction of an addition, it is impractical to elevate the addition above the floodplain; however, facility additions that create more than 4,000 square feet of new impervious and semi-impervious surface area would require construction of stormwater mitigation measures such as drainage swales or stormwater detention basins. ○ The construction of facility infrastructure projects, such as roadways and parking lots, shall also include design measures to mitigate flooding impacts. Infrastructure projects that create an increase in impervious and semi-impervious surface of more than 9,000 square feet shall require construction of stormwater management features such as drainage swales and/or detention basins. ○ All drainage swales or stormwater detention basins shall be designed to provide for water quality and quantity treatment sufficient to handle a 25-year, 24-hour storm event. • In addition to project-specific avoidance, minimization, and mitigation measures, MacDill AFB implements the following installation-wide projects to combat impacts from climate change and severe weather and prevent further exacerbation of climate change impacts: ○ ***Oyster Reef Shoreline Stabilization Project.*** MacDill AFB, USFWS and regional partners designed and implemented a living shoreline project starting in 2004 that protects 1.6 miles of base coastline. By engineering with nature, this ongoing project helps to mitigate the effects of climate change by creating a natural shoreline stabilization system that will adjust to changes in sea level to control shoreline erosion from heavily trafficked shipping lanes in Tampa Bay. The shoreline is composed of oyster reefs from man-made structures, fossilized shells, and coastal marsh plants to decrease wave energy, increase sediment accumulation, increase water quality through oyster filtration, increase biodiversity and provide potential habitat for several marine species. This project helps to protect portions of remaining undeveloped shoreline in the Tampa Bay region. Six phases of work have been completed to date. ○ ***Surface Water Improvement and Management Restoration.*** MacDill AFB and the SWFWMD's Surface Water Improvement and Management Program, along with other project partners, designed and implemented a three-phase project to improve intertidal and freshwater wetland habitats on MacDill AFB. The project goals were to treat stormwater runoff and improve habitat. This project consisted of invasive species removal, regrading of soils to appropriate elevations, installation of new infrastructure to improve storm water flow, and replanting of the habitats with appropriate native vegetation. The restored wetland habitats and improved storm infrastructure created increased water quality improvements by slowing storm water discharges into the bay, which is especially important given anticipated increases in frequency and duration of storms due to climate change. In addition, these improved habitats will better enable the natural areas at MacDill to adapt to anticipated sea level rise and storm surge effects from increased severe weather. ○ ***Airfield Drainage Project.*** MacDill AFB's airfield required restoration of poor drainage and low-lying areas and to reduce BASH. MacDill AFB and the BASH Group designed and implemented a mitigation project to compensate for lost wetland habitats as a result of this required work. The resulting projects restored freshwater and saltwater wetland areas within altered areas on the southern portion of the installation. These

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	restored habitats improved natural stormwater flow and continue to provide increased natural water quality improvements by slowing stormwater discharges into the bay, which is especially important given anticipated increases in frequency and duration of storms due to climate change. The enhanced habitats also created enhanced adaptability of natural habitats to anticipated sea level rise and storm surge effects from increased severe weather. ○ ***Mangrove Restoration.*** MacDill AFB, Ash Engineering, and Ecosphere Restoration Institute designed and implemented a multi-phase project to restore mangrove and wetland habitats along the southern end of the installation. The goals of the project were to restore hydrologic conditions, create and enhance habitat, and control invasive and nuisance species. Mosquito ditch spoil mounds within mangrove swamps were removed via hydro blasting to restore appropriate elevations, hydrology, and salterns, and freshwater marshes were re-created in areas where they likely had historically been located. In areas, native plants were installed to help accelerate recruitment of natural habitat and compete against potential invasive plant species. Secondary project goals include water quality improvements through increased biological filtration of runoff; storm surge protection through natural coastal buffer habitat; and enhanced adaptability of natural habitats to anticipated changes in climate, sea level rise, and storm surge effects from increased severe weather. The project is on-going with several phases remaining to be completed. ○ ***Climate Change Ecosystem Assessment.*** All DoD installations with natural resources on their property are required to assess the effects of climate changes on their respective ecosystems according to the Sikes Act. The DoD released additional guidance in 2019 for incorporating climate change considerations into installation INRMPs. A climate change analysis specific to MacDill AFB was developed by Colorado State University in March 2019 and is included in the INRMP. The analysis provided guidance for assessing risk to built and natural infrastructure on the installation based on forecast modelling of different projected climate change scenarios. Additionally, the analysis provided information for installation stakeholders to consider when evaluating management action options for addressing natural resources issues. ○ ***Severe Weather/Climate Change Risk Assessment***. The DAF required each base complete a Severe Weather/Climate Change Screening and Risk Assessment of over 20 weather phenomena. MacDill AFB completed the assessment and reported their findings back to the Air Force Civil Engineer Center in December 2020. MacDill AFB will work with the Air Force Civil Engineer Center to develop mitigation strategies for the effects of severe weather and climate change. One current strategy is to move existing electrical service from overhead to underground, which has increased the resiliency of the base electric network and proven successful during recent tropical storm events. ▪ ***Hurricanes***. MacDill AFB has an active emergency management program which plans and drills the installation's response and recovery to tropical events. MacDill personnel prepare facilities and infrastructure for the weather event, maintain continuity of operations at hardened alternate facilities, and respond to recover installation operations quickly. MacDill AFB staff coordinate emergency management activities with local partners through Emergency Operation Centers using FEMA Incident Command System protocols. ▪ ***Lightning.*** The Tampa Bay Region is one of the most active areas in the country for lightning activity. MacDill AFB has protocols in place when lightning is detected within 5 miles of the installation. A

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	warning goes out through several media avenues telling people to take cover and sounding an all clear when the threat has passed. ▪ ***Sea Level Rise.*** The long-term impacts of sea level rise are being worked through by MacDill AFB and their regional partners. Tampa Bay Regional Planning Council created a Regional Resiliency Coalition under which six counties and over 20 cities signed a Memorandum of Understanding to develop a Regional Resiliency Action Plan, which guides communities in hazard assessment and to develop policies and projects to mitigate the impacts of climate change and severe weather. MacDill AFB staff actively participate in the Regional Resiliency Coalition and the Regional Resiliency Action Plan development. Based on sea level rise projections from the National Oceanic and Atmospheric Administration and U.S. Army Corps of Engineers, MacDill AFB's built environment would fare well through the 2080-2100 timeframe under liberal seal level growth. The installation's natural infrastructure, especially along the southern boundary of the installation, are most susceptible to sea level rise flooding, causing wildlife migration to dryer, upland areas. MacDill AFB will conduct follow-up planning to anticipate the long-term impacts.
Infrastructure and Transportation	To ensure mission sustainment over the intended lifespan of the infrastructure and assets, installation planning and project designs for construction of new facilities at either installation would be conducted in accordance with the policies and requirements identified in for Water Resources. Erosion and sediment controls would be implemented as described for Geological Resources. Measures to preserve hydrologic conditions during and after construction of new facilities and infrastructure would be implemented as described for Water Resources. During construction: • Contractors would adhere to the ISWMP to minimize construction and demolition debris sent to the landfill. • Deliveries would be scheduled outside of peak periods of inbound traffic. • Workers would use alternative gates to reduce congestion at the installations' main gate. As appropriate, the installations would implement measures to reduce gate congestion, such as: • Adjusting operational schedules • Upgrading entry gates • Providing additional personnel at gates to process security checks during peak hours
Land Use	Construction contractors would coordinate with appropriate installation managers to ensure development is conducted in accordance with existing LUCs.
Hazardous Materials and Waste	Temporary ASTs would be installed for onsite storage of petroleum products for construction, renovation, and demolition projects.

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	Construction contractors would implement BMPs associated with storage of hazardous materials, including: • Secondary containment • Recurring inspections • Spill kit use as required Construction contractors would dispose hazardous materials in accordance with federal and state laws and installation-specific hazardous waste management plans. Prior to the start of any construction or demolition, the DAF would coordinate with the installation's ERP office to ensure that ground disturbance is coordinated with ongoing remediation and investigation activities. All applicable LUCs would be followed before, during, and after construction, renovation, and demolition. Construction contractors would implement groundwater control measures should contaminated groundwater be encountered, including proper storage and handling of hazardous materials and waste containers in assigned areas, use of secondary containment for hazardous materials and wastes, use of dry clean-up methods to collect spills, use of oil water separators, and regular maintenance of stormwater drainage conveyance areas. Any existing groundwater monitoring wells or treatment systems would be protected or relocated during ground-disturbing activities. Construction contractors would immediately stop work, report the discovery of undocumented contaminated soil or groundwater, and implement appropriate safety measures. Buildings proposed for renovation or demolition would be surveyed for hazardous materials and toxic substances, as necessary, prior to work activities. Contractors would wear appropriate PPE and adhere to all federal, state, and local regulations; installation asbestos-containing materials management plans; and installation lead-based paint management plans.
Health and Safety	Installations would update BASH Plans to incorporate KC-46A operations to minimize risk of bird/wildlife-aircraft strikes. Personnel would implement applicable AFOSH and OSHA requirements during construction, renovation, and demolition projects. Emergency and mishap response plans would be updated to include procedures and response actions specific to the KC-46A and associated equipment.
Air Quality	Construction contractors would employ BMPs and environmental control measures, to the greatest extent applicable, as follows: • All stockpiles of excavated materials located within construction areas would be completely covered with tarping and sufficiently weighted down to prevent dust and material from entering other airfield pavement areas outside the barricaded area.

Resource	Sustained Compliance Actions to Avoid or Minimize Impacts on Environmental Resources
	• During construction and operation, use of electricity from the installation would be used preferentially over the use of generators. All generator use would be pre-approved by the installation Air Quality Manager and adhere to applicable permit conditions. • All non-road diesel equipment would comply with the Federal Clean Air Nonroad Diesel Rule, which regulates emissions from nonroad diesel engines and sulfur content in nonroad diesel fuel. • Dust suppression techniques would be used during construction to reduce air pollution. Recommended methods include application of water, soil stabilizers, or vegetation; use of wind break enclosures; use of covers on soil stockpiles and dump truck loads; use of silt fences; suspension of earth-movement activities during high-wind conditions (gusts exceeding 25 miles per hour), revegetation of disturbed areas, and conducting road sweeping to reduce fugitive dust and mud tracking onto roadways. • To the greatest extent feasible, measures to reduce diesel emissions would be implemented. These measures could include: switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older equipment with modern engines, replacing older vehicles, and reducing idling through operator training and contracting policies. In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EOs, the Energy Policy Act of 2005, and the DoD Strategic Sustainability Performance Plan, the DAF has a sustainability program in place for reducing CO_2e emissions through increases in energy/fuel efficiency and using renewable sources where possible.
Environmental Justice and Other Sensitive Receptors	Ongoing implementation of the sustained compliance actions identified for the Proposed Action at each installation would continue to avoid or minimize effects on populations within the project ROI at each installation, including minority and low-income populations, and other sensitive receptor populations (such as children and elderly) within those communities.

Key: MOB = Main Operating Base; BASH = Bird/Wildlife Aircraft Strike Hazard; MBTA = Migratory Bird Treaty Act; SWPPP = Stormwater Pollution Prevention Plan; INRMP = Integrated Natural Resources Management Plan; ICRMP = Integrated Cultural Resources Management Plan; ESCP = Erosion and Sediment Control Plan; EISA = Energy Independence and Security Act; DAF = Department of the Air Force; EO = Executive Order; DoD = Department of Defense; HVAC = heating, ventilation, and air conditioning; SWFWMD = Southwest Florida Water Management District; USFWS = United States Fish and Wildlife Service; FEMA = Federal Emergency Management Agency; UFC = Unified Facilities Criteria; NPDES = National Pollutant Discharge Elimination System; ISWMP = Integrated Solid Waste Management Plan; AST = aboveground storage tank; BMP = best management practice; ERP = Environmental Restoration Program; LUC = land use control; PPE = personal protection equipment; AFOSH = Air Force Occupational Safety and Health; OSHA = Occupational Safety and Health Administration; ROI = Region of Influence; CO_2e = carbon dioxide equivalent

3 Affected Environment and Environmental Consequences

3.1 Introduction

Chapter 3 describes the environmental resources and conditions most likely to be affected by the Proposed Action and alternatives, and provides information to serve as a baseline from which to identify and evaluate potential environmental impacts. **Section 3.2** describes the criteria for analysis in this chapter. The affected environment and environmental consequences are presented by resource area in the MacDill AFB and Fairchild AFB sections, **Sections 3.3** and **3.4,** respectively. The affected environments described in these sections also constitute conditions under the No Action Alternative; environmental consequences for each resource under the No Action Alternative are described in **Section 3.5**. Cumulative effects, including impacts from the Proposed Action and alternatives in combination with applicable reasonably foreseeable actions in the respective vicinities of each installation, are discussed for each resource area in **Section 3.6**. Measures identified in **Sections 2.5** and **2.6** would be implemented, as applicable to avoid, minimize, or mitigate impacts on resources at the installations.

Throughout this EIS, as applicable, the area at each installation that could be physically disturbed is referred to as the "Project Area." The term "Project Area" encompasses the locations proposed for construction and renovation described for the alternatives in **Chapter 2**. This EIS uses the term "Region of Influence" (ROI) to describe the complete geographic scope of potential consequences for the resource area. For most of the resource areas, the ROI is defined as areas of the installation impacted by aircraft operations and facility modifications. For some resources, such as noise, air quality, and socioeconomics, the ROI extends into surrounding communities unique to that specific resource.

In compliance with NEPA, CEQ, and DAF EIAP (32 CFR Part 989) guidelines, this EIS focuses on those resources potentially subject to impacts from the Proposed Action or alternatives, including the No Action Alternative. This EIS has been prepared as a concise document that addresses installation-specific concerns while meeting the comparative needs of the DAF decision makers. Public, agency, and other comments received during scoping were used to focus the analysis on those resources of interest to scoping participants. Certain resources were not carried forward for evaluation in this EIS because it was determined that beddown of the MOB 6 mission at either of the installation alternatives would be unlikely to impact those resources. The resources not carried forward for analysis in this NEPA effort and supporting rationale are included below:

Airspace Management. KC-135 aircraft operating out of MacDill and Fairchild AFBs currently use the surrounding Class C airspace and established FAA flight routes and existing installation runway and airfield infrastructure to conduct training operations. All KC-46A PAA supporting the MOB 6 mission would continue aerial refueling operations within existing airspace and training areas currently or previously used by tanker and cargo aircraft. All KC-46A would continue to follow the same flight profiles (e.g., airfield approach and departure paths). No changes in the location, size, shape, or altitudes to the existing airspace would occur. Additionally, the number of aircraft would not change as there would be one-to-one replacement of KC-135s by the KC-

46A at either installation, with 24 KC-46A replacing 24 of 24 KC-135s at MacDill AFB and 24 KC-46A replacing 24 of 48 KC-135s at Fairchild AFB. The Proposed Action and alternatives would have no impacts on existing airspace configurations (shape, size, altitudes). The way the airspace is used would not change.

The MOB 6 beddown under Alternative 1 at MacDill AFB would result in an approximately 15 percent increase in tanker aircraft operations (see **Table 2-4** for more detail), resulting in increased air traffic in the area. The MOB 6 beddown under Alternative 2 would result in an overall increase in tanker aircraft operations of approximately 29 percent at Fairchild AFB (see **Table 2-8** for more detail), resulting in increased air traffic in the area. Despite the proximity of Fairchild AFB to Spokane International Airport and MacDill AFB to Tampa International Airport, St. Pete-Clearwater International Airport, and St. Petersburg International Airport, negligible adverse impacts on commercial aircraft could occur. Although airfield operations would increase under either alternative, these operations would occur in existing space where military training procedures are established and common, and where the flight training operations in the airspace would be managed by installation air traffic control. Further, all flight training operations would be conducted in accordance with DAF and FAA flight safety regulations. As such, further analysis of impacts on airspace management is unnecessary for this EIS.

Marine Biological Resources. While MacDill AFB is immediately surrounded by marine environment on three sides, no construction would occur in the marine waters surrounding the installation. While aircraft sound has been documented as deep as 100 feet below the surface of the water (Kuehne et al 2020), the 2022 noise study contours that extend over the marine environment are between 65 and 70 decibels (dBs); less than the known thresholds that cause adverse impacts to humans and wildlife. The loggerhead sea turtle is an infrequent visitor at MacDill AFB, and there have been no documents nests along the installation beaches. The West Indian Manatee has been occasionally documented within the installation's canal system. While this species is both fresh and salt water-adapted they have not been observed in the marine waters around MacDill AFB and have generally been noted to be unresponsive to human noises. As such, no direct nor indirect impacts on marine biological resources would occur from Alternative 1. Fairchild AFB is more than 200 miles from the nearest marine environment; therefore, no direct or indirect impacts on marine biological resources would occur from Alternative 2. **Sections 3.3.2.2.2** and **3.4.2.2.2** address potential impacts on terrestrial biological resources at MacDill AFB and Fairchild AFB, respectively.

Visual Resources. Visual resources were not evaluated because the KC-46A MOB 6 beddown at either of the installation alternatives would not impact landscapes and landforms nor other features attributed to landscape-level visually aesthetic qualities. New construction and expansion and modifications of existing facilities would occur within areas already populated with similar facilities. New facilities and modifications would replicate building styles to match the surrounding facilities. Therefore, impacts on visual resources from a land use perspective are not expected, and further analysis in this EIS is unnecessary. Cultural Resources **Sections 3.3.3.2** and **3.4.3.2** address the viewshed and aesthetic impacts on historic resources at MacDill AFB and Fairchild AFB respectively from the proposed construction actions and modification of historic buildings.

3.2 Approach for Analysis

The specific criteria for evaluating the potential environmental impacts of Alternative 1, Alternative 2, and No Action Alternative are discussed in **Sections 3.3**, **3.4**, and **3.5** by resource area. The significance of an action is also measured in terms of the potentially affected environment and degree of the effects of the action (40 CFR Part 1501.3[b]). The context and intensity of potential environmental effects are described in terms of duration (short or long term), the magnitude of the impact (negligible, minor, moderate, major), and whether they are adverse or beneficial.

3.3 Alternative 1 (Preferred Alternative) – MacDill AFB

This section describes the affected environment and anticipated environmental consequences of Alternative 1, the KC 46A MOB 6 beddown at MacDill AFB and, when applicable, in areas surrounding the installation. The baseline resource conditions are described to the level of detail necessary to support analysis of the potential impacts that could result from MOB 6 beddown at MacDill AFB.

3.3.1 Noise

The ROI for the analysis of noise effects under each alternative includes the Project Area as well as the installation and the areas that fall within the boundaries of the installation's aircraft DNL contours.

3.3.1.1 Affected Environment

Aircraft Noise. For DAF NEPA documents, DNL is the primary noise metric for aircraft noise.[1] DNL is the average sound energy in a 24-hour period with a weighting added to the nighttime dBA sound levels. The 65-dBA DNL is the noise level below which all land uses are generally compatible with noise from aircraft operations. **Table 3-1** provides a general overview of recommended noise zones from aircraft operations for land use planning purposes.

[1] FAA and DoD treat nighttime noise similarly because they use the same metrics. For all states except California, FAA and DoD use the DNL as their primary noise metric to describe cumulative aircraft noise exposure. DNL adds the 10 dB weighting to nighttime events. DNL contours, and their associated affected populations, are presented in this EIS for all modeled scenarios (e.g., Baseline and the Proposed Action) for MacDill AFB (Florida) and Fairchild AFB (Washington State).

Consistent with DoD guidance, the EIS also utilized metrics other than DNL, i.e., the supplemental metrics to quantify other potential effects, such as nighttime sleep disturbance. For sleep disturbance, the supplemental metric computed was the Number of Events At or Above a Specified Threshold, or "NA" metric, with SEL as its companion (single-event) metric, and an outdoor SEL threshold of 90 dB, for the DNL nighttime period (10pm-7am). DNL at any given point on the ground is typically governed by the SEL and the numbers of daytime and nighttime events.

Table 3-1. Recommended Noise Zones for Land Use Planning

General Level of Noise	Percent Highly Annoyed	Aircraft Noise (DNL)	General Recommended Uses
Low	< 12	< 65 dBA	Noise-sensitive land uses acceptable
Moderate	12–36	65–75 dBA	Noise-sensitive land uses normally not recommended
High	> 36	> 75 dBA	Noise-sensitive land uses not recommended

Source: DAF 2017c
Key: DNL = day-night average sound level; dBA = "A"-weighted decibel

The DAF utilizes results from the NOISEMAP computer programs to describe noise from aircraft operations. NOISEMAP is a suite of computer programs and components developed by the DoD to predict noise exposure near an airfield due to aircraft flight, maintenance, and ground hrun-up operations. These programs account for all aircraft activities, including landings, takeoffs, in-flight operations, maintenance activities, and engine run-ups. NOISEMAP Version 7.3 was used to calculate the existing DNL contours at MacDill AFB based on the 2021 operational conditions at the installation. An overview of the methods used to develop aircraft noise contours is available on the project website.

Figure 3-1 shows the existing DNL contours plotted in 5 dB increments ranging from 65- to 85-dBA DNL. The existing 65-dBA DNL contour extends approximately 5,280 feet toward the northeast, into the Ballast Point neighborhood in the City of Tampa. The 65-dBA DNL contour extends approximately 6,330 feet to the southwest, over the water. The contour also extends approximately 1,740 feet to the west of the installation into residential areas where the noise exposure is dominated by Temporary Duty operations of F-18, F-15, and F-16 aircraft.

No substantial changes in operations or mission at the installation have occurred since these noise contours were developed; therefore, they have been carried forward as a comparative baseline to determine the level of impacts under NEPA. It should be emphasized that these noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide louder areas from land largely unaffected by noise. Instead, they are part of a planning tool that depicts the general aircraft noise environment around the installation based on typical aviation activities. Areas with DNL less than 65 dBA can also experience levels of appreciable noise depending upon training intensity or weather conditions. Additionally, DNL contours may vary from year to year due to fluctuations in operational tempo from unit deployments, funding levels, and other factors.

Table 3-2 presents the existing land acreage exposed to DNL greater than or equal to 65 dBA. There are 243 acres off-installation and 1,090 acres on-installation within the existing 65-dBA DNL contour. Of the acreage off-installation, 170 acres are located over the shoreline to the southwest or water, and 73 acres are located over land to the northwest and northeast of the base. There are no off-installation schools, churches, or hospitals on land within or exposed to DNL greater than or equal to 65 dBA.

Data Source: Bing Maps Aerial

Figure 3-1. Baseline Noise Contours for MacDill AFB

Table 3-2. Acreage within the Baseline Noise Contours at MacDill AFB

Noise Contour (dBA DNL)	Area Under Contours (Acres)		
	On-Installation	Off-Installation	Total
65–69	1,090	243	**1,333**
70–74	624	12	**636**
75–79	343	0	**343**
80–84	181	0	**181**
≥ 85	69	0	**69**

Key: dBA DNL = day-night average sound level measured in "A"-weight decibels

Noise Abatement Procedures. Aircraft noise abatement procedures at MacDill AFB have been designed to minimize effects on the surrounding community while maximizing operational capacity and flexibility. The high population density of the area surrounding the installation requires strict use of noise abatement procedures for arriving and departing aircraft. To reduce the effects of noise, MacDill AFB limits transient aircraft to one approach and a full stop landing between the hours of 10 p.m. and 6 a.m. Fighter aircraft are restricted to straight-in/full-stop approaches/landings after 9 p.m. Additionally, the installation controls and schedules missions to keep noise levels low, especially at night. Flight patterns specific to MacDill AFB have resulted from the following considerations:

- Takeoff patterns routed to avoid noise-sensitive areas as much as possible
- Arrivals and departures routed to avoid restricted airspace
- Criteria governing the speed, rate of climb, and turning radius for each type of aircraft
- Efforts to control and schedule missions to keep noise levels low, especially at night
- Coordination with the FAA to minimize conflict with civil aircraft operations (DAF 2017b).

3.3.1.2 Environmental Consequences

3.3.1.2.1 Analysis Methodology

Analysis in this section evaluates noise impacts and supplemental metrics for the installation and surrounding communities that would result from Alternative 1. Changes in noise are assessed for significance based on context and intensity. Noise impacts are analyzed in consideration of federal, state, and local noise ordinances and increases in areas of incompatible land use outside the installation. The detailed methodology and inputs used to develop the contours are available on the project website.

Consistent with DoD guidelines (DoD 2009), the aircraft noise analysis included the effects, metrics, and thresholds noted in **Table 3-3**. The NOISEMAP suite was used to compute the identified supplemental metrics.

The classroom learning interference analysis assumed school day hours of 8 a.m. to 4 p.m., entirely within the DNL daytime period. As the hourly distribution of operations is unknown, DNL daytime operations were assumed to be evenly distributed through the 15-hour daytime period. These operations were scaled by a factor of 0.53 (8 school day hours divided by 15 daytime hours) to convert to school day operations.

For wildlife impact analysis, the maximum sound level (L_{max}) was calculated at each wildlife monitoring site. Because the NOISEMAP suite cannot automatically compute the overall L_{max} for all flight/static profiles at once, the flight profile contributing the greatest sound exposure level (SEL) to each of several points of interest (POIs) for evaluating impacts was chosen to approximate the flight/static profile with highest overall L_{max} at that POI.

Table 3-3. Guideline Values (Outdoor Values) for Supplemental Noise Metrics

Application	Metric	Unit	Time Period	Recommended Outdoor Thresholds for Reporting Purposes
Speech Interference	NA	Number of Events	15-hr day (DNL daytime; 7am to 10 pm)	75 dB L_{max}
Sleep Disturbance	NA	Number of Events	9-hr night (DNL nighttime; 10pm to 7am)	90 dB SEL
Classroom Speech Interference	L_{eq}	Decibel	School hours (8-hr)	60 dB (for scoping)
Classroom Speech Interference	NA	Number of Events	School hours (8-hr)	75 dB L_{max}
Classroom Speech Interference	TA	Time (minutes)	School hours (8-hr)	75 dB L_{max}
Potential for Hearing Loss	PHL	Decibel	Yearly DNL (Annual Average Day)	80 dB
Wildlife Effects/impacts	L_{max}	Decibel	Overall	(species specific)

Key: NA = Number of Events (at or) Above a Specified Threshold; TA = Time (at or) Above a Maximum Sound Level; L_{eq} = equivalent sound level; PHL = potential for hearing loss; L_{max} = maximum sound level; DNL = day-night average sound level; SEL = sound exposure level; dB = decibel

3.3.1.2.2 Alternative 1

Short-term, minor, adverse impacts on the noise environment would be expected under Alternative 1 due to noise generated from heavy equipment used during construction. Long-term, minor, beneficial impacts would be expected under Alternative 1 due to a decrease in land area experiencing 65-dBA DNL of aircraft noise as compared with the KC-135 baseline.

Facility Construction and Modification. Construction, demolition, and renovation activities would require use of heavy equipment that would generate short-term increases in noise near the Project Area. **Table 3-4** presents typical noise levels (dBA at 50 feet) for the main phases of outdoor construction. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (USEPA 1971, FHWA 2006). With multiple items of equipment operating concurrently, noise levels can be relatively high within several hundred feet of active construction and demolition sites.

Table 3-4. Noise Levels Associated with Outdoor Construction

Construction Phase	L_{eq} (dBA)
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971, FHWA 2006
Key: L_{eq} = equivalent sound level; dBA = "A"-weighted decibel

All construction, demolition, and renovation activities under Alternative 1 would occur within the installation's boundary, be collocated with other existing noise-compatible activities, and end with the facility construction and modification phase. These activities would be conducted in the context of an active AFB where aircraft and other types of noise are typical. Some people living or working near the sites may notice or be annoyed by the noise. Given the temporary nature of proposed construction, demolition, and renovation, distance to nearby noise sensitive areas, and the existing noise environment, these impacts would be minor. Although construction-related noise impacts would be minor, the measures identified in **Sections 2.5** and **2.6** would be implemented to further reduce any realized noise impacts.

Aircraft Operations. **Figure 3-2** shows the baseline and projected DNL contours for Alternative 1 at MacDill AFB plotted in 5 dB increments ranging from 65 to 85 dBA DNL. The proposed 65-dBA DNL noise contour would extend approximately 3,050 feet northeast from the installation boundary into the Ballast Point neighborhood in the City of Tampa. The 65-dBA DNL contour would extend 5,930 feet southwest of the installation boundary over water along the centerline of Runway 05/23. The contour would also extend approximately 1,650 feet to the west of the installation boundary. Off-base residences and schools would be exposed to DNL greater than or equal to 65 dBA.

Alternative 1 would cause the 65-dBA DNL contour to extend approximately 900 feet to the southeast along the runway centerline and contract approximately 750 feet to the northwest along the runway centerline, compared to location of the baseline 65-dBA DNL contour. While many of the operations and the noise exposure from those operations are similar between the two scenarios, the primary difference would arise from the closed pattern profiles between the KC-135 and KC-46A. In the baseline scenario, the northerly extent of the 65-dBA DNL contour is dominated by KC-135 operations from closed patterns operating on Runways 05 and 23. For Alternative 1, it would be dominated only by the KC-46A closed pattern operations from Runway 23. KC-46A closed pattern operations on Runway 05 would climb more steeply than the baseline KC-135 operations on Runway 05, and would generate less noise exposure than the KC-135.

Data Source: Bing Maps Aerial

Figure 3-2. Noise Contours for the Proposed KC-46A Flight Operations at MacDill AFB, Florida

Table 3-5 presents the land acreage that would be exposed to DNL greater than or equal to 65-dBA DNL for Alternative 1 shown in **Figure 3-2**. There would be approximately 211 acres off-installation and 1,087 acres on-installation within the proposed 65-dBA DNL contour. Of the acreage off-installation, approximately 172 acres are located over the shoreline to the southwest or water, and 39 acres are located over land to the northwest and northeast of the base. No schools, churches, nor hospitals would be exposed to DNL greater than or equal to 65 dBA. Additionally, approximately 30 off-installation residences would no longer be exposed to a DNL of 65 dBA or higher. Because there would be an approximately 32-acre decrease in off-installation area and 3-acre decrease in on-installation area exposed to DNL greater than or equal to 65 dBA, long-term, minor, beneficial impacts on the noise environment would be expected despite the approximate 15 percent increase in operations. This decrease in land area affected by the 65 dBA would occur because the KC-46A is generally quieter than the KC-135. For further discussion of land use compatibility under the proposed DNL contours, see **Section 3.3.8**.

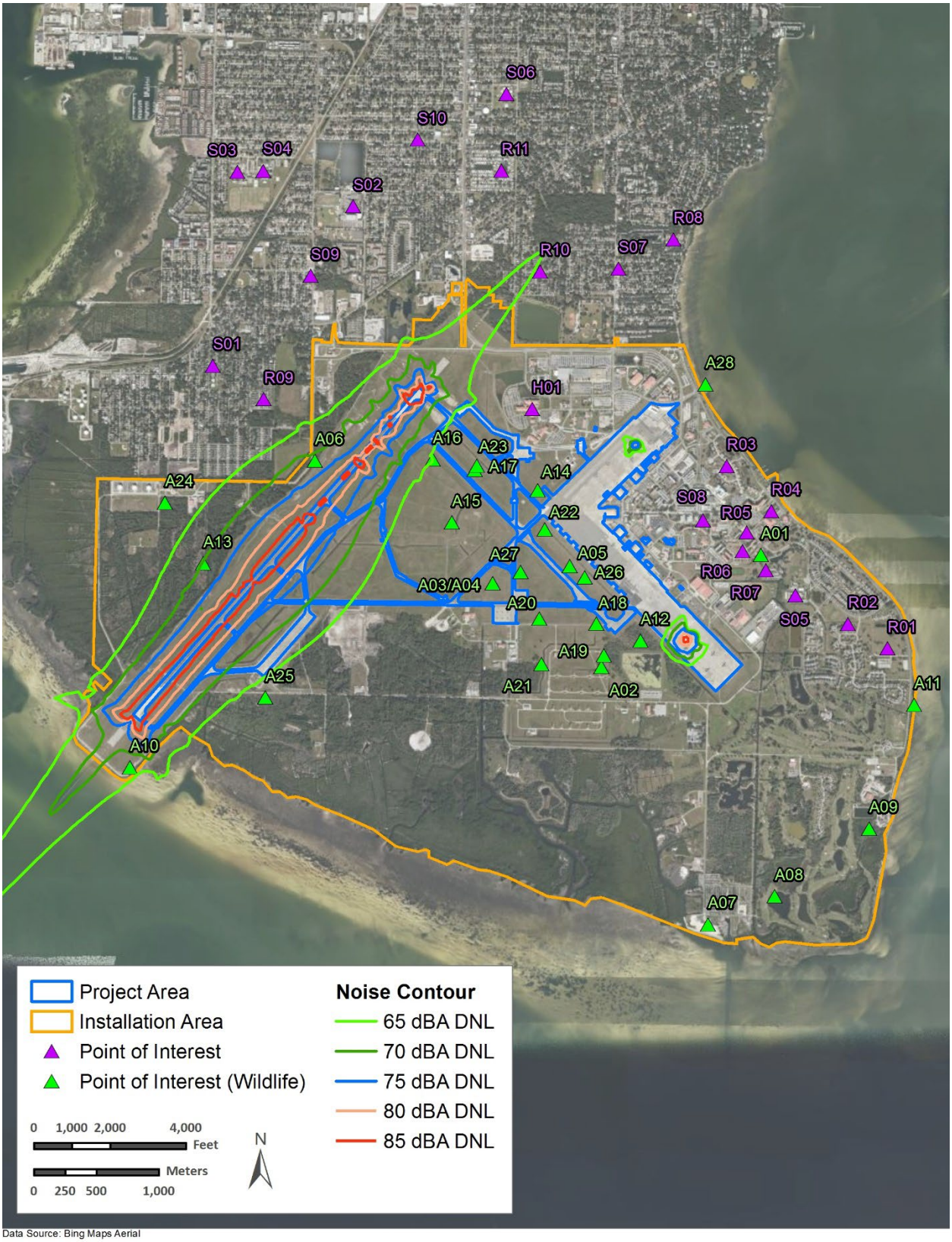
Table 3-5. Acreage within the Proposed Noise Contours at MacDill AFB

Noise Contour (dBA DNL)	Area Under Contours (Acres)		
	On-Installation	**Off-Installation**	**Total**
65–69	1,087	211	**1,298**
70–74	625	17	**642**
75–79	346	0	**346**
80–84	183	0	**183**
≥ 85	72	0	**72**

Key: dBA DNL = day-night average sound level measured in “A”-weighted decibels

Alternative Metrics. The alternative metrics required analyses of noise exposure relating to potential effects of noise, including sleep disturbance, hearing loss, classroom learning interference, and speech interference. These metrics also addressed an analysis of noise effects on wildlife. These analyses focus on specific POIs in the vicinity of MacDill AFB and are shown in **Figure 3-3**. These POI were provided by DAF and include:

- Eleven residential receptors (POIs R01 through R11)
- Ten off-base schools (S01 through S10)
- One on-base hospital (H01)
- Thirty wildlife locations
    - Two bald eagle nests (A01 and A02)
    - Fifteen gopher tortoise monitoring locations (A03, A05, A11, A12, A14, A15, A18 through A26)
    - Five Florida burrowing owl monitoring locations (A04, A13, A16, A17, A27)
    - Six multiple shorebird monitoring locations (A06 through A10, A28)
    - One West Indian manatee critical habitat (A29)
    - One piping plover critical habitat (A30)



Data Source: Bing Maps Aerial

Figure 3-3. POIs at MacDill AFB

The West Indian manatee and piping plover critical habitats are not shown in **Figure 3-3** because they are located on the south shoreline of Tampa Bay opposite from MacDill AFB and at the mouth of Tampa Bay, respectively. The bald eagle nests and shorebird monitoring locations were modeled at 50 feet above ground level (AGL). All other POI were modeled at 5 feet AGL.

Potential for sleep disturbance. For the sleep disturbance analysis, the residential and hospital POIs were used, and only nighttime operations were considered.

Under Alternative 1, as shown in **Table 3-6**, residential POI sites R08 (i.e., the Estates at Bayshore Point) and R10 (i.e., Interbay neighborhood) could potentially experience annual increases of 24 and 5 sleep disturbing events, respectively. These increases would result from the increase in nighttime closed pattern operations conducted by the KC-46A compared to the KC-135 closed pattern operations in the baseline scenario. Typically, when there is an increase in nighttime events and all other operational factors (e.g., airfield and airspace operating environment and aircraft) remain unchanged, the DNL would increase. Under Alternative 1, however, although there would be an increase in nighttime events, there would be a decrease in area experiencing the 65 dB DNL due to the proposed change in aircraft type from the KC-135 to the quieter KC-46A. In this case, the increase in the numbers of nighttime events would be negated by the decrease in SEL due to the aircraft changeout.

No changes to sleep disturbing events would be expected at the on-base residential, hospital, Port Tampa communities, or Milgwen neighborhood locations.

Table 3-6. Annual Number of Nighttime Events at or Above Outdoor 90 dB SEL

POI	ID	Baseline Annual Events	Alternative 1 Annual Events	Resulting Change in Annual Number of Events (+/-)
Family Housing	R01	0	0	0
Family Housing	R02	0	0	0
Family Housing	R03	0	0	0
Family Housing	R04	0	0	0
Family Housing	R05	0	0	0
Family Housing	R06	0	0	0
Family Housing	R07	0	0	0
The Estates at Bayshore Point	R08	65	89	24
Port Tampa Communities	R09	0	0	0
Interbay neighborhood	R10	493	498	5
Milgwen neighborhood	R11	0	0	0
MacDill Regional DAF Hospital	H01	0	0	0

Source: HMMH 2022*Classroom Learning Interference.* The classroom learning interference analysis assumed school day hours of 8 a.m. to 4 p.m., entirely within the DNL daytime period.

As shown in **Table 3-7**, only the Academy of Active Education (POI S07) has an equivalent sound level over an 8-hour period ($L_{eq(8h)}$) greater than 60 dB; the Time (at or) Above a Maximum Sound Level (TA) and Number of Events (at or) Above a Specified Threshold (NA) metrics for

this school are provided in **Table 3-8**. The Alternative 1 scenario would reduce the NA by 1,074 events (approximately 32 percent) and the TA75 by 73 minutes (approximately 15 percent) annually.

Table 3-7. School-Day $L_{eq(8h)}$

POI	ID	Baseline	Alternative 1
Westshore Elementary School	S01	57	57
Robinson High School	S02	53	53
Monroe Middle School	S03	48	48
Lanier Elementary School	S04	49	49
Tinker Elementary School	S05	46	46
Chiaramonte Elementary School	S06	51	51
Academy of Active Education	S07	61	61
MacDill School Age Program	S08	49	49
Top Kids Bilingual Preschool	S09	55	55
Sunshine Learning Center	S10	51	51

Source: HMMH 2022

Table 3-8. Annual Number of School-Day Events or Minutes (at or) Above 75 dB L_{max} for the Academy of Active Education (S07)

Supplemental Noise Metric	Baseline	Alternative 1	Resulting Change in Annual Number of Events (+/-)
NA 75 dB L_{max}	3,353 events	2,279 events	-1,074 events
TA 75 dB (L_{max})	475 minutes	402 minutes	-73 minutes

Source: HMMH 2022

Speech Interference. The speech interference analysis analyzed only the DNL daytime operations at the residential and hospital POIs.

As shown in **Table 3-9**, Alternative 1 would potentially decrease the annual number of speech interference events for three residential POI sites (R01, R08, and R10) and the hospital (H01) and would result in no change for the remaining residential sites, compared to the baseline scenario. These four POIs would experience a decrease between 19 and 1,365 events per year due to the replacement of all the KC-135 closed patterns with quieter (on a daily average) KC-46A closed pattern operations. The decrease in events at R01 would also be attributed to the replacement of KC-135 by the KC-46A since R01 is located directly under the shared “circle to 23” flight tracks. No other POIs shown in the table would experience a change in NA 75 dB L_{max} because Temporary Duty F-15, F-18 and A-10 operations, the dominant contributors to the metric, would remain unchanged for Alternative 1. The Temporary Duty aircraft mix was not updated relative to previous modeling and represents a conservative estimate.

Table 3-9. Annual Number of Daytime Events at or Above Outdoor 75 dB L_{max}

POI	ID	Baseline Events	Alternative 1 Events	Resulting Change in Annual Number of Events (+/-)
Family Housing	R01	388	369	-19
Family Housing	R02	396	396	0
Family Housing	R03	1,159	1,159	0
Family Housing	R04	904	904	0
Family Housing	R05	931	931	0
Family Housing	R06	931	931	0
Family Housing	R07	815	815	0
The Estates at Bayshore Point	R08	5,339	3,974	-1,365
Port Tampa Communities	R09	2,590	2,590	0
Interbay	R10	7,421	6,300	-1,121
Milgwen	R11	1,716	1,716	0
MacDill Regional DAF Hospital	H01	2,505	2,191	-314

Source: HMMH 2022

Noise Effects and Impacts on Wildlife. For the wildlife impact analysis, transient F-18 departures from Runways 05 and 23 would have the highest SEL at most of the wildlife POIs as shown in **Figure 3-4**. At POIs A07, A08, A09, and A11, transient A-10 aircraft conducting closed pattern operations from Runways 05 and 23 would result in the highest SEL. **Table 3-10** shows the L_{max} of the two flight profiles. See **Section 3.3.2.2.2** for the analysis of noise impacts on wildlife and protected species.

Potential for Hearing Loss. DoD policy requires that the potential for hearing loss (PHL) be calculated for populations exposed to 80 dBA DNL or greater (DoD 2009). The PHL risk for populations exposed to DNLs less than 80 dBA is not necessarily zero but is generally considered to be small. PHL is then calculated based on the equivalent sound level over a 24-hour period. As shown in **Figures 3-1** and **3-2**, the 80 dBA DNL contours for the baseline are, and Alternative 1 would be, confined within the installation boundaries and would not overlay on-installation housing or population centers, so calculation of PHL is not required for Alternative 1.

Data Source: Bing Maps Aerial

Figure 3-4. Modeled Wildlife POIs at MacDill AFB

Table 3-10. Estimated Maximum Sound Levels at Wildlife POI

Wildlife Site	ID	L_{max} (dB)
Bald Eagle Nest	A01	85
Bald Eagle Nest	A02	88
Gopher Tortoise	A03	96
Florida burrowing Owl	A04	96
Gopher Tortoise	A05	92
Multiple shorebird species	A06	115
Multiple shorebird species	A07	86
Multiple shorebird species	A08	89
Multiple shorebird species	A09	88
Multiple shorebird species	A10	111
Gopher Tortoise	A11	87
Gopher Tortoise	A12	87
Florida burrowing Owl	A13	112
Gopher Tortoise	A14	97
Gopher Tortoise	A15	102
Florida burrowing Owl	A16	109
Florida burrowing Owl	A17	103
Gopher Tortoise	A18	89
Gopher Tortoise	A19	88
Gopher Tortoise	A20	92
Gopher Tortoise	A21	90
Gopher Tortoise	A22	95
Gopher Tortoise	A23	104
Gopher Tortoise	A24	101
Gopher Tortoise	A25	105
Gopher Tortoise	A26	91
Florida burrowing Owl	A27	95
Multiple shorebird species	A28	98
West Indian Manatee Critical Habitat	A29	72
Piping Plover Critical Habitat	A30	46

Source: HMMH 2022

3.3.2 Biological Resources

The ROI for the analysis of effects on biological resources under each alternative includes the Project Area, and the installation parking aprons, taxiways, runways (**Figure 3-5**), and airspace to account for potential impacts from aircraft operations. Construction or ground disturbance is confined to the Project Area and is not associated with the expanded biological ROI beyond the Project Area; this expanded ROI is for the analysis of operational impacts only.

3.3.2.1 Affected Environment

Vegetation. MacDill AFB has seven predominant vegetation communities and land cover types. These communities include mangrove forest (13.4 percent), forest (16.4 percent), scrub and shrub wetland (1.2 percent), scrub or shrub (1.0 percent), grassland (1.1 percent), forested wetland (1.1 percent), and open water (3.6 percent). The remainder of the MacDill AFB acreage, approximately 3,543.5 acres (62.2 percent) is considered developed and barren land. With the exception of ditches and smaller watercourses, the Alternative 1 Project Area is classified as improved, semi-improved, and Bird/Wildlife Aircraft Strike Hazard (BASH)/Airfield. Vegetation in these developed and maintained areas is generally a mixture of St. Augustine grass (*Stenotaphrum secundatum*) and Bahia grass (*Paspalum notatum*) lawns and fields, landscaping, and xeriscaping (MacDill AFB 2022b). Vegetation within the airfield is maintained, and the grass is kept between 7 and 14 inches in accordance with the BASH Plan, which implements both AFI 91-202*, US Air Force Mishap Prevention Program;* and AFI *91-212, Bird/Wildlife Aircraft Strike Hazard Management Program* (MacDill AFB 2019a).

Wildlife. MacDill AFB is mostly urban with small tracts of wildlands, which limits its use by animals that require large home ranges. Native wildlife habitat quality has been degraded because of historic fire protection measures and non-native plant invasion. According to the 1992 *MacDill Air Force Base Wildlife Survey*, six wildlife habitat types are present on the installation: (1) paved runways and taxiways, and mowed lawn areas; (2) slash pine plantations; (3) pine flatwoods; (4) mixed pine and oak woodlands; (5) creeks, bays, and lagoons, and dredged channels; and (6) mangroves and high marsh (MacDill AFB 2022b).

The habitat of the improved, semi-improved, and BASH/Airfield areas within or adjacent to the Project Area provide limited food and cover for commonly occurring animals such as eastern gray squirrels (*Sciurus carolinensis*), marsh rabbits (*Sylvilagus palustris*), armadillos (*Dasypus novemcinctus*), raccoons (*Procyon lotor*), and opossums (*Didelphis virginiana*) (MacDill AFB 2019a).

Special Status Species. The ESA defines many categories of listing statuses for species. Listing statuses that apply to special status species affected by the Proposed Action include the following:

- Endangered (E) = Species federally listed as endangered
- Threatened (T) = Species federally listed as threatened
- Proposed (P) = Species has a proposed rule to list as endangered or threatened
- Candidate (C) = Substantial information exists to support proposals to list as endangered or threatened
- Under Review (UR) = Species is under review for federal listing.

There is the potential for 43 federally listed species protected under the ESA or Marine Mammal Protection Act (MMPA), state-listed species, Bald and Golden Eagle Protection Act (BGEPA) species, and Migratory Bird Treaty Act (MBTA)-protected species to occur on or near the installation. The list of special status species was developed based on data provided in the MacDill AFB Integrated Natural Resources Management Plan (INRMP), the USFWS Information for Planning and Consultation report generated for the installation, the USFWS MBTA list, and information obtained from the Florida Fish and Wildlife Conservation Commission and Florida Department of Agriculture and Consumer Services (MacDill AFB 2022b; FFWCC 2021; USFWS 2020, 2022a; FDACS 2021). **Table 3-11** lists the special status species that could occur on or near MacDill AFB.

All bird species occurring on MacDill AFB are protected under the MBTA and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, except for nonnative species (i.e., rock pigeon [*Columba livia*], European starling [*Sturnus vulgaris*], and house sparrow [*Passer domesticus*]).

As noted in **Table 3-11**, of the 43 species with the potential to occur at MacDill AFB, there are 23 federally-protected (either ESA, MMPA, or BGEPA) or state-listed as well as proposed, candidate, or under review for federal listing wildlife species that have been documented on or around MacDill AFB; however, none of these species have been documented within the Project Area. There are also 20 federally or state-protected species that have not been documented on MacDill AFB, eight of these species have the potential to occur on the installation or within the airspace above (USFWS 2022a). Of the special status species listed in **Table 3-11**, no suitable habitat occurs within the ROI. There is some marginal habitat near the Project Area for the Audubon's crested caracara; however, this species has never been documented on the installation.

No special status plant species have been documented on MacDill AFB; therefore, the species listed in **Table 3-11** are not expected to occur there and are not discussed further (MacDill AFB 2022b, FDACS 2021, USFWS 2022a).

Most of the protected bird species are associated with shoreline areas and the mangrove community, and would not be expected to occur within or near the Project Area (see Habitat Notes in **Table 3-11**). As stated earlier in this section, some federally and state-protected bird species may occur within the installation's airspace, including bald eagles. There have been three active bald eagle nests observed on the installation. Two nests were observed during a 2018-2019 survey: one south and the other southeast of the Project Area (MacDill AFB 2019b). A third active bald eagle nest was documented in the southeastern corner of the explosive ordnance detonation circle in the south-central portion of the installation in 2021. See **Figure 3-5** for locations of known bald eagle nests. Only two of the three bald eagle nests have been active in the same year. MacDill AFB maintains a bald eagle Depredation Permit issued on July 1, 2021 (USFWS 2021). There is also widely distributed, sparse, non-native milkweed that occurs on the installation. The monarch butterfly, which prefers milkweed habitat, has been documented via incidental observations, and this species could be present in the airspace.

Table 3-11. Special Status Species that Potentially Occur on MacDill AFB

Species	Status	Distribution	Habitat	Documented on MacDill?	Suitable Habitat in Project Area?
Mammals					
West Indian manatee (*Trichechus manatus*)	FE MMPA	The coastal waters of the southern Atlantic Ocean	Found in Tampa Bay and tributaries	Yes	No
Tricolored bat (*Perimyotis subflavus*)	PE	Throughout Florida, except the Keys	Prefers partially open landscapes with large trees and woodland edges	Yes	No
Birds					
Scott's seaside sparrow (*Ammodramus maritimus peninsulae*)	ST	Predominantly the northwestern edge of peninsular Florida	Primarily inhabits tidal marshes in Florida	No	No
Florida scrub-jay (*Aphelocoma coerulescens*)	FT	Throughout central peninsular Florida	Florida oak scrub and scrubby flatwoods found on prehistoric and current sand dunes	No	No
Florida burrowing owl (*Athene cunicularia floridana*)	ST	Predominantly peninsular Florida	Nests in open, mowed areas	Yes	No
Rufa red knot (*Calidris canutus rufa*)	FT	Along the coastal edges of Florida	Uses relatively undisturbed sandy beaches and tidal flats	Yes	No
Piping plover (*Charadrius melodus*)	FT	Along the coastal edges of Florida	Occurs along shorelines in winter	Yes	No
Snowy plover (*Charadrius nivosus)*	ST	Sandy beaches along the Gulf of Mexico coast	Occurs along shorelines in winter; observed along the shoreline at the MacDill AFB Family Campground in 2016	Yes	No
Little blue heron (*Egretta caerulea*)	ST	Throughout Florida	Common along shorelines, ditches, and mangroves	Yes	No
Reddish egret (*Egretta rufescens*)	ST	Coastal areas central eastern/central and southwestern	Prefers shorelines, sandbars, and shallow salt ponds	Yes	No
Tricolored heron (*Egretta tricolor*)	ST	Throughout Florida	Common along shorelines, ditches, and mangroves	Yes	No
Southeastern American kestrel (*Falco sparverius paulus*)	ST	Throughout Florida	Prefers open stands of mature pines	Yes	No

Species	Status	Distribution	Habitat	Documented on MacDill?	Suitable Habitat in Project Area?
Florida sandhill crane (*Grus canadensis pratensis*)	ST	Throughout the Florida panhandle	Inhabits freshwater marshes, prairies, and pastures	Yes	No
American Oystercatcher (*Haematopus palliatus*)	ST	Mostly along the eastern and western coastal edges	Prefers coastal shorelines, sandbars, and tidal flats	Yes	No
Bald eagle (*Haliaeetus leucocephalus*)	BGEPA	Throughout Florida	Potential for foraging and nesting on the installation	Yes	No
Eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*)	FT	Along the western and eastern coasts of Florida	Inhabits impounded and unimpounded salt and brackish marshes	No	No
Red-cockaded woodpecker (*Leuconotopicus borealis*)	FE	Throughout Florida	Prefers longleaf pine stands and occasionally slash pines	No	No
Wood stork (*Mycteria americana*)	FT	Throughout most of the Florida panhandle	Occurs regularly in freshwater and estuarine wetlands	Yes	No
Roseate spoonbill (*Platalea ajaja*)	ST	Central eastern/ western along the coast and southern coast	Forages and roosts along shorelines and mangrove systems	Yes	No
Audubon's crested caracara (*Polyborus plancus audubonii*)	FT	Southcentral Florida	Prefers wet prairies with cabbage palms, may also be found in wooded areas	No	No
Black skimmer (*Rynchops niger*)	ST	Along the coastal edges of Florida	Prefers open sandy beaches	Yes	No
Least tern (*Sternula antillarum*)	ST	Throughout Florida, mostly along the coastal edges	Forages in drainage ditches and ponds on the installation	Yes	No
Reptiles and Amphibians					
American alligator (*Alligator mississippiensis*)	FT (S/A)	Throughout Florida	Found occasionally	Yes	No
American crocodile (*Crocodylus acutus*)	FT	Along the eastern, southern, and western coasts	Prefers mangrove swamps and low-energy mangrove-lined bays, creeks, and inland swamps	No	No
Loggerhead sea turtle (*Caretta caretta*)	FT	Along the Atlantic coast and Keys	Uses beach areas for nesting	Yes	No
Green sea turtle (*Chelonia mydas*)	FT	Throughout the Florida coasts	Uses beach areas for nesting	No	No

Species	Status	Distribution	Habitat	Documented on MacDill?	Suitable Habitat in Project Area?
Eastern diamondback rattlesnake (*Crotalus adamanteus*)	UR	Throughout coastal Florida, predominantly southwestern Florida	Found in Florida pinelands	Yes	No
Kemp's Ridley sea turtle (*Lepidochelys kempii*)	FE	Scatters isolated coastal beaches	Uses beach areas for nesting	No	No
Leatherback sea turtle (*Dermochelys coriacea*)	FE	Predominantly along the Atlantic coast	Uses beach areas for nesting	No	No
Eastern indigo snake (*Drymarchon couperi*)	FT	Throughout Florida	Occurs in woody uplands	No	No
Hawksbill sea turtle (*Eretmochelys imbricata*)	FE	Along the Atlantic coast and Keys	Uses beach areas for nesting	No	No
Gopher tortoise (*Gopherus polyphemus*)	ST	Throughout Florida	Occurs in recently burned pine flatwoods	Yes	No
Gopher frog (*Lithobates capito*)	UR/ST	Throughout Florida, except the southern tip	Prefers xeric habitats, including pine, oak, and sandhills	Yes	No
Florida pine snake (*Pituophis melanoleucus mugitus*)	UR/ST	Throughout Florida	Prefers xeric pine flatwoods	No	No
Short-tailed snake (*Lampropeltis extenuata*)	UR/ST	Predominantly west central Florida	Prefers xeric pine flatwoods	No	No
Insects					
Monarch butterfly (*Danaus plexippus*)	FC	Throughout Florida	This species lays eggs on obligate milkweed plants (*Asclepia* spp.)	Yes	No
Fishes					
Giant manta ray (*Manta birostris*)	FT	Mostly southern Florida	Occasionally seen around coral reefs and fish cleaning stations	No	No
Gulf sturgeon (*Acipenser Oxyrinchus desotoi*)	FT	Mostly throughout the northern portions of Florida	Occurs in most major river systems from Mississippi River to Suwannee River (Florida), and marine waters of Central and Eastern Gulf of Mexico south to Florida Bay	No	No
Smalltooth sawfish (*Pristis pentinata*)	FE	Mostly the southern panhandle tip	Juveniles inhabit coastal areas such as estuaries, river mouths, and bays year-round	No	No

Species	Status	Distribution	Habitat	Documented on MacDill?	Suitable Habitat in Project Area?
Plants					
Brooksville bellflower (*Campanula robinsiae*)	FE	Two locations along the western central coast	Generally found in pond margins, wet prairies, or seepage areas in hardwood forests	No	No
Florida bonamia (*Bonamia grandiflora*)	FT	Predominately central Florida	Generally found in white sand scrub associated with scrub oaks and sand pine	No	No
Florida golden aster (*Chrysopsis floridana*)	FE	Mostly around Tampa	Generally found in sand pine scrub	No	No
Pygmy fringe-tree (*Chionanthus pygmaeus*)	FE	Predominately central Florida	Generally found in the xeric, coarse white sand of scrub/oak scrub	No	No

Sources: MacDill AFB 2022b; FFWCC 2021; FDACS 2021; USFWS 2020, 2022b

Key**:** BGEPA = Bald and Golden Eagle Protection Act; C = Candidate species (federal designation); E = Endangered; F = Federal; MMPA = Marine Mammal Protection Act; P = Proposed species (federal designation); S = State; T = Threatened; T (S/A) = Threatened due to similarity of appearance; UR = Under review (federal designation)

The 2019 MacDill AFB BASH Plan mitigates risk of bird/wildlife strikes around the airfield by employing strategies, including, but not limited to, wildlife dispersal procedures (e.g., pyrotechnics, effigies, lasers), aircrew briefing, coordination and communication between critical departments, and clear reporting procedures for wildlife observations and strikes (MacDill AFB 2019a). In 2015, two fatal bird strikes involved federally listed species, a rufa red knot and a wood stork. A review of 21 years of summary reports submitted as part of the Depredation at Airports permit renewal process indicated these two incidents were anomalies and no additional federally listed bird strikes were noted, which supports the conclusion that the two federally listed bird strikes were anomalies (MacDill AFB 2017, 2018a, 2019a, 2020a, 2021a, 2022c). MacDill AFB maintains a Depredation at Airports permit, renewed annually with the most recent permit issued on April 4, 2022 (USFWS 2022a). There has been one 2019 BASH instance with the American alligator that needed to be relocated from the runway so aircraft could land. American alligators that may pose a danger to the population or assets on MacDill AFB are removed by Florida Fish and Wildlife Conservation Commission-licensed trappers and/or relocated by installation personnel to natural areas of the installation (MacDill AFB 2022b).

The following species could occur in burrows or areas adjacent to the Project Area: Tricolored bat, Florida burrowing owl, eastern indigo snake, gopher tortoise, gopher frog, Florida pine snake, and short-tailed snake. Only the tricolored bat, Florida burrowing owl, gopher tortoise, and gopher frog have been documented on the installation.

The tricolored bat was documented acoustically during 2019 surveys using the USFWS range-wide Indiana bat survey guidelines methodology. A total of 51 detector-nights using eight full-spectrum Anabat Swift detectors were accomplished at MacDill AFB. Call files were scrubbed and analyzed using two programs, Kaleidoscope and Sonobat with preliminary analysis identifying calls from nine bat species totaling 107 Kaleidoscope and 21 Sonobat occurrences of the tricolored bat (TTU 2019). There is tricolored bat habitat scattered throughout MacDill AFB, including around the wooded edges surrounding the airfield. There have been no documented tricolored bat roosts or maternity colonies (MacDill AFB 2022b).

The Florida burrowing owl is considered a resident on MacDill AFB. According to a 2018-2019 survey, the Florida burrowing owl population was estimated at 15 adults, although more individuals may occur during peak nesting season. There were 32 potentially occupied owl burrows within the boundaries of the airfield at that time (MacDill AFB 2019b). Florida burrowing owls have been documented within the Project Area, but no Florida burrowing owl burrows occur within the Project Area; documented burrows do occur along the central and western airfield areas outside the Project Area. See **Figure 3-5** for locations of known Florida burrowing owl observations and habitat.

The gopher tortoise is also a resident of MacDill AFB. This species prefers dry upland habitats, including sandhills and pine flatwoods, but is also found in human-altered environments. Based on 2018-2019 surveys, there are potentially 297 occupied gopher tortoise burrows and 18 abandoned burrows; 11 of the occupied burrows were classified as juvenile tortoises. Most of the burrows were located in three distinct areas that are outside the Project Area: the airfields mowed grass areas, east and south of the Tank Farm, and south of the South Ramp.

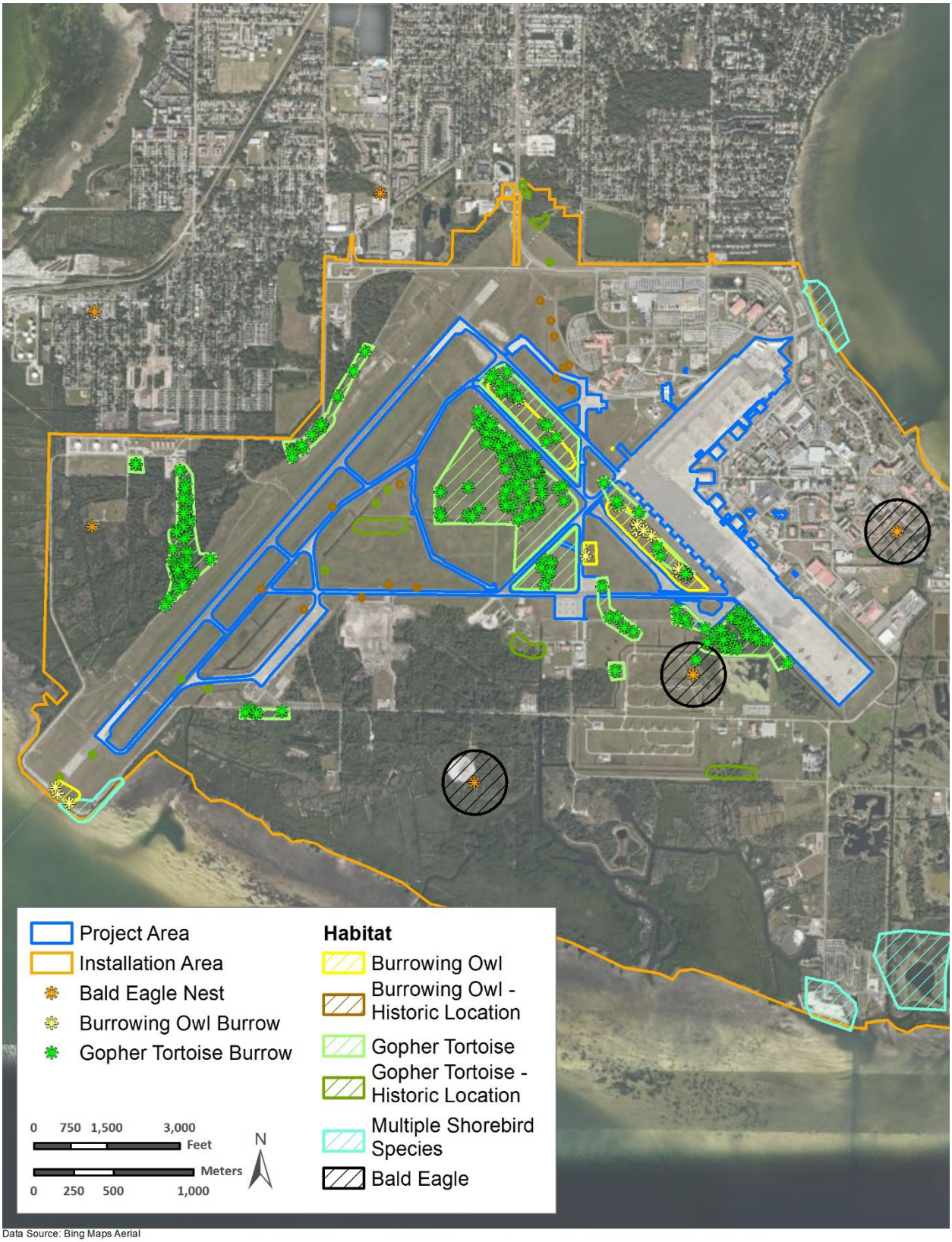


Figure 3-5. MacDill AFB Special Status Species Observations and Habitat

Gopher tortoises have started burrows near the Project Area but did not utilize the burrows. Based on the number of burrows found during these surveys, there could be as many as 149 gopher tortoises on MacDill AFB (MacDill AFB 2019b). See **Figure 3-5** for locations of known gopher tortoise observations and habitat.

The gopher frog was first documented on MacDill AFB during the 1994 Florida Natural Areas Inventory and again during the 2012 threatened and endangered species surveys. The gopher frog was not documented during the 2018-2019 threatened and endangered species surveys. Since this species prefers xeric habitats, it is unlikely to be present within the Project Area (MacDill AFB 2019b). The Florida pine snake, short-tailed snake, and eastern indigo snake could occur on MacDill AFB in association with gopher tortoise habitat. These species of snake benefit from management of gopher tortoise habitat; however, no observations of these species have occurred on the installation (MacDill AFB 2019b, 2022b).

No critical habitat for federally listed species exists on MacDill AFB (USFWS 2022b).

Wetlands. Approximately 20 percent of MacDill AFB are wetlands, with more than 500 contiguous acres of mangroves along the southern coastline of the installation. The 1,195 acres of wetlands include 880 acres of estuarine scrub/shrub emergent wetlands, which include black mangrove (*Avicennia germinans*), red mangrove (*Rhizophora mangle*), and white mangrove (*Laguncularia racemosa*); 115 acres of needle-leaved forested wetlands; and 200 acres of palustrine wetlands (MacDill AFB 2019b, 2022b). No wetlands occur on nor near the Project Area (see **Figure 3-7** in **Section 3.3.6**).

3.3.2.2 Environmental Consequences

3.3.2.2.1 Analysis Methodology

The biological resources analysis discusses impacts from construction and aircraft operations on vegetation, wildlife, special status species, and wetlands. For vegetation and wildlife, each species (common or sensitive species) has unique, fundamental needs for food, shelter, water, and space, and can be sustained only where their specific combination of habitat requirements is available. Removal of sustaining elements of a species' habitat impacts its ability to exist. Therefore, the framework for analysis of impacts on wildlife and vegetation is based on whether the action would cause habitat displacement resulting in reduced feeding or reproduction, removal of critical habitat for sensitive species, and/or behavioral avoidance of available habitat because of noise or human disturbance. The level of impacts on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern.

Determination of the significance of wetland impacts is based on (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the

duration of ecological ramifications. Impacts on wetland resources are considered significant if high-value wetlands would be adversely affected.

Potential impacts and mitigation measures identified in this document are also based on Section 7 consultations with USFWS. A letter was sent to NMFS stating a determination of no effect on species under their purview.

3.3.2.2.2 Alternative 1

Vegetation. Short- and long-term, minor, adverse impacts on vegetation would occur from temporary disturbance of vegetation and soil compaction during construction, demolition, and renovation and from permanent vegetation removal for new facilities and infrastructure under Alternative 1. Short-term impacts would occur from temporary disturbance of vegetation from the use of heavy equipment and may include trampling and soil compaction. Areas of temporary ground disturbance would be reseeded with native vegetation. Permanent removal of vegetation and trees at new construction sites would create long-term impacts from permanent reduction in cover on the installation; because areas of the Project Area are already highly disturbed from ongoing routine maintenance and landscaping activities and are of low ecological value, these impacts would be negligible to minor. These areas are not considered natural vegetation areas; therefore, no impacts on native vegetation would occur. No impacts on vegetation from the aircraft training operations under Alternative 1 are anticipated because all operational activities would occur on paved or previously disturbed surfaces or within the airspace.

Wildlife. Short-term, minor, and long-term, negligible, adverse impacts on wildlife may occur from increased noise and potential displacement associated with construction, demolition, and renovation activities. Additionally, long-term, minor, adverse impacts on wildlife would occur from a 15 percent increase in aircraft operations. Although some birds, small mammals, invertebrates, and other common small wildlife species may use the Project Area for shelter and feeding, the abundance of wildlife in these areas is low because vegetation is regularly disturbed and few native plant species occur. Additionally, the Project Area does not overlap the portions of the installation where wetlands and higher-value wildlife habitat are located, and no impacts would occur on those resources.

Short-term, minor, adverse impacts on wildlife would occur from noise associated with heavy equipment use and increased human presence during facility construction, demolition, and renovation. The increase in the frequency or intensity of noise from facility construction, demolition, and renovation could temporarily displace wildlife, and proposed construction activities would require use of heavy equipment that would generate short-term increases in noise near the area. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (see **Table 3-4**). With multiple items of equipment operating concurrently, noise levels can be high within several hundred feet of active construction sites. Wildlife species would be expected to use adjacent suitable habitat during construction and would return to the area once the noise from heavy equipment use has ceased. Furthermore, wildlife currently inhabiting the Project Area would be habituated to noise disturbances because of the existing highly urbanized environment; however, a small increase in the frequency of startle responses or other behavioral modifications caused by the proposed construction

activities could occur. No proposed construction activities would occur in areas where shorebirds or colonial nesting species are likely to nest.

Long-term, negligible, adverse impacts on wildlife would occur from the permanent loss of potential habitat for wildlife. The loss of habitat would only have negligible impacts because the proposed construction activities would occur on improved or semi-improved areas that do not provide high-quality habitat for wildlife species and consists of mowed bahia grass (*Paspalum notatum*) in the more developed areas. There would only be minimal trees cleared within the construction footprint. Removal of dead trees and vegetation, which provide habitat for birds and bats, would be permanently lost. BMPs would be followed to the greatest extent possible to reduce or avoid impacts. These BMPs would include topping trees or removing dead limbs instead of removing the entire tree, leaving as much trunk height as possible, creating artificial cavities (nest boxes), and drilling into trees to replace cavities lost during tree removal.

Birds and other animals living below the flight paths at MacDill AFB are exposed to noise from those operations year-round. Despite the anticipated 15 percent increase in aerial refueling tanker operations, as compared with the FY 2021 baseline for KC-135 flight activities, noise exposures and related impacts (such as startle responses) on wildlife would not be expected to change under Alternative 1. Transient A-10 and F-18 operations would continue to generate the highest noise levels among operating programs at the airfield.

Reviews of the effects of sound on wildlife are available (e.g., Larkin et al. 1996), and studies referenced in those reviews have documented that chronic exposure to continuous high sound levels (e.g., traffic, construction) and exposure to high sound energy impulses (e.g., sonic booms, aircraft overflight) can cause physical damage and hearing impairment; physiological effects; and changes in behavior, habitat use, and possibly reproduction. The most likely, detectable response of wildlife to aircraft operations at MacDill AFB could be a temporary change in behavior, such as flushing or some other “startle” response. Birds and other wildlife have however been documented to become habituated to aircraft overflights and other noises after continuous or frequent exposure.

The MacDill AFB BASH Plan would continue to implement procedures and actions to minimize the potential for wildlife strikes for all airfield operations. MacDill AFB would also update their BASH Plan to incorporate KC-46A operations to minimize the risk of bird/wildlife-aircraft strikes.

Special Status Species. Implementation of Alternative 1 would result in short-term, minor, adverse impacts to federally and state protected species from increased noise and potential displacement due to actions associated with construction, demolition, and renovation as well as long-term, minor, adverse impacts from the slightly increased BASH risk as a result of the proposed KC-46A aircraft operations. Impacts relating to noise exposures on special status species would be unchanged from existing conditions and similar to those described in the **Wildlife** section. Additionally, the federally and state-listed bird species could occur in the airspace. As described in the **Wildlife** section above, an increase in air operations associated with Alternative 1 is anticipated and all BASH procedures would continue to be implemented.

Potential noise impacts on marine species from aircraft operations is addressed in the beginning of **Chapter 3**; no in-water construction and other direct or indirect impacts from construction are

expected. Aircraft sound is reflected off water, and marine species do not experience the same level of sound as terrestrial species. Therefore, no impacts from implementation of Alternative 1 would occur.

In accordance with the MBTA and EO 13186, construction activities, including renovation and demolition, associated with Alternative 1 would be completed in a manner that would avoid or minimize adverse effects on migratory birds as much as possible. Although the 2015 data indicate that the potential exists for aircraft to strike federally listed bird species at MacDill AFB, these occurrences appear to be extremely infrequent. Continued adherence to and emphasis on BASH program compliance would control the potential loss of human life due to bird-aircraft collisions. MacDill AFB would continue to implement mitigation measures recommended in the Florida's Imperiled Species Management Plan 2016-2026 and the MBTA, to reduce or avoid potential construction impacts on migratory birds:

- Groundbreaking construction activities or tree-cutting activities would be performed before migratory birds return to MacDill AFB or after all young have fledged to avoid incidental take.
- If construction is scheduled to start during the period when migratory birds are present, a qualified biologist would conduct site-specific survey for nesting migratory birds immediately prior to construction (FFWCC 2016).
- If nesting birds are found during the survey, buffer areas would be established around nests. Construction would be deferred in buffer areas until birds have left the nest. A qualified biologist would confirm that all young have fledged.

Long-term, noise exposures on special status species would be unchanged from existing conditions. The special status species near MacDill AFB have continuously been exposed to frequent daily aircraft operations. Therefore, these species are likely habituated to aircraft operations and would not generally react to operational noise.

State-listed species that could experience short-term, negligible, adverse impacts from noise during construction include Scott's seaside sparrow, southeastern American kestrel, Florida sandhill crane, least tern, snowy plover, little blue heron, reddish egret, tricolored heron, American oystercatcher, Roseate spoonbill, black skimmer, gopher frog, Florida pine snake, and short-tailed snake. Noise impacts would be similar to those described in the **Wildlife** section above. Long-term, minor, adverse impacts would occur from the approximate 15 percent increase in aircraft operations. The impacts on state-listed bird species would be similar to those described for federally listed birds. Suitable habitat for the Florida burrowing owl, Florida pine snake, and short-tailed snake occur near the Project Area; however, no burrows occur within the Project Area.

Impacts on the eastern diamondback rattlesnake are anticipated to be similar to those described for federally and state-listed species.

The DAF consulted with the USFWS under Section 7 of the ESA for Alternative 1. A biological assessment was submitted in November 2022 describing the DAF's determination that Alternative 1 may affect, and would be likely to adversely affect, the federally listed rufa red knot and wood stork because two fatal 2015 strikes have previously occurred (in 2015), and

therefore, there is the potential for future strikes to occur. Additionally, the DAF determined that Alternative 1 may affect, but is not likely to adversely affect, the federally protected American alligator, Audubon's crested caracara, eastern black rail, eastern indigo snake, Florida scrub-jay, monarch butterfly, piping plover, red-cockaded woodpecker, tricolored bat, and West Indian manatee because these species could be present within the Project Area and experience intermittent construction or operational noise and emissions from the Proposed Action. Alternative 1 would have no effect on the American crocodile, giant manta ray, gulf sturgeon, or smalltooth sawfish, and federally listed sea turtle and plant species. Prior to USFWS delisting of the gopher tortoise candidate status on October 12, 2022, DAF initiated consultation with the USFWS liaison on MacDill AFB. Because this species is a state listed species the occurs in the vicinity of the Project Area, the decision was made to keep the species discussion within the biological assessment. On April 7, 2023, MacDill AFB received a biological opinion on the Proposed Action for MacDill AFB issued by the USFWS. The biological opinion (FWS Log #: 2022-0052141) includes USFWS concurrence with the DAF's effects determinations, provides recommended conservation measures for the rufa red knot and wood stork, and is on file in the EIS Administrative Record.

A courtesy letter was submitted to NMFS in November 2022 (see **Appendix A**) stating a determination of no effect on the giant manta ray, Gulf sturgeon, smalltooth sawfish, and all federally listed sea turtles. On January 17, 2023, MacDill AFB received confirmation that no Section 7 consultation with NMFS was necessary because all potentially impacted species had a "no effect" determination.

Wetlands. No wetlands occur within the Project Area (see **Figure 3-7** in **Section 3.3.6**); therefore, wetlands would not be impacted by Alternative 1.

3.3.3 Cultural Resources

Section 106 of the NHPA requires federal agencies to assess the potential effects of their undertakings on historic properties (defined below) within the respective Area of Potential Effects (APE). The APE is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR Part 800.16[d]). Potential effects include those caused by the project, occurring at the same time and place as the project (direct), and those caused by the project later in time or farther removed in distance (indirect). The scale and nature of the undertaking informs the limits of the APE. The DAF is consulting under Section 106 of the NHPA with the appropriate SHPO for each installation and with federally recognized Native American tribes.

Under the NHPA and its implementing regulations, the term "historic property" is applied to any archaeological or historic district, site, building, structure, or object that is eligible for inclusion or listed in the National Register of Historic Places (NRHP). Historic properties also include properties of traditional religious and cultural importance to a Native American tribe and that meet the NRHP Criteria for Evaluation. Historic properties are generally 50 years of age or older, are historically significant under the NRHP criteria, and retain sufficient integrity to convey their historic significance. As a part of the NHPA Section 106 process, the DAF has defined the undertaking as the Proposed Action, and has defined the APE to include the Project Area and a 0.25-mile radius around proposed new aboveground facilities and facilities undergoing exterior

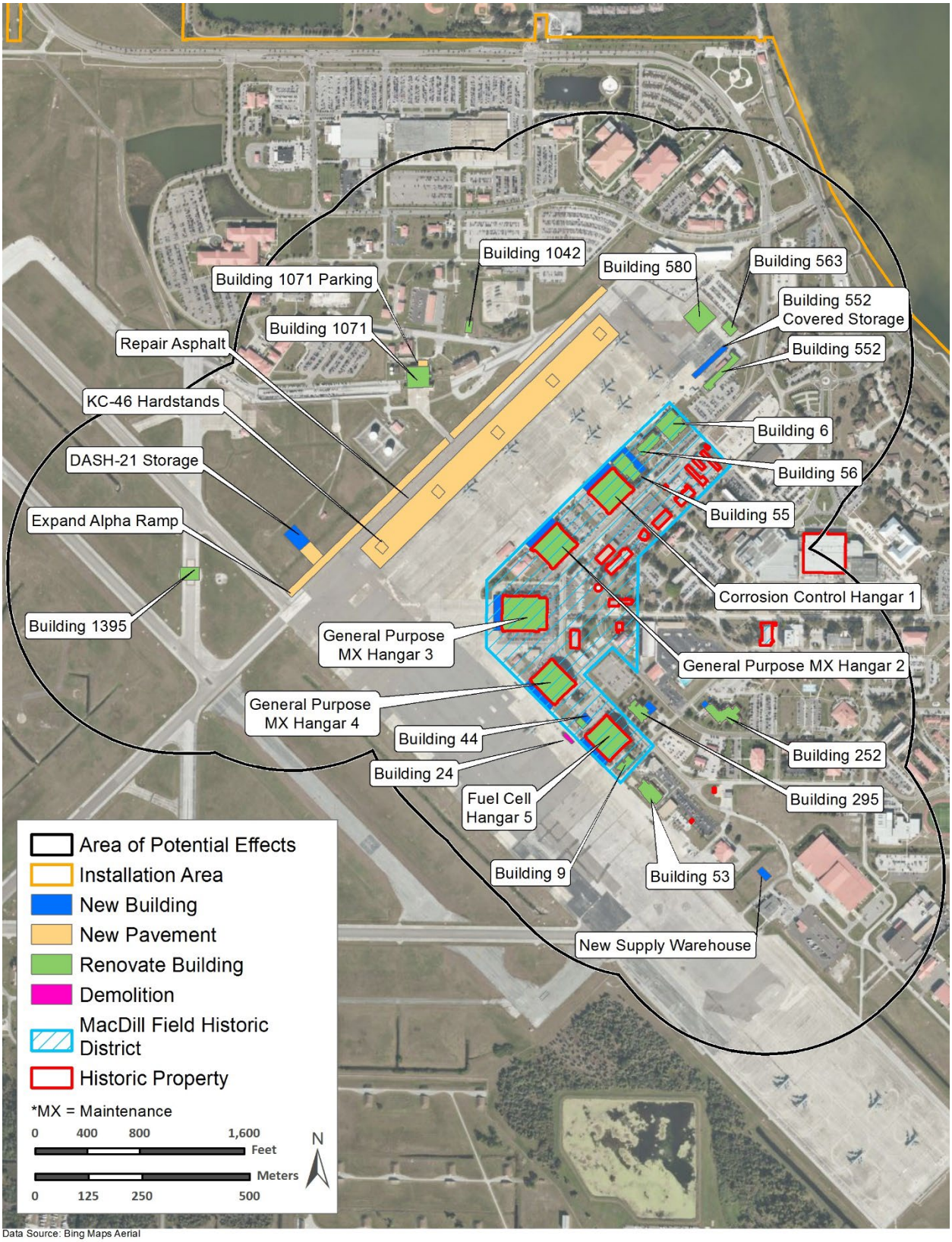
renovations to assess potential visual effects. The ROI for cultural resources is the same as the under Section 106 of the NHPA, as amended.

3.3.3.1 Affected Environment

Architectural Resources. The Integrated Cultural Resources Management Plan (ICRMP) for MacDill AFB is the guidance document for considering architectural resources during planning and implementing proposed activities at the installation. The ICRMP summarizes the results of multiple architectural inventories that have been conducted on MacDill AFB since 1952. Past architectural resources surveys at MacDill AFB have identified two historic districts and 28 facilities that are eligible for listing in the NRHP either as individual properties or contributing elements within a historic district. Of the previously identified historic properties on MacDill AFB, the MacDill Field Historic District; and Hangars 1, 2, 3, 4, and 5 within the MacDill Field Historic District (which are considered individually eligible for listing in the NRHP are located within the APE. The MacDill Field Historic District currently contains 36 buildings and structures, as noted below and shown in **Figure 3-6**.

Previous cultural resources surveys performed in 1993 and 1994 at MacDill AFB identified the MacDill Field Historic District, which is located entirely in the APE. In 1993, the Florida Division of Historical Resources, which serves as the SHPO, concurred with the recommendation that five hangars (Hangars 1, 2, 3, 4, and 5) built in 1941 were individually eligible for listing in the NRHP under Criterion A for their association with the World War II training effort and Criterion C for their Art Deco design details. The five hangars were identified as the focal point of the MacDill Field Historic District, which also includes associated buildings and structures. In 1994, a total of 39 contributing resources were identified in the MacDill Field Historic District, in addition to Hangars 1, 2, 3, 4, and 5. A total of 22 of the contributing resources identified in 1994 were demolished between 1996 and 2020. The district boundaries were revised in 2011 in consultation with the Florida Division of Historical Resources, due to the multiple demolitions on the periphery of the original district boundaries (MacDill AFB 2021b). The MacDill Field Historic District currently comprises 22 contributing resources (Hangars 1, 2, 3, 4, and 5, and 17 support buildings/structures) and 14 non-contributing resources.

The proposed undertaking would require alterations and/or additions to 20 buildings, 11 of which are historic-age (50 years of age or older). Ten of the buildings identified for alterations and/or additions are within the current boundaries of the MacDill Field Historic District (Buildings 6, 9, 44, 55, and 56, and Hangars 1, 2, 3, 4, and 5). Five of those buildings (Buildings 6, 9, 44, 55, and 56) are non-contributing buildings to the MacDill Field Historic District and have been determined not individually eligible for listing in the NRHP. The remaining five buildings located in the MacDill Field Historic District (Hangars 1, 2, 3, 4, and 5) are considered contributing to the district and are each individually eligible for listing in the NRHP (see **Table 3-12**). In addition to the buildings identified for alterations and/or additions, Building 24, which is located outside the MacDill Field Historic District, has been identified for demolition to accommodate modifications to Hangar 5. Building 24 has been determined to be not eligible for listing in the NRHP.



Data Source: Bing Maps Aerial

Figure 3-6. Historic Resources in the MacDill AFB APE

Of the seven historic properties in the APE, the undertaking would involve alterations and/or additions to Hangars 1, 2, 3, 4, and 5. Hangars 2 and 3 (chosen as the representative examples among Hangars 1, 2, 3, 4, and 5, which are identical in construction) were respectively recorded in Level I and II Historic American Building Survey (HABS) reports in 1996. HABS documentation, ranging from Level I to Level IV, has been completed for all contributing resources in the district (MacDill AFB 2021b). **Table 3-12** lists MacDill Field Historic District individually eligible and contributing buildings and structures, and the HABS level completed for each.

Table 3-12. MacDill Field Historic District Contributing Buildings and Structures

Building ID	Description	Year Built	NRHP Eligibility	Completed HABS Level
Hangar 1	Hangar	1941	Individually Eligible, Contributing	III
Hangar 2	Hangar	1941	Individually Eligible, Contributing	I
Hangar 3	Hangar	1941	Individually Eligible, Contributing	I
Hangar 4	Hangar	1941	Individually Eligible, Contributing	III
Hangar 5	Hangar	1941	Individually Eligible, Contributing	III
Building 11	Warehouse	1941	Contributing	III
Building 12	Maintenance Shop	1941	Contributing	III
Building 26	Fire Station	1941	Individually Eligible, Contributing	I
Building 27	Photographic and Mapping Facility	1941	Contributing	II
Building 28	Storage Shed	1942	Contributing	II
Building 29	Warehouse	1941	Contributing	II
Building 30	Quartermaster, Warehouse, Commissary	1941	Individually Eligible, Contributing	I
Building 31	Maintenance Shop	1941	Contributing	III
Building 32	Maintenance Shop	1941	Contributing	III
Building 33	Maintenance Shop	1941	Contributing	III
Building 34	Civil Engineering Storage Shed	1941	Contributing	III
Building 35	Maintenance Shop	1941	Contributing	II
Building 37	Water Tower	1941	Contributing	IV
Building 41	Theater	1941	Individually Eligible, Contributing	I
Building 42	Building 42	1942	Contributing	II
Building 45	Vehicle Fuel Station	1942	Contributing	III
Building 68	Storage Shed	1941	Contributing	III
Building 347	Civil Engineering	1944	Contributing	III

Key: NRHP = National Register of Historic Places; HABS = Historic American Building Survey

Archaeological Resources. The ICRMP for MacDill AFB is the guidance document for considering archaeological resources during planning and implementing proposed activities at the installation. The ICRMP summarizes the results of the two installation-wide archaeological studies that have taken place at MacDill AFB since 1952. The National Park Service conducted

the first comprehensive archaeological study of MacDill AFB in 1986. The assessment concluded that 59 percent (3,313 acres) of the installation, including airfield and cantonment areas, had been developed to the maximum, and an additional 10 percent (560 acres) had been completely disturbed by development of recreational areas (MacDill AFB 2021b). Based on concerns from the Florida SHPO representative and Seminole Tribe of Florida regarding the thoroughness of the 1986 survey, MacDill AFB completed a base-wide Phase I archaeological survey in two field sessions between 2017 and 2019.

Archaeological surveys at MacDill AFB have identified 50 archaeological sites. Of these 50 archaeological sites, 43 were determined not eligible for listing in the NRHP, 5 were determined eligible for listing in the NRHP, and two are currently undergoing evaluation to determine their NRHP eligibility. One of the NRHP-eligible archaeological sites contains ancestral remains (see below for more information). None of the previously identified archaeological sites however are located in the APE and, as such, no ground disturbing activities would occur near any known archaeological sites under Alternative 1.

Traditional Resources. MacDill AFB regularly consults with four federally recognized Native American tribes with ancestral ties to the installation lands as part of the NEPA and Section 106 processes. Those tribes are the Seminole Tribe of Florida, Miccosukee Tribe of Indians of Florida, Seminole Nation of Oklahoma, and Muscogee (Creek) Nation. MacDill AFB is consulting with these tribes for Alternative 1 at MacDill AFB (see **Appendix A**).

Ancestral remains have been found at two locations at MacDill AFB (MacDill AFB 2021b). One of those locations is within the boundaries of an archaeological site determined NRHP-eligible under Criterion D; however, the site has not been evaluated for significance as a Traditional Cultural Property (TCP). The known locations of ancestral remains at MacDill AFB are outside the APE, and no ground disturbing activities would occur near those sites under Alternative 1. No other tribal sacred sites or properties of traditional religious or cultural importance have been identified on MacDill AFB during previous consultations.

3.3.3.2 Environmental Consequences

3.3.3.2.1 Analysis Methodology

The cultural resources analysis discusses direct and indirect effects on archaeological resources; architectural resources; and resources of traditional, cultural, or religious significance under Section 106 of the NHPA, and anticipated impacts under NEPA. In accordance with NHPA Section 106, adverse effects can result from physically altering, damaging, or destroying all or part of a historic property, or introducing visual, atmospheric, or audible elements that are out of character with the property or alter its setting or feeling. The analysis focuses on historic properties that are listed or eligible for listing in the NRHP and incorporates the DAF's findings of effect under Section 106 of the NHPA. Potential impacts and mitigation measures identified in this document are based on the result of the ongoing Section 106 consultations with the SHPO and tribes.

Impacts on historic properties are considered significant if they would result in the loss of their eligibility, usually by compromising the property's historic integrity, which is the ability of a property to convey its significance. To be considered eligible for the NRHP, a cultural resource

must possess significance, and the majority, if not all, of seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association.

3.3.3.2.2 Alternative 1

Architectural Resources. Under NEPA, short-term, negligible, adverse impacts on historic properties would occur and include temporary atmospheric (visual, noise, and vibration) impacts as a result of construction activities; and long-term, major, adverse impacts would occur due to additions to and renovation of historic properties as well as introduction of new buildings and structures within the MacDill Field Historic District.

Under Section 106 of the NHPA, the undertaking would involve additions to Hangars 1, 2, 3, 4, and 5, which the DAF determined would adversely affect the individual properties and the MacDill Field Historic District to which they contribute. The historic hangars are too small to safely fit the KC-46A airframe, necessitating the proposed additions. The historic hangars are the most prominent elements in the MacDill Field Historic District, and changes to their façade as well as overall size and footprint would be out of character and, therefore, would be considered an adverse effect under Section 106.

While specifications for the proposed additions are unknown at this time, the additions would extend the entire width and height of each hangar on the flightline side to create enough space for the KC-46A to be housed in the hangars. The addition on each hangar is anticipated to be approximately 11,000 square feet. The existing hangar doors, which had been previously replaced in consultation with the Florida SHPO, would be reused as part of the alterations. The additions would change the historic appearance and diminish the hangars' integrity of design, materials, workmanship, and feeling, impacting their ability to convey significance as World War II-era, Art Deco-style hangars, although the hangars' integrity would be retained where possible. To minimize adverse effects, the additions would be designed to mimic the roofline and general historic appearance of the hangars. The exterior finishes would however be differentiated from the historic finishes to be consistent with Standard 9 of the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, such as different types of concrete wainscoting and corrugated metal wall panels. To accommodate the addition to Hangar 5, Building 24, which is not a historic building, would be demolished. In correspondence with the SHPO dated August 19, 2022, they indicated that no effects on historic resources would be expected from demolition of Building 24. To support the consultation process, three-dimensional renderings of the hangars would be provided to the SHPO per their request. It is anticipated that the adverse effects on architectural resources under Section 106 that would result from Alternative 1 would be mitigated by implementation of the Memorandum of Agreement (MOA) developed and signed by the DAF and Florida SHPO in June 2023. Therefore, the resulting long-term impacts would be reduced to moderate. Additionally, the proposed additions would be exempt from floodplain compliance requirements that would otherwise relocate or reconstruct the facilities to increase the underlying elevations under International Existing Building Code, Chapter 5, Section 507.3 (International Code Council 2021).

Throughout the EIS process, the DAF conducted NHPA Section 106 consultation with the Florida SHPO. As described above, the DAF and Florida SHPO developed and signed an MOA

for the Proposed Action in June 2023 that would be implemented to mitigate adverse impacts on architectural resources under Alternative 1 (**Appendix A**). The Advisory Council on Historic Preservation (ACHP) declined to participate in the Section 106 consultation at this time in a letter dated May 17, 2022 (**Appendix A**). The letter stated that ACHP would reconsider their decision if the SHPO, tribal representatives, or consulting parties requested ACHP's participation over the course of the Section 106 consultation process. The DAF sent the ACHP a courtesy letter on June 26, 2023 alerting them to the development and signature of the MOA with the Florida SHPO. The DAF received a response letter from the ACHP on 27 July 2023 confirming receipt of the courtesy letter and acknowledging the signed MOA.

Archaeological Resources. No known archaeological resources occur within the APE for Alternative 1. Therefore, Alternative 1 would have no impacts on known archaeological resources. Should any inadvertent discovery occur during construction or demolition, the standard operating procedures for inadvertent discoveries of archaeological resources outlined in the installation's ICRMP would be implemented.

Traditional Resources. No known traditional cultural resources or sacred sites have been identified within the APE through consultation with the tribes. The known locations of ancestral remains at MacDill AFB are outside of the APE and would not be affected by Alternative 1. The DAF is continuing to consult with the federally recognized tribes over the course of the Section 106 and NEPA processes. A summary of tribal communications for the Proposed Action is included in **Table A-4** of **Appendix A**.

3.3.4 Socioeconomics

The ROI for analysis of effects on socioeconomics under each alternative includes the county populations and communities that encompass the Proposed Action. City and state data are also provided for additional information and to serve as areas of comparison. Data used to assess socioeconomic impacts in this EIS include the 2020 Decennial U.S. Census (USCB 2022a), American Community Survey 5-Year Census Estimates for 2016–2020 (USCB 2020a), and 2010 U.S. Census. Data collected from previously published documents issued by federal, state, and local agencies and from state and national databases are also used.

3.3.4.1 Affected Environment

Under Alternative 1, the socioeconomics ROI is Hillsborough County, Florida. The City of Tampa and the State of Florida population and community details are provided for comparison.

Population. The 2020 population of Hillsborough County was 1,459,762, which represents an 18.7 percent increase since 2010. During this time, the populations of the City of Tampa and State of Florida also increased at 14.7 percent and 14.5 percent, respectively (USCB 2022a, 2022b). **Table 3-13** shows the total population data for 2010 and 2020.

Table 3-13. Total Population in the MacDill AFB Vicinity

Geographic Area	2010	2020	Percent Change (2010–2020)
Florida	18,801,310	21,538,187	14.5
Hillsborough County	1,229,226	1,459,762	18.7
City of Tampa	335,709	384,959	14.7

Source: USCB 2022a, 2022b

As presented in **Table 2-3,** the current workforce population of MacDill AFB is 24,018, including military and civilian personnel and dependents. Additionally, MacDill AFB supports more than 37,885 retirees and spouses of military retirees residing within 50 miles of the installation (MacDill AFB 2019c).

Economic Activity (Employment and Earnings). In 2020, the percentage of people in the armed forces in the Hillsborough County labor force was 0.5 percent. People in the armed forces comprised similar percentages of the labor forces of Tampa (0.8 percent) and Florida (0.4 percent) (see **Table 3-14**) (USCB 2020a). The table also shows the regional employment by industry in the MacDill AFB vicinity. The total number of employed people in the civilian labor force in Hillsborough County in 2020 was 714,057. The industry employing the highest percentage of the civilian labor force in Tampa and Hillsborough County was educational services, and health care and social assistance industry. This industry employed similar percentages of the labor force in each of these areas at 23.2 and 21.7 percent, respectively.

Table 3-14. Employment by Industry in the MacDill AFB Vicinity

	City of Tampa	Hillsborough County	Florida
Population 16 years and over in the labor force	211,716	758,405	10,308,068
Percent of labor force in the Armed Forces	0.8	0.5	0.4
Population of employed persons in the civilian labor force	197,045	714,057	9,684,712
Percent Employed Persons in Civilian Labor Force (by Industry)			
Agriculture, forestry, fishing and hunting, and mining	0.3	1.0	0.9
Construction	6.3	7.2	7.9
Manufacturing	4.7	5.1	5.1
Wholesale Trade	2.9	2.7	2.6
Retail Trade	10.0	11.3	12.5
Transportation and warehousing, and utilities	4.3	5.4	5.8
Information	1.8	1.8	1.7
Finance and insurance, and real estate and rental and leasing	11.6	10.7	7.7
Professional, scientific, and management, and administrative and waste management services	16.3	15.1	13.3
Educational services, and health care, and social assistance	23.2	21.7	12.1

	City of Tampa	Hillsborough County	Florida
Arts, entertainment, and recreation, and accommodation and food services	11.3	10.0	12.0
Other services, except public administration	4.3	4.5	5.3
Public administration	3.2	3.4	4.3

Source: USCB 2020a

The industry employing the highest percentage of the civilian labor force in Florida, at 13.3 percent, was professional, scientific, and management, and administrative and waste management services (USCB 2020a). The top private employers in the Tampa Bay area are BayCare Health System, Publix Supermarkets, Inc., HCA West Florida (hospital network), and the University of South Florida, while the top public employer is the School District of Hillsborough County (*Tampa Bay Business Journal* 2021).

The total economic impact of MacDill AFB during FY 2019 was approximately $3.9 billion. This includes payroll for military and civilian personnel of more than $2.5 billion, creation of 16,334 jobs with an estimated value of approximately $813 million, and total expenditures of approximately $586 million (MacDill AFB 2019c).

The per capita income in Tampa, Hillsborough County, and Florida was $37,834, $33,616, and $32,848, respectively (USCB 2020a). As of January 2022, the unemployment rate (not seasonally adjusted) in Tampa, Hillsborough County, and Florida was 3.5, 3.3, and 3.5 percent, respectively (BLS 2022a).

Housing. Three housing options are available for MacDill AFB personnel, including on-installation housing, privatized military family housing and unaccompanied housing, and off-installation housing. MacDill AFB has 572 privatized military family housing units located in five neighborhoods on the installation, with a current occupancy rate of 98 percent. There are five on-installation dormitories, with 375 beds for unaccompanied personnel. The dormitory occupancy rate is 97 percent (MacDill AFB 2019d).

The U.S. Census Bureau estimated nearly 600,000 housing units were within Hillsborough County in 2020, of which approximately 50,000 were vacant at a vacancy rate of 8.6 percent. The City of Tampa had approximately 175,000 total housing units, of which more than 15,000 were vacant at a vacancy rate of 10.0 percent. The homeowner vacancy rates in Hillsborough County and the City of Tampa were 1.5 percent and 2.2 percent, respectively, while the rental vacancy rates were 6.1 percent and 5.7 percent, respectively (see **Table 3-15**; USCB 2020a).

Table 3-15. Off-Installation Housing Units in the MacDill AFB Vicinity

Geographic Area	Total Units	Vacant Units	Percent Vacant
Hillsborough County	590,714	50,795	8.6
City of Tampa	174,041	17,336	10.0

Source: USCB 2020a

Education. The School District of Hillsborough County has 146 elementary schools, 46 middle schools, 38 senior high schools, and 44 combination schools (Florida DOE 2021). In the

2020-2021 school year, the total student enrollment (pre-kindergarten through grade 12) was approximately 224,149 students (Florida DOE 2022). Public school options for children living on MacDill AFB include Tinker K-8 School, which is on-installation, and Robinson High School. Both schools are part of the School District of Hillsborough County. In the 2021-2022 school year, Tinker K-8 School had 633 students, and Robinson High School had 1,420 students (Florida DOE 2022).

To provide support for personnel with younger dependents, MacDill AFB operates three child development centers and a family childcare program (MacDill FSS 2022).

Public Services. Public services in Hillsborough County consist of law enforcement, fire protection, emergency medical services, and medical services. The Tampa Police Department provides law enforcement services for the City of Tampa and has criminal investigations, special operations, and support services divisions. The other law enforcement agency in the area is the Hillsborough County Sheriff's Office. Tampa Fire Rescue provides fire prevention, fire protection, fire suppression, and emergency medical services as well as hazardous materials response, aircraft rescue, and marine firefighting. Several hospitals are within the Tampa Bay region.

Base Services. Law enforcement services (police) at MacDill AFB are provided by the 6th Security Forces Squadron; fire protection and rescue services are provided through the 6th Civil Engineer Squadron, which is part of the 6th Mission Support Group. The 6th Medical Group operates the medical clinic, urgent care clinic, and pharmacy at MacDill AFB as well as a satellite clinic (Sabal Park Clinic) in Tampa, Florida, for active-duty personnel, dependents, and retirees. The 6th Medical Group offers primary/family health care, pediatrics, general surgery, flight medicine, dental, pharmacy, chiropractic, optometry, ophthalmology, nutrition, dermatology, physical therapy, mental health, laboratory services, and more (6 MDG 2021). Tampa Fire and Rescue provides 24-hour ambulance service on the installation. Other installation services are under the direction of the 6th Force Support Squadron, including operation of a dining facility and other on-installation dining establishments, a fitness center, other recreational facilities, and provision community and family support services to installation personnel. The closest emergency room to MacDill AFB is at HCA Florida South Tampa Hospital, which is approximately 5.5 miles from the installation.

3.3.4.2 Environmental Consequences

3.3.4.2.1 Analysis Methodology

Impacts on socioeconomics were assessed to determine if Alternative 1 would result in a substantial change in the local or regional population, housing, education, public services, or installation services from increased or decreased demands of the population change, or a substantial change in the local or regional economy, employment, or business volume.

3.3.4.2.2 Alternative 1

Long-term, negligible adverse impacts on population, housing, and education at MacDill AFB would occur due to an approximately 1.2 percent increase in installation personnel and associated dependents (including school-aged children) under Alternative 1. A portion of the incoming KC-46A population would be housed in units that would be vacated by the outgoing

KC-135 mission personnel and associated dependents. More than negligible adverse impacts would not be expected from this population increase because the installation's built and social environments currently have sufficient capacity to support approximately 40,000 personnel and dependents. Less than a 0.1 percent increase in student demand in the School District of Hillsborough County would be anticipated.

The net increase in population by 283 full time military personnel and dependents would not result in appreciable effects on the installation's or on Hillsborough County's demand for law enforcement, fire protection, emergency medical services, or medical care.

Short-term, minor, beneficial economic impacts would also be generated through local construction employment and project-related spending for the proposed infrastructure and utility upgrades. Long-term, negligible, beneficial impacts on local economic activity would be expected due to increased spending (purchase of goods and services, and increased tax revenue) by the additional KC-46A mission personnel and dependents. This would provide negligible direct and indirect economic benefits.

3.3.5 Soils and Geology

The ROI for the soils and geology resources analysis in this EIS is limited to the Project Area where construction, demolition, and renovation are proposed to occur for each installation alternative.

3.3.5.1 Affected Environment

MacDill AFB covers approximately 6,595 acres of land on a peninsula in Tampa, Florida. The proposed construction, demolition, and renovation would take place within the previously disturbed airfield and cantonment area of MacDill AFB, as shown in **Figure 2-1**.

Physiography and Topography. The geologic features of MacDill AFB are consistent with the generally flat, sandy terrain of the surrounding area and the Pamlico Terrace, which rises gently from the coast to approximately 25 feet above mean sea level (MSL). Elevations on the installation range from sea level at the southern edge to approximately 15 feet above MSL in the northern portions; much of the installation is less than 5 feet above MSL (MacDill AFB 2022b). The topography within the Project Area ranges between approximately 4 and 10 feet above MSL (USGS 2022a, 2022b).

Geology. MacDill AFB is situated in the Gulf Coastal Lowlands physiographic province and the Pamlico Terrace. Three principal lithologic sequences occur in the area. The surficial unit is unconsolidated sand, clay, and marl and may include remnants of the Hawthorn Formation composed of sand, clay, and thin lenses of limestone. Sands in this unit range from 5 to 20 feet thick, with clay layers up to 40 feet thick. This surficial layer is very thin to absent on the eastern side of the installation, and underlying limestone formations may outcrop in this area. Underlying the surficial layer are the Tampa and Suwannee limestones, which range from 250 to 500 feet thick. Below this layer is the Ocala Group, consisting of Avon Park, Lake City, and Oldsmar limestones, and the Cedar Keys Limestone, which is approximately 2,300 feet deep (MacDill AFB 2022b).

Geologic Hazards. Sinkholes are common in Hillsborough County but are uncommon on MacDill AFB because of overlying impervious layers of clay, limited groundwater recharge, and the presence of a slow discharge zone for the Floridan aquifer. Sinkhole activity at MacDill AFB is minimal, with only one sinkhole identified during a 1985 study (MacDill AFB 2022b). A considerable amount of fill material has also been placed on MacDill AFB to provide land for development.

MacDill AFB is at minimal risk from geologic hazards such as earthquakes because Florida lies on a passive continental margin with a stable transition between continental and oceanic crust. The 2014 National Seismic Hazard map shows that MacDill AFB has a seismic hazard rating of approximately 2 to 4 percent of the force of gravity (USGS 2014), making the risk of damage from seismic activity minimal.

Soils. The United States Department of Agriculture – Natural Resources Conservation Service (USDA NRCS) mapped eight soil series within MacDill AFB in the 1989 *Soil Survey of Hillsborough County, Florida*. These soil series include Arents, Malabar, Myakka, Pomello, St. Augustine, Tavaress, Urban Land, and Wabasso (USDA NRCS 1989). The Urban Land and the St. Augustine-Urban land complex are the only soil types within the Project Area (USDA NRCS 2022), although the St. Augustine-Urban land complex makes up less than 1 percent of the Project Area (see **Table 3-16**).

Table 3-16. Soils within the Alternative 1 Project Area at MacDill AFB

Mapping Unit	Slope	Characteristics[a]
Urban Land	0 to 2 percent slopes	85 percent or more of the surface is covered by impervious surfaces and artificially drained; not hydric
St. Augustine-Urban Land Complex	0 to 2 percent slopes	Consists of 50 percent St. Augustine, 40 percent Urban Land, 5 percent Kesson, and 5 percent Myakka; St. Augustine component comes from sandy mine spoil or earthly fill with a depth to restrictive layer greater than 60 inches, and is somewhat poorly drained with low shrink-swell potential; generally not hydric, although the minor components (Kesson and Myakka) are hydric soils

Sources: USDA NRCS 1989, 2022

[a] The USDA NRCS does not rate Urban Land for soil characteristics such as water capacity or erosion potential.

Soils are classified as Urban Land where existing development has altered or obscured the original soils beyond identification (USDA NRCS 1989). Most of the soils at the airfield and cantonment area on MacDill AFB are fill derived from dredging activities in surrounding areas that was used during installation construction to fill existing swamps and create stable construction surfaces (MacDill AFB 2021b). Surface cover in the Project Area is currently a combination of pavement, buildings, and landscaped lawn.

Erosion is an ongoing issue on portions of MacDill AFB, particularly on the eastern shoreline, which is outside the Project Area. The installation has been implementing shoreline stabilization efforts since 2003 to combat existing erosion and continued shoreline erosion associated with sea level rise under climate change (MacDill AFB 2022b).

Prime Farmland. The Project Area does not contain soils classified as prime or unique farmland, or farmland of statewide or local importance (USDA NRCS 2022).

3.3.5.2 Environmental Consequences

3.3.5.2.1 Analysis Methodology

Impacts on soils and geological resources were assessed to determine if Alternative 1would destroy unique geological features, cause substantial soil erosion, be in proximity to or have a substantial impact on geologic hazards (e.g., locating a proposed action in a seismic zone), substantially affect soil or geological structures that control groundwater quality or availability, or substantially alter soil structure or function.

3.3.5.2.2 Alternative 1

New construction and facility additions would create ground disturbance and changes in existing impervious surfaces, resulting in minor impacts on geology and soils. **Table 2-2** provides a summary of the ground disturbance and changes in impervious surfaces expected for Alternative 1.

Physiography and Topography. Long-term, negligible, adverse impacts would be expected on the natural topography in the Project Area due to site preparation (i.e., grading, excavating, and recontouring) and construction.

Geology. No impacts on geology would be anticipated from implementation of Alternative 1 because no geological resources would be disturbed.

Geologic Hazards. Short-term, negligible, adverse impacts on or from geologic hazards would be expected from an increased risk of sinkhole development during construction-related ground disturbance under Alternative 1. All new construction and facility expansions at MacDill AFB would be built on land with adequate fill and designed consistent with seismic safety regulations, reducing the potential to contribute to sinkholes and damage from sinkholes or earthquakes.

Soils. Short- and long-term, minor, adverse impacts on soils in the Project Area would be expected under Alternative 1 due to ground disturbance, an increase in impervious surfaces, and associated erosion and sedimentation.

Impervious surfaces would increase by approximately 9.4 acres, and approximately 16.6 acres of ground disturbance would occur. The primary impacts would include soil compaction, disturbance, and erosion. As described in **Section 3.3.5.1**, soil stabilization efforts for existing erosion issues continue at MacDill AFB. Additional erosion from construction, demolition, and renovation efforts could exacerbate this issue. In addition to ongoing erosion control methods, implementation of environmental protection measures and BMPs from project-specific and installation Erosion and Sedimentation Control Plans (ESCP) and Stormwater Pollution Prevention Plans (SWPPP) would be implemented to minimize adverse impacts on soils, including silt fencing, sediment traps, application of water to disturbed soils, and revegetation of disturbed areas with native plants.

Compaction of soils during construction activities would disturb and modify the soil structure. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline

in disturbed areas and be eliminated in those areas within the footprints of new buildings, pavements, and roadways. Loss of soil structure due to compaction from foot and vehicle traffic could change drainage patterns. Impacts would be minimized through implementation of soil decompaction methods such as aeration. Site-specific geotechnical soil testing would be conducted prior to or during construction as required to determine if limitations relating to contamination exist and to determine appropriate environmental protection measures to be implemented to minimize adverse impacts.

Prime Farmland. Because there is no prime farmland within the Project Area, no impacts on prime farmland would be expected under Alternative 1.

3.3.6 Water Resources

The ROI for analysis of effects on water resources under each alternative is the entire installation.

3.3.6.1 Affected Environment

Groundwater. MacDill AFB, in general, has three aquifer systems including (in descending order): a shallow, surficial aquifer system, an intermediate aquifer system/intermediate confining unit, and the Floridan Aquifer System (FAS) that underlies all of Florida (FDEP 2022). The surficial aquifer system is composed of sand, clayey sand, and shell; is approximately 20 feet thick; and is underlain by heterogeneous calcareous clays and limestone with varying permeability. This surficial aquifer is used for small irrigation systems off-installation and is not used by MacDill AFB. This shallow aquifer ranges from the surface to approximately 5 feet below ground surface (bgs) at inland locations and is highly susceptible to groundwater contamination, primarily due to shallow water table depth and highly permeable sediments with underlain limestone. MacDill AFB underground storage tanks (USTs), landfills, and golf courses (i.e., through fertilizer applications) are known sources of contamination for the surficial aquifer. Recharge of the surficial aquifer primarily occurs through precipitation percolation (MacDill AFB 2022b).

The FAS spans an area of approximately 100,000 square miles, ranges from 100 to 3,000 feet in thickness, and is underlain with continuous sequences of carbonate rocks (USGS 2021). The Floridan aquifer is not substantially recharged from the surface at MacDill AFB. The installation is primarily a discharge zone for the FAS because of an upward flow of groundwater in the vicinity. This aquifer has slight contamination but is not contaminated to the extent that remediation is required (MacDill AFB 2022b).

No potable water wells are on the installation; MacDill AFB obtains potable water from the City of Tampa (MacDill AFB 2022b). MacDill AFB operates a potable water storage and distribution system that provides water for various uses at all the facilities on the installation (see **Section 3.3.7** for a discussion on water infrastructure).

Surface Water. MacDill AFB is within the Tampa Bay (middle) watershed, spanning approximately 410 square miles in west-central Florida (USF 2022). The installation is surrounded by Hillsborough Bay to the northeast, Tampa Bay to the south, and Old Tampa Bay to the northwest. Raccoon Hammock and Broad Creek are the main natural drainage features

on MacDill AFB, and both are located on the southern portion of the installation. Surface water flows on the installation are primarily stormwater runoff. MacDill AFB is crisscrossed with drainage canals and a large area of mangrove swamps is located along the southern portion of the installation. Most of these canals are interconnected and influenced by tides. Ditches and pipes have also been installed to drain the developed portions of the installation. The drainage system is composed of approximately 24 miles of culverts and 56 miles of open ditches and canals. The drainage systems ultimately discharge into either Tampa Bay or Hillsborough Bay. Two large stormwater impoundments occur on base, Lake McClelland, and Lewis Lake (totaling approximately 20 acres), situated on the eastern side of the installation. Another 35 acres of small, unnamed impoundments occur throughout the installation, 14 of which are located on the north and south golf courses (MacDill AFB 2022b). The nearest designated WOTUS to MacDill AFB are the Hillsborough River (at the northern end of Hillsborough Bay, approximately 6 miles miles north of the installation); Archie Creek (approximately 5 miles northeast of the installation across Hillsborough Bay near 78th Street); and the Alafia River, approximately 4.5 miles east of the installation across Hillsborough Bay near the East Bay Raceway Park) (USGS 2023).

Measures are in place at MacDill AFB to improve surface water health, as well as stormwater water runoff quality. A project currently diverts stormwater from major drainage canals through a series of ponds, increasing contact time with vegetation and decreasing flow rate. This project is part of the Surface Water Improvement and Management program, which has aided in restoring wetland habitats and creating new wetlands in southwestern Florida. In conjunction with the Surface Water Improvement and Management project, MacDill AFB also continues to remove invasive vegetation in the stormwater conveyances, treatment ponds, and other surface water bodies on installation with support from the 6th Civil Engineer Squadron, USFWS, and base Habitat Restoration contractor to improve water quality (MacDill AFB 2013a, MacDill AFB 2020b).

Florida Administrative Code 62-302.40 classifies all surface waters according to their designated use. Tampa Bay is a Class III water, with portions of the bay south and southwest of MacDill AFB classified as Class II waters. Class III is designated for fish consumption; recreation; propagation; and maintenance of a healthy, well-balanced population of fish and wildlife. Class II is designated for the same uses as Class III and includes shellfish propagation or harvesting. The Lower Hillsborough Bay, in the Tampa Bay watershed, is listed as impaired due to the presence of mercury in fish tissue and elevated chlorophyll a (USEPA 2022a).

MacDill AFB has two National Pollutant Discharge Elimination System (NPDES) permits: a Multi-Sector Generic Permit (MSGP) for stormwater discharge associated with industrial activity (Permit No. FLR05E128), and a Phase II municipal separate storm sewer system (MS4) general stormwater permit (Permit No. FLR04E059). The MSGP primarily covers flightline areas, such as runway and airfield aprons at MacDill AFB, including activities such as aircraft refueling, vehicle maintenance, and materials handling. As a component of the MSGP, MacDill AFB maintains and follows a SWPPP that documents existing stormwater management practices and guides personnel who are responsible for ensuring that potential stormwater pollution is minimized. MacDill AFB also maintains multiple documents, such as Spill Prevention, Control, and Countermeasure (SPCC) Plans and an Integrated Contingency Plan, that provide guidance for handling hazardous materials appropriately and detailed procedures to follow in the event of

a spill (see **Section 3.3.9**). The proposed Squad Ops parking lot coincides with a small drainage ditch that has intermittent flows primarily during storm events. No other surface water features coincide with the Project Area, though several surface water features are within this portion of the installation (see **Figure 3-7**).

Floodplains. Approximately 93 percent of MacDill AFB is within the 100-year floodplain, which is included in the 500-year floodplain. According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map Numbers 12057C0476J,12057C0457J and 12057C0478J, all effective October 2021, all areas of Alternative 1 are within the 100-year floodplain, Flood Zone AE (FEMA 2022) (see **Figure 3-7**). In this zone, properties have a greater than 1 percent chance of experiencing flooding in any given year. The installation constructs and manages facilities in this area to be consistent with the intent of the floodplain management guidelines promulgated under the with the National Flood Insurance Program. A small portion of the runway and North Boundary Boulevard on MacDill AFB are outside the coastal floodplain. No areas of Alternative 1 would be located within the Coastal High Hazard Area (or Special Flood Hazard Area) that would be subjected to storm hazards due to wind and wave action.

3.3.6.2 Environmental Consequences

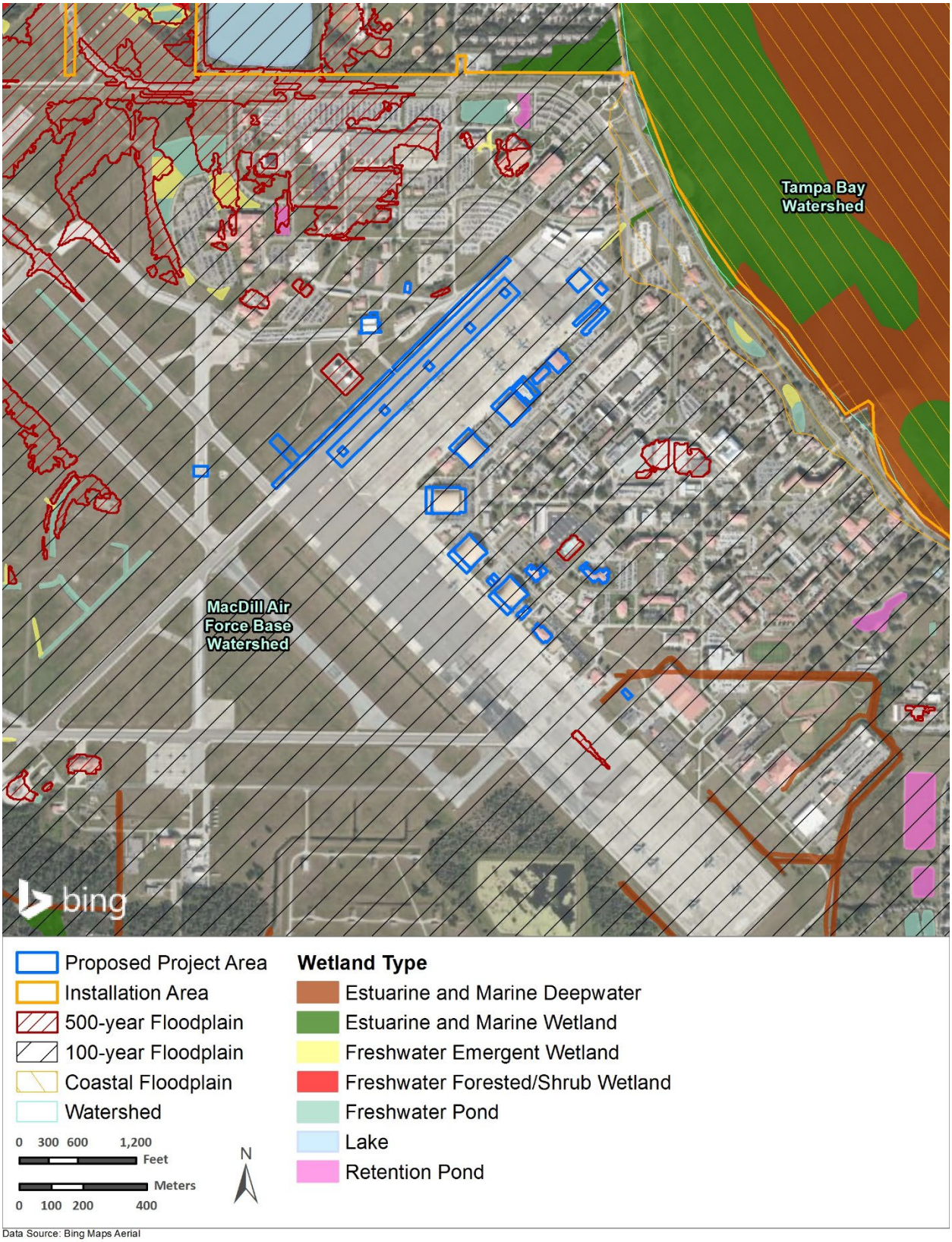
3.3.6.2.1 Analysis Methodology

Impacts on water resources were assessed to determine if Alternative 1 would substantially affect water quality, reduce water availability, or reduce supply to existing users; endanger public health or safety by creating or worsening health or flood hazard conditions; threaten or damage unique hydrologic characteristics; overdraft groundwater basins; exceed the safe annual yield of water supply sources; or violate applicable laws or regulations that protect water resources.

3.3.6.2.2 Alternative 1

Groundwater. Short-term, negligible to minor, adverse impacts on the surficial aquifer at MacDill AFB could occur due to potential intersection between construction, demolition, and renovation and the surficial aquifer as well as impacts on groundwater recharge from an increase in impervious surfaces. The surficial aquifer at MacDill AFB ranges from the surface to 5 feet bgs at inland locations. Shallow depth and high permeability would cause this shallow aquifer to be vulnerable to activities associated with excavation, demolition, and construction that may intersect the local groundwater table in areas where the surficial aquifer is at and/or just under surface levels. Incidental contaminant discharges (e.g., fuel, lubricants) from construction equipment may potentially reach the surficial aquifer in this area.

Potential PFAS contamination and petroleum products at MacDill AFB in the Project Area could also leach into the groundwater during ground disturbance or daily operations under Alternative 1. Any groundwater that is dewatered during construction or operation would need to be containerized, sampled, and disposed of appropriately off-site. In addition, there are no surface water to groundwater or groundwater pathways that can reach off-installation drinking water wells. Groundwater flow is to the west, south, and southeast into Hillsborough Bay and off-installation drinking water wells are located upgradient from the groundwater flow pathway to the north-northwest of MacDill AFB (MacDill AFB 2021c). See **Section 3.3.9** for more information about PFAS contamination and petroleum products at MacDill AFB.



Data Source: Bing Maps Aerial

Figure 3-7. Water Resources at MacDill AFB

The large, most prominent Floridan aquifer in the area ranges from 300 to 1,000 feet bgs. The Floridan aquifer would not be affected under Alternative 1.

Groundwater recharge to the surficial aquifer system could be impacted by an approximately 9.4-acre increase in impervious surfaces and associated increased stormwater runoff to nearby waterbodies, thereby decreasing infiltration in soils. A decrease in infiltration and increase in flow rate could intensify erosion and sedimentation from impervious surface runoff. Specific BMPs to decrease sedimentation and soil erosion in runoff could include stabilized construction entrances, silt fencing, berms and swales, check dams, vegetated channels, basins and traps, outlet protection, erosion control blankets, and level spreaders. Most of the proposed development activities would occur in previously disturbed and developed areas at MacDill AFB. The impacts from increased surface water runoff would be reduced by the regulations outlined in Section 438 of the Energy Independence and Security Act (EISA; 42 United States Code Part 17094). Section 438 of the EISA requires stormwater design for federal construction projects that disturb more than 5,000 square feet. Use of stormwater management practices outlined in Section 438 of the EISA, such as revegetation and use of porous pavements, cisterns, and green roofs, would decrease the severity of impact that stormwater runoff would have on this aquifer.

Surface Water. Alternative 1 would result in short-term, minor, adverse impacts on surface water at MacDill AFB due to increased erosion and sedimentation associated with construction, demolition, and renovation. Erosion could occur and associated sedimentation could flow into surface water features during construction. Construction, demolition, and renovation activities resulting in ground disturbance (approximately 16.6 acres) would be conducted in accordance with the applicable stormwater discharge permit to control erosion and prevent sediment, debris, or other pollutants from entering the stormwater system. Construction activities such as clearing, grading, trenching, and excavating would displace soils. MacDill AFB is required to obtain coverage under the NPDES General Permit for all construction activities more than 1 acre to minimize impacts from sedimentation on water quality. If not managed properly, disturbed soils would be washed as sediments into nearby waterbodies during stormwater events and reduce water quality. Erosion and sediment controls and stormwater management practices would be implemented to minimize the potential for adverse impacts associated with stormwater runoff, erosion, and sedimentation.

Short-term, minor, adverse impacts from construction, demolition, and renovation activities associated with Alternative 1 could temporarily decrease water quality. Construction, demolition, and renovation associated with Alternative 1 would result in increased short-term stormwater runoff into nearby water bodies on the installation, and an increase in impervious surfaces needed to support the new facilities would result in increased long-term runoff. The proposed KC-46A hardstands, expanded Alpha Ramp, and building additions would result in a net increase of approximately 9.4 acres of impervious surfaces. The amount of new construction would be minimized by reusing facilities with modifications or additions, thereby minimizing the increase in impervious surfaces. Most of the proposed development would occur in areas already developed and/or the previously disturbed cantonment area of MacDill AFB. EISA requirements would be followed to maintain or restore, to the maximum extent practical, the predevelopment hydrology of the property with regard to rate, volume, and flow duration.

Stormwater discharge from MacDill AFB would not likely cause significant change in the quality of Hillsborough Bay; it is already listed as impaired due to the presence of mercury in fish tissue and elevated chlorophyll a level. Adverse impacts on water quality in Tampa Bay may occur due to stormwater discharge and runoff at MacDill AFB. Tampa Bay is classified as Class III waters, which are designated for fish consumption; recreation; and maintaining a healthy, well-balanced population of fish and wildlife. Measures implemented in accordance with the installation and project-specific SWPPPs and ESCPs would avoid or minimize the potential adverse effects related to stormwater runoff and sedimentation, including into Tampa Bay. Due to the distance between MacDill AFB and the closest WOTUS, no impacts on WOTUS are anticipated.

Floodplains. Alternative 1 would result in long-term, minor, adverse impacts on the surrounding floodplain from an increase in runoff and an increased erosion rate. Early public notice was issued at scoping per EO 11988.

The majority of MacDill AFB is within the 100-year and 500-year coastal floodplain, meaning all runoff and discharge occurs within a floodplain. BMPs, in conjunction with the SWPPP for MacDill AFB and the project, would be used to reduce stormwater runoff where possible. Examples of these BMPs would include using low-impact development where applicable and adhering to the project-specific and installation SWPPPs and ESCPs. A potential option to reduce flood impacts would be to elevate ground floors of newly constructed facilities above the floodplain level. Construction would not affect the flow of water in a flood event to impact the floodplain.

To minimize impacts on floodplains or from flooding, new facilities would be constructed in conformance with EO 14008; DoD's UFC-2-100-01 and UFC 3-201-01; DoD's Directive-type Memorandum 22-003, *Flood Hazard Area Management for DoD Installations*; and DoD's 2021 *Climate Adaptation Plan*.

MacDill has moved new development away from the shoreline creating flood buffer areas, elevated foundations, and relocated key infrastructure to prevent and reduce losses; guided structural retrofits to make existing structures more resilient to flooding; and constructed living shorelines and rock barriers at the shore to reduce wave energy for storm surge. Additionally, construction of new facilities would incorporate the following requirements per the FEMA Federal Flood Risk Management Standard and UFC 3-201-01:

- Mission critical facilities must be constructed 3 feet above the base flood elevation, and non-mission critical facilities must be elevated 2 feet above the base flood elevation.
- For facility renovations that exceed 50 percent of the facility replacement cost, flood mitigation measures would include locating critical infrastructure (e.g., electrical and heating, ventilation, and air conditioning [HVAC] systems) above the flood elevation whenever practical. Preliminary estimates indicate the cost for renovation of the hangars would not likely exceed 50 percent of the facility replacement costs.
- Flood avoidance would be implemented to the extent practicable in the hangar modification design and construction. Per the International Existing Building Code, Chapter 5 Section 507.3, Exemption 1 (International Code Council 2021) however, the proposed renovations of the NRHP-eligible hangars themselves would be exempt from floodplain compliance requirements that would relocate or reconstruct the facilities to

increase the underlying elevations because such actions would compromise the historic nature and integrity of the resources (International Code Council 2021). Details on the historic status of the hangars are provided in **Section 3.3.3.2.2**.

New construction, facility addition and renovation, and infrastructure construction and repair projects under Alternative 1 would be subject to the following Southwest Florida Water Management District (SWFWMD) permit requirements to avoid or minimize flood impacts:

- Construction projects that create more than 4,000 square feet of impervious and semi-impervious surfaces for new facility construction or addition, or 9,000 square feet of impervious and semi-impervious surface for vehicle traffic, would require application for an Environmental Resource Permit through the SWFWMD. Both new construction projects and the majority of the airfield and infrastructure improvements (see **Table 2-1**) to be completed under Alternative 1 would exceed these thresholds of additional impervious or semi-impervious surfaces and would require Environmental Resource Permits.
- Design measures for construction of new facilities would include the construction of appropriately sized stormwater management features, such as drainage swales and detention basins, to compensate for the increase in impervious surface.
- When expanding an existing facility with an addition, it is impractical to elevate the addition above the floodplain; however, facility additions that create more than 4,000 square feet of new impervious and semi-impervious surface area would require construction of stormwater mitigation measures such as drainage swales or stormwater detention basins. Both new construction projects and the majority of the airfield and infrastructure improvements (see **Table 2-1**) to be completed under Alternative 1 would exceed this threshold of additional impervious or semi-impervious surfaces and would require construction of stormwater mitigation measures.
- The construction of facility infrastructure projects, such as roadways and parking lots, would also include design measures to mitigate flooding impacts. Per SWFWMD regulations, infrastructure projects that create an increase in impervious and semi-impervious surface of more than 9,000 square feet would require construction of stormwater management features such as drainage swales and/or detention basins.
- All drainage swales or stormwater detention basins would be designed to provide for water quality and quantity treatment sufficient to withstand a 25-year, 24-hour storm event.

In addition to project-specific avoidance, minimization, and mitigation measures, MacDill AFB implements installation-wide projects to combat impacts from climate change and severe weather and prevent further exacerbation of climate change impacts. These projects are described in **Table 2-11**.

3.3.7 Infrastructure and Transportation

The ROI for the analysis of impacts on infrastructure and transportation under each alternative includes utility services and supplies on the installation and in the surrounding communities, Project Area and installation roadways, access gates, and the regional road/highways immediately proximal to the installation.

3.3.7.1 Affected Environment

Potable Water. The potable water distribution system at MacDill AFB is owned and operated by the Florida Government Utility Authority (FGUA), which obtains water from the City of Tampa, which in turn sources potable water from Tampa Bay Water's Aquifer Storage and Recovery system, groundwater, surface water, and desalinated seawater supplies. Water quality is very good, and the installation operates three chlorine booster stations that can treat domestic water when needed. Three potable water tie-ins receive water at the installation boundary. Two ground (at-grade level) storage tanks (one inside the other) and two water towers are used for potable water storage on the installation. The ground storage tanks, within the northern portion of the installation, just east of Building 926, each hold approximately 400,000 gallons; the north tower, in the main cantonment area, holds 500,000 gallons; and the south tower, in the accompanied housing area, holds 250,000 gallons. The total potable water storage capacity on the installation is 1.59 million gallons (MacDill AFB 2019d).

The water distribution system, which includes potable water and fire protection, consists of 227,000 linear feet of piping, some of which is 50 to 60 years old. It is a mixture of steel, cast iron, polyvinyl chloride, and high-density polyethylene pipe. The installation has been implementing improvement projects to include the replacement of the original cast iron pipes. Additional improvement projects are underway, with more planned in the future. Despite being improved in recent years, the water distribution system is still considered degraded (MacDill AFB 2019d).

The capacity of the water distribution system at MacDill AFB is 3.6 million gallons per day (mgd). Average demand on the installation is 1.05 mgd and peak demand is 3.31 mgd. During average and peak demand requirements, the installation has adequate water supply. Water lines occur within 500 feet of all facility and infrastructure project locations (MacDill AFB 2019d).

Electrical System. Electrical power at MacDill AFB is provided by Tampa Electric Company (TECO) via two substations. The total capacity of the electrical system is 70.4 megawatts, while the electrical demand is 26 megawatts. Emergency electrical generation for mission critical functions is provided by backup generators. The installation is continually implementing energy conservation projects to meet the federal requirement for reduced energy consumption (MacDill AFB 2019d).

Electricity is distributed via underground and overhead lines throughout the installation. The administrative, flightline, and housing areas are served by primary and secondary underground lines, while the southern airfield and POL farm areas receive electricity via overhead lines. The electrical distribution system has been updated and is in excellent condition. Electric distribution lines occur within 500 feet of all facility and infrastructure project locations (MacDill AFB 2019d).

Natural Gas System. Natural gas at MacDill AFB is provided by TECO-Peoples Gas, and the installation's natural gas distribution system is owned and operated by the DAF. The natural gas distribution system primarily provides natural gas to the main cantonment and housing areas, with more than 43,000 linear feet of piping throughout the installation and an additional 16,523 linear feet in the housing areas. The natural gas distribution system is in good condition, with a capacity of 15.74 million cubic feet per month and a monthly demand of 2.884 million

cubic feet. Due to the mild temperatures at MacDill AFB, natural gas demand is low. All facility and infrastructure project locations are within 1,000 feet of natural gas infrastructure, except for the DASH-21 Facility and Bird Bath, which are within 2,000 feet of the nearest natural gas line (MacDill AFB 2019d).

Liquid Fuel Supply. MacDill AFB receives, stores, and delivers jet fuel by pipeline and commercial tanker truck, although pipeline delivery accounts for 98 percent of jet fuel delivery on the installation. The Defense Fuel Supply Point consists of three aboveground storage tanks (ASTs), originally constructed in 1952 on the western side of the installation, with a combined total capacity of 6.93 million gallons. Fuels are distributed via an aboveground and belowground pipeline from the Defense Fuel Supply Point directly to the north apron of the airfield. The Defense Fuel Supply Point ASTs were refurbished in 1985 and are in good condition (MacDill AFB 2019d).

The POL system distributes jet fuel from the Defense Fuel Supply Point and consists of a Type III pressurized hydrant system and two additional ASTs with a combined total capacity of 2.4 million gallons. The hydrant system services 12 hydrant pits within the north apron, which are used to distribute fuel directly to the aircraft. Three additional hydrant pits are planned, aside from the MOB 6 beddown. Overall, the installation is operating at 48 percent capacity of the POL fuel storage and Type III hydrant system. The two POL system ASTs were constructed in 2004 and are in excellent condition. The Type III hydrant system is in good condition (MacDill AFB 2019d).

Sanitary Sewer and Wastewater. The water discharge and sewer collection systems at MacDill AFB are owned and operated by FGUA, and consist of sewer lines, lift stations, and a wastewater treatment plant (WWTP). The WWTP, located in the southeastern corner of the installation on Bayshore Drive, has a capacity of approximately 2 mgd and is permitted to treat up to 1.2 mgd, which is sufficient to handle the average demand of 422,750 gallons per day (gpd). During periods of heavy rainfall, the peak demand of the wastewater system is 1.09 mgd. Effluent from the WWTP is pumped into a holding pond with a capacity of 4 million gallons. From the holding pond, the treated water is pumped to and irrigates two golf courses at the Bay Palms Golf Complex to the north and south of the WWTP. During wet periods, surplus effluent can be pumped to a 10-acre restricted access spray field or a 20-million-gallon wet weather storage pond near the intersection of South Shore Avenue and Marina Bay Drive, just west of the golf complex. The wastewater discharge and sewer collection systems consist of more than 62,000 linear feet of piping, 60 lift stations, and the WWTP, and are in good condition. Approximately 12,000 linear feet of piping and 60 maintenance holes have been recently replaced with additional improvements planned for the future. Sanitary sewer lines occur within 1,000 feet of all facility and infrastructure project locations, except for the DASH-21 Facility and Bird Bath, which are within 2,000 feet of the nearest sanitary sewer line (MacDill AFB 2019d).

Stormwater System. The stormwater drainage system at MacDill AFB consists of drainage ditches, culverts, gravity lines, storage ponds, and other infrastructure that connect to tidal creeks and canals or directly into Tampa or Hillsborough Bays. The system includes 24.6 miles of culverts and 56.3 miles of open ditches and canals, with five drainage basins. Areas of the installation that are not served by stormwater infrastructure either drain over land into nearby

water bodies or infiltrate into the soil. Stormwater infrastructure is present near the Project Area. Generally, stormwater that falls on and near the airfield is collected through gravity lines, open ditches, and canals, and is discharged through two main outfalls to the south into Tampa Bay (MacDill AFB 2020c). The stormwater discharge and collection system has been updated over the years; however, some areas remain outdated. Stormwater management is a major consideration and design element for all new development at MacDill AFB, and the overall system improves as new development occurs and additional stormwater management improvements are made (MacDill AFB 2019e).

The stormwater drainage system on the installation is permitted as a Florida Department of Environmental Protection (FDEP) Phase II MS4. The MS4 receives nonindustrial and industrial stormwater runoff. NPDES regulations require the installation to obtain authorization from FDEP for discharges of stormwater to any surface water (ditches, canals, ponds) and WOTUS (Hillsborough and Tampa Bays). MacDill AFB has two NPDES permits, including a Multi-Sector General Permit for stormwater discharge associated with industrial activities and a general permit for stormwater discharges from Phase II MS4 (MacDill AFB 2020c). Details about the installation's stormwater permits are provided in **Section 3.3.6**. Additionally, projects that disturb more than 1 acre (or that contribute stormwater discharges to surface waters of the State of Florida or a MS4) must apply for a NPDES General Permit for Stormwater Discharge from Large and Small Construction Activities.

Solid Waste Management. Municipal solid waste at MacDill AFB is managed via an Integrated Solid Waste Management Plan (ISWMP), in accordance with AFMAN 32-7002, *Environmental Compliance*. As part of the ISWMP, the installation maintains a recycling program to manage recyclable materials. Under the recycling program, the installation collects cardboard, glass, scrap metal, aluminum cans, steel cans, plastic bottles, newspapers, office paper, universal waste, waste jet fuel, used oil, and used oil filters. Sea Coast Disposal is responsible for collection, transportation, and disposal of solid waste and recyclable materials. Defense Logistics Agency Disposition Services accepts materials for reutilization, transfer, donation, or sale. At MacDill AFB, they process recyclable materials, including scrap metals, electronics, automotive tires, and aircraft tires (MacDill AFB 2021c).

The installation generates approximately 5,500 tons of nonhazardous solid waste annually, including construction and demolition debris. Approximately 44 percent of the nonhazardous waste and 59 percent of the construction and demolition waste are diverted on average (MacDill AFB 2019d). Solid waste generated at the installation that is not diverted is typically disposed at the McKay Bay Refuse-to-Energy Facility located off-installation in Tampa (MacDill AFB 2021d). This facility receives an average of more than 330,000 tons of waste annually, which is burned at high temperatures to generate energy. The remaining ash is disposed at nearby landfills. The McKay Bay Refuse-to-Energy Facility has a design capacity of 1,000 tons per day, although the operational capacity is 904 tons per day. Management of construction and demolition waste generated from contractor-performed construction, renovation, and maintenance projects on the installation is the responsibility of the contractor. Contractors are required to comply with federal, state, local, and DAF regulations for the collection and disposal of municipal solid waste.

Communications System. Communications infrastructure at MacDill AFB consists of copper cable (15 percent), fiber optic cable (85 percent), and maintenance hole/conduit systems that provide support for telephones, fire, and crash systems; security alarm systems; radio systems; energy monitoring and control systems; and point-to-point data systems across the installation. The communications system includes one core router and seven support routers that serve 250 buildings on the installation. The system is robust, with only 12 percent of the system being used. The communications infrastructure is in good condition and upgraded every 5 years (MacDill AFB 2019d).

Airfield. The MacDill AFB airfield pavements system includes the runway, paved overruns, parking and maintenance aprons, aircraft taxiways, and an arm/disarm pad. The installation includes a single runway, Runway 05/23, that runs northeast to southwest, parallel to Taxiway G. The main aircraft parking apron is connected by Taxiway K, which runs east and west; and Taxiway L, which runs northeast to southwest and intersects Taxiway K. Taxiway N originates at the same location as Taxiway L but runs northwest, becomes Taxiway F, and connects to Runway 05/23. An additional parking apron occurs along Taxiway I (MacDill AFB 2013b).

Transportation. Transportation infrastructure within and surrounding MacDill AFB includes the regional network of roads and highways as well as access gates and on-installation roads.

Regional Transportation. The Dale Mabry Highway is the main north-south corridor, with access to MacDill AFB and a main throughfare for the Tampa Bay area. The highway extends from the Dale Mabry Gate, connects installation-related traffic to other major roadways, including U.S. Interstate 275 and Interstate 4, and merges with U.S. Highway 41 at its northern terminus. Three other north-south corridors, aside from Dale Mabry Highway, connect MacDill AFB to the greater Tampa area. These include, from east to west: Bayshore Boulevard, MacDill Avenue, and West Shore Boulevard.

The Hillsborough Area Regional Transit Authority provides the Tampa area with public transportation that includes a bus system, a bus-rapid transit system for longer trips, streetcar lines, and door-to-door paratransit service. The transit service provides local and express bus service to the installation (HART 2021). No rail facilities are present in or near the Project Area.

Gate Access. MacDill AFB is accessed from three general access gates and one commercial vehicle inspection gate. The main gate, known as the Dale Mabry Gate, is in the north-central portion of the installation and is fed by Dale Mabry Highway. The Dale Mabry Gate operates 24 hours per day and processes approximately 6,800 vehicles daily, accounting for 57 percent of all vehicles accessing the installation. The two other general access gates include the MacDill Gate, along South MacDill Boulevard approximately 0.75 mile east of the Dale Mabry Gate; and the Bayshore Gate, along Bayshore Boulevard at the northeastern boundary of the installation, approximately 1 mile east of the Dale Mabry Gate. The MacDill Gate is open to outbound traffic only from 3:00 p.m. to 5:00 p.m. on weekdays. The Bayshore Gate generally operates from 5:30 a.m. to 8:00 p.m. Monday through Thursday and from 5:30 a.m. to 5:00 p.m. Friday through Sunday, and processes approximately 35 percent (4,200 vehicles) of all vehicles accessing the installation (MacDill AFB 2019d, 2021e).

The commercial vehicle processing gate (i.e., Tanker Way Gate), at the northwestern boundary of the installation along North Boundary Boulevard and approximately 0.6 mile west of the Dale Mabry Gate, operates weekdays from 6:00 a.m. to 8:00 a.m. for all traffic and from 8:00 a.m. to 2:00 p.m. for commercial vehicles only. The Tanker Way Gate processes approximately 1,000 vehicles per day. The incoming vehicle processing capacity of each gate is summarized in **Table 3-17**. All four gates were reported as operating at or near their capacity (MacDill AFB 2019d, 2021e).

Table 3-17. 2019 Incoming Vehicle Processing Capacity at MacDill AFB Gates

Gate	Daily Capacity (number of vehicles)	Average Demand (number of vehicles)	Headroom[b] (number of vehicles)
Dale Mabry Gate	6,800	6,800	0
Bayshore Gate	4,200	4,200	0
MacDill Gate[a]	N/A	N/A	N/A
Tanker Way Gate	1,100	1,000	100
Total	**12,100**	**12,000**	**100**

Source: MacDill AFB 2019d, 2021e
Note: Values are approximate.
[a] The MacDill Gate is not open to incoming traffic.
[b] Headroom is the capacity available for additional vehicles to access each gate.
Key: N/A = Not Applicable

In 2020, additional traffic data was collected and reported by the Florida Department of Transportation (FDOT) via the Florida Traffic Online website (FDOT 2021a). The traffic count data from 2020 reflect the most current available for the installation. **Table 3-18** summarizes traffic count data for key roadways at MacDill AFB gates or roadways that queue into the installation gates. The data indicate the Dale Mabry Gate is the busiest gate at the installation.

Table 3-18. 2020 Traffic Counts for MacDill AFB Access Gates

Gate	Traffic Count Location	2-way Annual Average Daily Traffic
Dale Mabry Gate	Dale Mabry Highway from Dale Mabry Gate to Interbay Boulevard	20,200
	Dale Mabry Highway Traffic Circle south of Dale Mabry Gate	10,500
Bayshore Gate	Bayshore Boulevard from MacDill AFB to Interbay Boulevard	6,600
MacDill Gate	MacDill Avenue from MacDill AFB to West Kennedy Boulevard	4,000
Tanker Way Gate	Interbay Boulevard from South Hoadley Street to Gandy Boulevard	5,700

Source: FDOT 2021a

On-Installation Transportation. The on-installation transportation system consists of primary, secondary, and tertiary roadways that connect with the off-installation road network through the four access gates. Primary roads include South Boundary Boulevard, Hangar Loop Drive,

Florida Keys Avenue, Golf Course Avenue, Marina Bay Drive, Hillsborough Loop Drive, and North Boundary Boulevard. Secondary roads include Zemke Avenue, Tampa Point Boulevard, and Fortress Drive. Approximately 8 million square feet of roadway surfaces occur throughout MacDill AFB. The installation has implemented traffic control measures at most of the signaled intersections, which has alleviated most traffic congestion problems throughout the installation. MacDill AFB employs a total of 19,475 personnel, many of whom transit to and from the installation daily. Hangar Loop Drive is the primary roadway, with access to parking areas near the facility and infrastructure project locations. Parking in these areas is available in surface lots. Parking availability within the area is considered adequate, with additional spaces planned for future construction. Additionally, MacDill AFB has a robust pedestrian network, with sidewalks at every roadside throughout most of the installation and crosswalks provided at convenient crossing locations (MacDill AFB 2019d).

The Hillsborough Area Regional Transit Authority provides limited express route bus services on MacDill AFB within the cantonment area (HART 2021).

3.3.7.2 Environmental Consequences

3.3.7.2.1 Analysis Methodology

The analysis to determine potential significant impacts on infrastructure from Alternative 1 considers primarily whether capacity would be exceeded or an unreasonable demand would be placed on a specific utility. Impacts might arise from energy needs created by either direct or indirect workforce and population changes related to installation activities. The impacts analysis assumes that all construction contractors would be informed of utility locations prior to any ground-disturbing activities that would result in unintended utility disruptions or human safety hazards, all construction activity would be conducted in accordance with federal and state safety guidelines, and any permits required for excavation and trenching would be obtained prior to the commencement of construction activities.

Impacts on transportation systems from Alternative 1 would be considered significant if they resulted in substantial decline in the operability of a roadway, excessive delays at installation gates, reduced traffic safety leading to increased risk of vehicular accidents, significant degradation of the existing transportation infrastructure, or substantial and permanent changes to roadway accessibility.

3.3.7.2.2 Alternative 1

Potable Water. Short- and long-term, negligible, adverse impacts on the potable water system at MacDill AFB would be expected from interruptions to water supply and the distribution system during construction, demolition, and renovation associated with Alternative 1 as well as an increase in demand from additional personnel. Short-term water supply and distribution system interruptions could be experienced when new facilities, such as the DASH-21 Facility and High Bay Supply/Bulk Storage Warehouse, are connected to the water supply system, or when facilities need to be disconnected and connected to the installation's water supply system during renovation activities, such as for the Air Transportable Galley/Lavatory (ATGL) Storage Building and the Washrack and Bird Bath renovations. Any potential disruptions would be temporary and coordinated with area users prior to disconnection or reconnection to the system. Water

necessary for construction would be obtained from the existing water supply and would have a negligible effect on the installation's overall water supply capacity.

Long-term, negligible, adverse impacts on the potable water supply system at MacDill AFB would occur from the personnel increase associated with Alternative 1. The United States Geological Survey (USGS) estimates Hillsborough County residents used 161 gallons of potable water per day in 2015 (USGS 2018a). This includes potable water use for domestic, industrial, commercial, and public (such as firefighting) purposes. Using 161 gallons of potable water per day per person as a conservative planning factor to estimate the potential increase in total potable water usage, the additional 283 installation personnel and dependents under Alternative 1 would consume a total of approximately 45,563 gallons of potable water per day. As a result, the average daily water demand at MacDill AFB would increase from approximately 1.05 mgd to approximately 1.10 mgd, an increase of approximately 4 percent. The new total daily water demand would represent approximately 30 percent of the system capacity of 3.6 mgd. The increased water demand also would not exceed the supply capacity during periods of peak demand. Because the planning factor for potable water consumption represents a conservative estimate, actual potable water consumption from the additional personnel and dependents may be less than what was estimated.

Electrical System. Short- and long-term, negligible to minor, adverse impacts on the electrical system at MacDill AFB would be expected from electrical disruptions during construction, demolition, and renovation associated with Alternative 1 as well as increased demand from additional personnel. Short-term electrical disruptions could occur while buildings are connected to or disconnected from the MacDill AFB electrical distribution system during construction, demolition, and renovation activities required for the facility and infrastructure projects. Any electrical disruptions would be temporary and coordinated with area users prior to the disruption. Electrical utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, minor, adverse impacts on the electrical supply would be expected following the completion of the facility and infrastructure projects due to increased demand. Slight increases in the electrical power usage at MacDill AFB would occur from the influx of personnel onto the installation and into the surrounding communities, and from electricity requirements at new buildings. New facilities, such as the DASH-21 Facility and High Bay/Supply Bulk Warehouse, would result in a net increase of 25,454 square feet and would require electricity, which would increase the overall energy usage at MacDill AFB. All construction and renovation projects would attain at least the Leadership in Energy and Environmental Design silver certificate, which would result in energy efficiency and reduced electricity demand compared to older buildings, and potentially influence the source of electricity through the use of alternative energy sources. According to the U.S. Energy Information Administration, the average monthly residential consumption of electricity for customers in Florida was 1,142 kilowatt hours (1.142 megawatt hours) in 2020 (USEIA 2021). This information was used to calculate a yearly energy usage of approximately 13.7 megawatt hours per resident. Using that number as a residential planning factor, with the assumption that each additional personnel would reside in their own household, the additional 283 personnel and dependents, or approximately 234 households, would increase the region's annual electricity demand by approximately 3,206 megawatt hours. Assuming the

234 households use electricity at the 2020 rate, Alternative 1 would increase the daily electricity demand by approximately 8.8 megawatt hours per day (less than 0.4 megawatts). Therefore, the average electricity demand at MacDill AFB would increase from approximately 26 to 26.4 megawatts, and the new total electricity demand would represent approximately 37 percent of the system capacity of 70.1 megawatts. New facilities would not require emergency backup generators; therefore, the installation's capacity to provide backup power would not be affected.

Natural Gas System. Short- and long-term, negligible, adverse impacts on the natural gas system at MacDill AFB may occur from temporary service disruptions during construction, demolition, and renovation, and increased consumption during daily operations. Temporary interruptions in natural gas supply could occur when buildings are disconnected from or connected to the natural gas distribution system during construction and renovation activities. Disruptions would be temporary and coordinated with area users beforehand. Natural gas utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, negligible, adverse impacts would occur from the operation of natural gas heating systems for the newly constructed facilities, such as the BASH-21 Facility and High Bay/Supply Bulk Warehouse. It was conservatively estimated the new buildings would be 0.5 million cubic feet in total. The natural gas distribution system at MacDill AFB has a capacity of 15.74 million cubic feet per month and a monthly demand of 2.884 million cubic feet; therefore, it is not anticipated the new buildings would require a natural gas supply beyond the natural gas distribution capacity.

Liquid Fuel Supply. Short-term, negligible, adverse impacts on the liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required during construction and renovation activities under Alternative 1. Petroleum would be brought on site by contractors, and remnant amounts would be removed when construction and renovation activities are complete.

Long-term, negligible, adverse impacts on the liquid fuel system at MacDill AFB would be expected from increased aircraft operations associated with Alternative 1. Total aircraft operations would increase by approximately 15 percent, resulting in an increased demand for jet fuels. Adverse impacts would be minimized through improvement of existing and added fuel distribution infrastructure as part of the facility and airfield improvement projects, which would increase the capacity for fuel delivery to aircraft and improve the reliability of the fuel distribution system.

Sanitary Sewer and Wastewater. Short- and long-term, negligible, adverse impacts on the wastewater system at MacDill AFB could occur while buildings are disconnected from or connected to the wastewater system during construction, demolition, and renovation activities as well as from increased demand from the additional personnel. Disruptions would be temporary and coordinated with area users prior to construction or renovation activities. Wastewater utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, negligible, adverse impacts on the sanitary sewer system at MacDill AFB would be expected from personnel increases associated with Alternative 1. Based on a typical individual wastewater generation rate of 50 gpd per person on an 8-hour shift at an industrial facility, the increase of 234 personnel would result in an increase of 11,700 gallons of wastewater per day (DAF 2016). If the 234 additional personnel and their dependents reside on MacDill AFB, an additional approximately 9,525 gallons of wastewater would be generated. The average demand of the WWTP at MacDill AFB is 422,750 gpd, while the WWTP capacity is permitted to treat up to 1.2 mgd. The additional personnel would increase the wastewater demand to 443,975 gpd, which would be under the permitted limit of the WWTP.

Stormwater System. Short- and long-term, negligible to minor, adverse impacts on the MacDill AFB stormwater system would be expected due to construction-related temporary disruptions, and increased erosion and sedimentation associated with increased impervious surfaces under Alternative 1. Soil disturbance from renovation and construction activities has the potential to temporarily disrupt existing human-made stormwater drainage systems and natural drainage patterns through soil erosion and sediment production. Because construction would disturb more than 1 acre, discharge of stormwater runoff from construction activities must be covered under an NPDES Construction General Permit and authorized by the FDEP. The permit would require development of a site-specific SWPPP that includes soil erosion and sediment controls, and construction site waste control components.

Long-term, minor, adverse impacts on the MacDill AFB stormwater system would be expected from increased runoff due to an increase in impervious surfaces under Alternative 1. Alternative 1 would add approximately 9.4 acres of impervious surfaces. Stormwater control infrastructure, such as culverts, ditches, drains, and piping, would be installed as necessary to control any additional amounts of stormwater runoff and minimize adverse impacts on the stormwater system. Per Section 438 of the EISA, Alternative 1 would implement low-impact development, as appropriate, to help minimize potential increases in stormwater runoff to maintain, to the maximum extent technically feasible, the predevelopment hydrology of the work sites. Additionally, the stormwater system at the sites would be designed to comply with the existing NPDES Multi-Sector General Permit for activities on the airfield (i.e., the facility and infrastructure improvements listed in **Table 2-1**); the MSGP for Storm Water Discharges from Phase II MS4 for discharge from the MS4; and federal, state, and local regulations. If necessary, permit modifications would be implemented to remain in compliance with state stormwater regulatory requirements.

Solid Waste Management. Short- and long-term, negligible to minor, adverse impacts on solid waste management would be expected from increased generation during construction, demolition, renovation, and daily operations. Solid waste generated during construction and renovation activities would consist mainly of building materials such as concrete, metals (e.g., conduit, piping, wiring), lumber, cement, and asphalt; and yard debris such as trees, shrubs, and other vegetation. To maximize landfill diversion rates, contractors would be required to recycle construction and demolition debris in accordance with applicable federal and installation policies and would be required to comply with all DAF guidance regarding disposal of debris, as identified in the ISWMP (MacDill AFB 2021d). Contractors would be responsible for

disposal of non-recyclable debris at permitted waste facilities such as the McKay Bay Refuse-to-Energy Facility.

Table 3-19 summarizes the solid waste anticipated to be generated during construction and renovation activities. Alternative 1 would generate approximately 6,700 tons of construction and demolition debris. Assuming 59 percent of generated debris would be recycled, in alignment with the installation's construction and demolition debris diversion rate, approximately 2,750 tons of waste would be disposed in landfills. In comparison to the approximately 330,000 tons of waste handled annually by the McKay Bay Refuse-to-Energy Facility, this additional waste generation would be negligible. Additionally, waste generation would be spread over the 2-year transition period and would not approach the 1,000 tons per day design capacity of the McKay Bay Refuse-to-Energy Facility. Construction and demolition debris that is not recycled or processed at the McKay Bay Refuse-to-Energy Facility would be disposed in nearby landfills.

Table 3-19. Estimated Construction and Demolition Debris Generated from Alternative 1 at MacDill AFB

Activity	Total Area (square feet)	Multipliers (pounds/square feet)	Debris Generated	
			Pounds	**Tons**
Facility Renovations	107,044	11.31	1,210,668	605
New Facility Construction	25,454	4.34	110,470	55
Facility and Airfield Renovations	909,508	11.31	10,286,535	5,143
Facility and Airfield Additions	421,329	4.34	1,828,568	914
		Total	**11,607,673**	**6,717**

Source: USEPA 2009

Long-term, negligible, adverse impacts on solid waste management would be expected due to the personnel increases associated with Alternative 1. On average, 4.9 pounds of municipal waste was generated per person per day in 2018 (USGS 2018a). Assuming all personnel and their dependents would produce municipal waste at the 2018 rate, an additional approximately 0.69 ton of waste would be generated per day. Assuming 44 percent of generated debris would be recycled, in alignment with the installation's construction and demolition debris diversion rate, an additional approximately 0.46 ton of waste would be disposed at the McKay Bay Refuse-to-Energy Facility daily. The waste facility has sufficient capacity to accommodate the additional demand.

Communications System. Short-term, negligible, adverse impacts on the communications system at MacDill AFB would occur from disruptions under Alternative 1. Disruptions in communications services could occur as new facilities are connected to the existing communications system, such as for the BASH-21 Facility and High Bay/Supply Bulk Warehouse, or as facilities undergoing renovation are disconnected and reconnected to the existing communications system. Because the communications system on MacDill AFB is robust and only 12 percent of the system is currently being used, no long-term impacts are expected.

Airfield. Short-term, minor, adverse impacts on the airfield at MacDill AFB would be expected from the facility and airfield improvement projects. Construction of additional hangar space and renovation/expansion of airfield pavements would be phased to maximize the availability of apron and ramp space so that airfield operations would not be interrupted, and sufficient aircraft parking would remain available. Long-term, minor, beneficial impacts on the airfield at MacDill AFB would occur from the addition of ramp space, expansion of facilities, and replacement of pavements.

Transportation. The anticipated impacts on transportation and transportation services in the region, local community, and at the installation are described below.

Regional Transportation Network. Short-term, negligible, adverse impacts on the regional transportation and roadway network would occur from increased traffic during construction and renovation associated with Alternative 1. These activities would require the delivery and removal of materials to and from construction and renovation sites at the installation. All construction traffic, including equipment and material deliveries as well as commuting work crews, would enter MacDill AFB through the Dale Mabry Gate on Dale Mabry Highway, or the Tanker Way Gate on North Boundary Boulevard. No construction or renovation activities would occur beyond the installation perimeter; therefore, impacts to regional roadways would be traffic-related only. Increased traffic on roadways used to access the installation gates, such as Dale Mabry Highway and Interbay Boulevard, would likely result from the daily commutes of contractors and construction crews, delivery of materials, and removal of construction debris.

Long-term, negligible, adverse impacts on regional roadways near the Dale Mabry Gate, MacDill Gate, and Bayshore Gate, such as Dale Mabry Highway, Interbay Boulevard, and Bayshore Boulevard, could occur from additional personnel commuting to and from the installation daily; however, the increase in traffic likely would not permanently increase traffic beyond the functionality of any regional roadway. Because Alternative 1 would not affect off-installation roadways and would not increase traffic beyond the functionality of any regional roadway, no impacts on regional transit services would occur.

Gate Access. Short-term, minor, adverse impacts on the Dale Mabry Gate and Tanker Way Gate would occur from the addition of construction traffic during the 2-year transition period, including daily commutes from workers and material hauling, which would increase the number of vehicles accessing the installation daily. It is assumed that construction personnel would commute daily to MacDill AFB from off-installation. Contractors and construction crews would likely access the installation using the Dale Mabry Gate, and all commercial vehicles, such as material deliveries, would be required to use the Tanker Way Gate. The greatest congestion at the installation gates would occur during peak travel time, typically 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. The level of impact on traffic volumes at installation gates would be dependent on construction vehicle routes from the Dale Mabry Gate and the Tanker Way Gate, frequency of travel, peak times for construction vehicle activity, and length of the construction periods for the facility and infrastructure projects.

For conservative analysis of installation gate operations, it was assumed additional personnel would access the installation once daily. Long-term, minor, adverse impacts on gate access and processing rates would occur from the net increase of 234 personnel at MacDill AFB. Personnel

living off-installation would commute daily to the installation and would likely access the installation through the Dale Mabry Gate. Personnel living on-installation would not be anticipated to affect gate traffic or processing rates during peak travel times. The capacity of the Dale Mabry Gate is 6,800 vehicles per day, and the gate is operating at maximum capacity. In the case that all 234 additional personnel would access the Dale Mabry Gate at MacDill AFB once daily, additional traffic would represent an approximately 3.6 percent increase in vehicle processing demand, contributing to increased congestion, queueing delays, and travel times. Although most additional commuter traffic would enter and exit the installation during peak travel times, it is likely that some personnel would maintain adjusted working hours and access the Dale Mabry Gate during slower travel times. To reduce the potential for congestion, the installation could adjust the schedule of operations to accommodate the expected increase or provide additional personnel at the gate to process security checks during peak inbound traffic periods, as required. Additionally, some personnel may use other gates such as the Bayshore Gate and Tanker Way Gate, to access MacDill AFB, which would decrease the potential for congestion at the Dale Mabry Gate.

On-installation Transportation. Short-term, minor, adverse impacts on the MacDill AFB transportation and parking network would result from increased contractor-related installation traffic associated with construction, demolition, and renovation under Alternative 1. Contractors and construction crews would access construction sites daily using the on-installation road network. Construction traffic also would include delivery of materials and removal of debris from project sites. The locations of increased traffic and required parking areas would be concentrated on and near the airfield, and within the western portion of the cantonment area. Construction traffic would comprise a small percentage of the total traffic on the installation daily. Many of the construction vehicles would remain within a project site for the duration of the construction period, which would minimize impacts on installation roadways. Any potential increases in traffic volumes associated with the construction and renovation activities would be temporary. Partial or full road closures, traffic pattern changes, and detours due to Alternative 1 would be communicated to installation personnel via electronic signs, bulletins, and memorandums. Additional construction traffic at MacDill AFB would cease once construction activities are completed.

Long-term, negligible, adverse impacts on the MacDill AFB transportation network would occur from the net increase of 234 personnel transiting on the installation daily. Additional traffic would be concentrated within the cantonment area and near the airfield. Additional on-installation traffic also would occur from associated military dependents and family members using installation roadways. No impacts on pedestrian facilities or the on-installation transit service would occur from Alternative 1.

3.3.8 Land Use

The ROI for analysis of effects on land use under each alternative includes the lands and designated uses on the installation and in the immediately surrounding communities (e.g., townships, cities).

3.3.8.1 Affected Environment

Installation. The 2019 *MacDill AFB Installation Development Plan* (IDP) describes physical development on the installation and includes a long-range development plan. The IDP details 11 existing and future land use categories and 6 planning districts. Existing and future land use categories include administrative, airfield, aircraft operations and maintenance, community commercial, community service, accompanied housing, unaccompanied housing, industrial, medical, open space, and outdoor recreation. Compatible land uses have generally been developed within close proximity to one another to achieve functional areas (e.g., aircraft facilities are adjacent to the airfield). The six planning districts (i.e., accompanied housing, administration core, front gate, recreation, south airfield, and west and central airfield) are identified by their character, land use, intensity of development, or the type of activities occurring within them. Military housing, administrative facilities, airfield operations and maintenance facilities, commercial facilities, and community services are generally within the northeastern portion of the installation; the airfield comprises the central and western portions of the installation; open space and industrial areas comprise the northwestern, southwestern, and southern portions of the installation; and a large recreational area is within the southeastern portion of the installation (MacDill AFB 2019d).

The proposed facility construction, demolition, and renovation projects would be located primarily within the aircraft operations and maintenance, airfield, and industrial land use categories; and the Education Center/Airmen Leadership School would occur within the community service land use category. Land use categories adjacent to the Project Area are primarily similar, but also include the administrative, community commercial, outdoor recreation, and unaccompanied housing land use categories. Most of the Project Area falls within the administration core planning district, but the Bird Bath project occurs within the west and central airfield district, and the ATGL Storage Building, DASH-21 Facility, and FUT projects occur within the front gate planning district. The administration core planning district includes most of the operational facilities on MacDill AFB. The front gate planning district provides a variety of functions, from community commercial uses to high-profile DoD mission facilities. The west and central airfield district is primarily composed of the airfield area (including Runway 05/23, most of the taxiways, and the Air Traffic Control tower), but also includes POL storage tanks, the Tanker Way Gate, aircraft operations and maintenance areas, and open space (MacDill AFB 2019d).

MacDill AFB implements and maintains land use restrictions and controls at most Environmental Restoration Program (ERP) and Military Munitions Response Program (MMRP) sites to prevent certain types of land uses and thereby protect the installation population from unacceptable exposure to contaminants. LUCs apply to sites where cleanup actions are ongoing as well as at sites where response actions are complete. The MacDill AFB *Fifteenth Annual Basewide Monitoring Report* and individual LUC Implementation Plans detail the 18 ERP sites with LUCs in place at MacDill AFB in association to past and current restoration projects. No MMRP sites occur within the Project Area. Four ERP sites with similar LUCs coincide with the Project Area (Solid Waste Management Unit [SWMU] 35, Buildings 518/552; SWMU 61; SWMU 76; and Site 57, Former Pumphouse 75), and additional ERP sites are in the surrounding area. These ERP sites within the Project Area are subject to LUCs that implement restrictions against residential

land uses and contaminated groundwater usage (MacDill AFB 2006, 2008a, 2008b, 2008c, 2021f). An additional LUC is in place at SWMU 35, Buildings 518 and 552, that requires impervious surfaces within the site be maintained to serve as an engineering control by preventing exposure to contaminants in the soil (MacDill AFB 2008b). Refer to **Section 3.3.9.1** for additional details on these ERP sites.

MacDill AFB's Air Installation Compatible Use Zone (AICUZ) program provides guidelines for compatible land use within CZs, APZs I and II, and noise zones (NZs) ranging from 60-dBA DNL to greater than 80-dBA DNL (MacDill AFB 2008c). CZs and APZs are areas where non-airfield development is constrained or discouraged for airfield safety. The DAF's land use guidelines for noise exposure recommend a 65-dBA DNL threshold for noise-sensitive land uses (see **Table 3-1**) (DAF 2017c). No on-installation noise-sensitive land uses (e.g., residences, schools, churches, hospitals) fall within the CZs, APZs, or NZs (MacDill AFB 2019d, DAF 2018b). Refer to **Figure 3-1** and **Section 3.3.1** for more information on the existing noise environment at MacDill AFB.

Surrounding Areas. The northern boundary of MacDill AFB is adjacent to the municipal boundary of the City of Tampa, and water surrounds the installation to the east (Hillsborough Bay), south (Tampa Bay), and west (Old Tampa Bay) (MacDill AFB 2019d). The City of Tampa zoning ordinance establishes zoning districts, regulations, and standards within the city limits, and has planning and zoning jurisdiction over land adjacent to MacDill AFB's northern boundary. It does not have zoning jurisdiction over federal lands. Land use immediately adjacent to the installation boundary is predominantly industrial, public/quasi-public space, residential, and public communications/utilities. The surrounding area is similar, but also includes areas of mixed commercial use (Hillsborough County 2021, City of Tampa 2021).

The location of MacDill AFB in an urban setting increases the potential for encroachment and incompatible land uses. The City of Tampa continues to implement compatible land use policies in its planning efforts (MacDill AFB 2019d). The following policies are some of those included in the latest *Tampa Comprehensive Plan* (City of Tampa 2016), which includes policies and objectives meant to support and strengthen the role of MacDill AFB in the region:

- Limit all new residential development within the MacDill AFB flight path to 10 dwelling units per acre
- Prohibit new construction and redevelopment that inhibits the safe and efficient operation of airport facilities within the flight path of MacDill AFB
- Prohibit future noise-sensitive development (e.g., residences, schools, hospitals) without the required noise attenuation features within the MacDill AFB NZs
- Include MacDill AFB in the Development Review process to maintain open communication regarding all petitions for rezoning and special use requests generally within the MacDill AFB flight path
- Continue to consult the MacDill AFB AICUZ Report and Compatibility Use District recommendations when addressing proposed land use changes within the MacDill AFB flight path
- Continue to promote compatible development within the MacDill AFB flight path through maintenance of reduced densities

- Amend the City of Tampa Code of Ordinances to include noise attenuation measures to achieve a maximum outdoor to indoor noise level of 30 dB for residential development within the 70-dBA DNL noise contour, or a lesser dB for any portion of the property located in a lower dBA DNL noise contour.

Additionally, an updated Joint Land Use Study (JLUS) is planned to be conducted by the City of Tampa and MacDill AFB (City of Tampa 2020). The JLUS will analyze each AICUZ in depth and make recommendations regarding development issues adjacent to the installation. The previous JLUS between the City of Tampa and MacDill AFB was conducted in 2006 and reviewed and recommended compatible land uses adjacent to MacDill AFB to protect the health, safety, and welfare of the surrounding community (DAF 2018b).

MacDill AFB conducted an AICUZ Study in 2008 that recommended land use guidelines for land surrounding the installation in the City of Tampa to assist in preparing their local land use plans. The CZ and APZs at the southern end of the runway do not have any adjacent conflicting land uses because they overlay water; however, at the northern end of the runway, private acreage lies within the CZ and residences lie within the APZs (see **Table 3-20**) (MacDill AFB 2008c, 2019d). Some off-installation residential areas are also located within the 65- and 70-dBA DNL noise contours, or NZs. Refer to **Section 3.3.1** for more information on the existing noise environment in the areas surrounding MacDill AFB.

Table 3-20. Off-Installation Acreage within MacDill AFB AICUZ

AICUZ	Off-Installation Acreage[a]
CZ[b]	36
APZ I	526
APZ II	964
60–64 dBA DNL NZ	1,266
65–69 dBA DNL NZ	243
70–74 dBA DNL NZ	12
75–69 dBA DNL NZ	0
80+ dBA DNL NZ	0

Source: MacDill AFB 2008c

[a] Acreage values are not additive because CZs and APZs overlap with NZs
[b] No residential areas are within the CZ
Key: CZ = Clear Zone; dBA = "A" Weighted Decibel; APZ = Accidental Potential Zones; DNL = day-night average sound level; NZ = Noise Zone

Coastal Zone Consistency Review. The Florida Coastal Management Program (FCMP), approved by the National Oceanic and Atmospheric Administration in 1981 and codified at Florida Statutes Chapter 380 Part II, consists of a network of nine state agencies and five regional water management districts. These agencies and districts implement 24 statutes that protect and enhance the state's natural, cultural, and economic coastal resources. MacDill AFB is within Florida's coastal zone and maintains consistency with the enforceable policies of the FCMP to the maximum extent practicable. A consistency determination review has been conducted for Alternative 1 and is provided in **Appendix A**.

3.3.8.2 Environmental Consequences

3.3.8.2.1 Analysis Methodology

A comparative methodology is used to determine potential impacts on land use. Construction or modification activities and operations associated with each alternative are examined and compared to existing land use conditions. Impacts are evaluated as they relate to the following:

- Compatibility of the proposed activities with existing land use and land use designations at the Project Area and in the surrounding areas
- Availability of sufficient land within the appropriate land use designation for the proposed activities.

Land use impacts from Alternative 1 would be considered significant if the effect was inconsistent or noncompliant with land use management plans or policies, precluded the viability of existing land use, precluded continued use or occupation of an area, was incompatible with adjacent land use to the extent public health or safety is threatened, or conflicted with planning criteria established to ensure the safety and protection of human life.

Land use compatibility is defined here as the ability of two or more land uses to coexist without conflict. Examples of conflicts include interference of proposed activities with existing activities; insufficient availability of facilities, infrastructure, or resources to safely accommodate a proposed activity; and activities resulting in human health and safety issues due to poor siting. Frequently, compatibility between land uses exists in varying degrees based on the frequency, duration, and intensity of a proposed activity. The land use designations preclude proposed activities from being located within a designation that would be incompatible with the current or proposed uses. An activity could be collocated within a land use designation with which it is not normally associated based on evaluation of its compatibility with nearby activities, including consideration of the availability of facilities and infrastructure, safety of personnel, and sensitivity of environments. Potential impacts on land use compatibility are based on qualitative assessments. Land disturbance within a given land use designation is not considered a land use impact under these criteria unless the disturbance results from a project that is incompatible with the land use designation.

3.3.8.2.2 Alternative 1

No impacts on land use from the addition of personnel and dependents at MacDill AFB would occur. Personnel and dependents would be housed in existing residential areas both on- and off-installation. Existing installation childcare, housing, fitness, medical, and dining facilities and services would support the proposed 24 KC-46A PAA personnel, family members, and dependents.

Installation. Alternative 1 would have short-term, negligible to minor, adverse impacts on installation land use from increased noise and potentially constrained access of nearby facilities due to construction, demolition, and renovation actions and requirements to temporarily fence areas for public safety. Long-term, minor, beneficial impacts on installation land use from more efficient use of land and decreased land area within NZs. Short-term, minor, adverse impacts would result from temporary increases in noise levels during construction, demolition, and renovation. The associated noise levels would not result in areas of incompatible land use or

preclude the viability of the existing land uses. Refer to **Section 3.3.1.2** for additional information on potential impacts from construction noise under Alternative 1. Additional short-term, adverse impacts would occur from a temporary reduction in facility, airfield ramp, and hangar availability for operational use during construction, demolition, or renovation. These impacts would be negligible because phased use of these resources would allow construction to occur in support of the 24 KC-46A PAA, and facilities would remain in use during renovations, resulting in minimal disruptions to ongoing operations. No impacts on land use from ground disturbance or operations in ERP sites would occur because MacDill AFB would adhere to the appropriate LUCs during construction, demolition, and operations. The construction contractor would develop BMPs in accordance with site-specific LUCs (e.g., access, digging, groundwater contact restrictions) and obtain all necessary permits prior to ground disturbance. Refer to **Section 3.3.9.2** for additional information on potential impacts from the proposed activities within ERP sites.

Long-term, minor, beneficial impacts would occur because the proposed construction, demolition, and renovation projects would result in an efficient use of installation land and would not conflict with existing or future uses on the installation. Facility construction and renovation would consolidate like functions and increase efficiency, and facility demolition would remove outdated and underused portions of facilities or infrastructure. Additionally, the proposed projects would be compatible with the existing and future land use categories as well as the planning districts identified in the MacDill AFB IDP (MacDill AFB 2019d). New developments would be constructed in accordance with DAF policies with regard to CZs and APZs. No land use designations would change from the 24 KC-46A beddown on the installation. Construction or renovation projects within the proposed NZs would include acoustical design considerations for façade elements and interior design requirements (per UFC 3-101-01), as appropriate.

Despite the proposed increase in operational activity, long-term, minor, beneficial impacts on on-installation land use would result from the 3-acre decrease in on-installation land area exposed to 65 dBA DNL or greater during aircraft overflights (see **Figure 3-2**). The reduced exposure would occur because the KC-46A aircraft is generally quieter than the KC-135 aircraft. Additionally, the frequency and volume of intermittent noise events that could temporarily and briefly disrupt on-installation residential, commercial, and recreational uses would decrease in some locations and remain the same in other areas (refer to **Section 3.3.1.2.2** for more detail). The operations and maintenance associated with the beddown of 24 KC-46A PAA would be compatible with the existing and future land uses on MacDill AFB.

Surrounding Areas. No impacts from the proposed construction, demolition, or renovation projects on off-installation land use would be expected because MacDill AFB has the physical real estate and infrastructure required to beddown the 24 KC-46A PAA and would not need land outside the installation boundaries. The temporary increases in noise levels during construction, demolition, and renovation would not impact off-installation areas.

Long-term, minor, beneficial impacts on off-installation land use would result from the 32-acre decrease in off-installation land area exposed to 65 dBA DNL or greater during aircraft overflights, allowing for potential compatibility with a greater variety of development on those off-installation areas. The acreage of residential land uses within the MacDill AFB NZs would

decrease, thereby decreasing the area of incompatible land use adjacent to the installation. This reduction would help MacDill AFB meet its strategic goals for sustainable development that facilitates the continuation of MacDill AFB's mission without compromise while minimizing adverse impacts on the surrounding environment (MacDill AFB 2019d). The frequency and volume of intermittent noise events that could temporarily and briefly disrupt residential, commercial, and recreational uses in some locations would be reduced (refer to **Section 3.3.1.2.2** for more detail). Long-term, negligible, adverse impacts could occur on off-installation land use in some residential areas due to an increase in annual potentially sleep disturbing events from the increase in nighttime closed pattern operations under Alternative 1.

Coastal Zone Consistency Review. Alternative 1 would be consistent with the FCMP. porta

3.3.9 Hazardous Materials and Waste

The ROI for the analysis of hazardous materials and wastes effects under each alternative includes the Project Area where proposed construction, demolition, renovation, and operations would occur.

3.3.9.1 Affected Environment

Hazardous Materials, Petroleum Products, and Hazardous Wastes. MacDill AFB uses hazardous materials and petroleum products such as liquid fuels, pesticides, and solvents for everyday operations. The use of these hazardous materials and petroleum products results in the generation and storage of hazardous wastes and used petroleum products on the installation. MacDill AFB is a RCRA Large Quantity Generator (United States Environmental Protection Agency [USEPA] identification number FL6570024582). RCRA Large Quantity Generators generate 1,000 kilograms per month or more of hazardous waste, or more than 1 kilogram per month of acutely hazardous waste. Of the facilities affected by Alternative 1, hazardous materials, hazardous wastes, and petroleum products are currently used and generated at Hangars 1, 2, 3 and 4; Building 552; Building 6; and Building 1071 (MacDill AFB 2019d, 2021g).

MacDill AFB operates a Type III jet fuel hydrant system on the aircraft parking ramp and uses multiple ASTs for the bulk storage of jet fuel. The total jet fuel storage capacity of MacDill AFB is approximately 6.9 million gallons (MacDill AFB 2019d).

MacDill AFB has implemented an installation-specific Hazardous Waste Management Plan, an SPCC Plan, and a Facility Response Plan. These plans define roles and responsibilities, address record keeping requirements, and provide spill contingency and response requirements with regards to hazardous materials and wastes (MacDill AFB 2021g, 2021h, 2021i).

Toxic Substances. Known asbestos containing materials (ACMs) on MacDill AFB are managed in accordance with the installation's asbestos management and operations plan (MacDill AFB 2020d). The plan provides documentation for all asbestos management efforts and procedures for overseeing the MacDill AFB asbestos management program. The plan assigns responsibilities, establishes inspection and repair processes, and provides personnel protection instructions. Known ACMs that do not require immediate abatement are managed in-place until conditions require their removal, or until renovation or demolition activities occur. The

purpose for in-place management and abatement is to minimize potential asbestos exposure to base personnel, their families, and maintenance and construction personnel. All the facilities to be renovated or expanded at MacDill AFB could contain potentially ACMs because some construction materials still contain asbestos (ATSDR 2022).

The installation's lead-based paint (LBP) management plan provides guidance on how to protect DAF personnel and the public from exposure to LBP as well as the management and disposal of LBP (MacDill AFB 2015). Hangars 1 through 5, Building 53, and Building 55 could contain LBP because they were built before 1978. Hangars 1 through 5, Building 53, and Building 55 also have the greatest potential to contain polychlorinated biphenyls (PCBs) in their building materials because they were built before 1979. Older electrical infrastructure, such as light fixtures and surge protectors, within these buildings might also contain PCBs.

Environmental Contamination. As of 2021, 28 active ERP and 5 active MMRP sites occur on MacDill AFB (MacDill AFB 2021f, DENIX 2022a). This EIS focuses only on those sites that have potential to be impacted by Alternative 1. ERP and MMRP sites that require no further action or do not directly coincide with the Project Area would not be impacted by the proposed activities and are not evaluated further. None of the MMRP sites on MacDill AFB coincide with the Project Area (DENIX 2022b). The four ERP sites that occur within the Project Area are described below, and the projects that coincide with the sites are outlined in **Table 3-21** and shown on **Figure 3-8**.

SWMU 35, Buildings 518 and 552. Building 518 is located on the western side of South Boundary Boulevard and consists of a former aircraft washrack and oil water separator (OWS). The potential wastes that may be processed through this OWS are oil, grease, fuel, degreaser, lubricants, sand, and detergents. Building 552 is located on the north side of Hangar Loop Drive at its intersection with South Boundary Boulevard. The potential wastes that may have been processed through this OWS are the same as those processed through the OWS at Building 518, but also included antifreeze and hydraulic fluids. The approved remedy for contamination at both locations includes excavation and disposal of contaminated soils (i.e., those with contaminant concentrations above industrial standards), and the implementation of LUCs. LUCs include restrictions against residential land uses and contaminated groundwater usage, as well as the maintenance of impervious surfaces within the site that serve as an engineering control by preventing exposure to contaminants in the soil (MacDill AFB 2008b, 2021g).

SWMU 61. This ERP site consists of an approximately 148-acre chlorinated solvent plume that extends from the flightline to Hillsborough Bay. The plume is within the industrial area of the installation, which is composed primarily of aircraft taxiways, roadways, hangars, office buildings, and supporting structures. The selected remedy at SWMU 61 includes in situ groundwater treatment, which has occurred, and implemented LUCs prohibit residential land uses and the use of groundwater from within the site. Annual groundwater monitoring is in place to verify the plume will dissipate (MacDill AFB 2006, 2021g).

SWMU 76. This ERP site is located within the Aircraft Hangar Complex surrounding the five primary aircraft hangars. Soil contamination and chlorinated solvent plumes resulting from past aircraft maintenance activities, two used oil collection sites, two hazardous waste storage areas, and three OWSs have been identified on the site. The selected remedy at SWMU 76 includes

contaminated soil removal, and in situ groundwater treatment. LUCs prohibit residential land uses and the use of groundwater from within the site. Annual groundwater monitoring is in place to verify the plume will dissipate (MacDill AFB 2008a, 2021g).

Table 3-21. ERP Sites within the MacDill AFB Project Area

Project	ERP Site
Facility Renovations	
ATGL Storage; Building 1042	SWMU 61
MPC/AFE; Building 6	SWMU 61
Active Duty ARSs x 2; Building 56	SWMU 61
AFRC ARSs x 2; Building 53	None
AFRC Operations Squadron Support; Building 9	SWMU 76
FUT; Building 1071	SWMU 61
Bird Bath; Building 1359	None
Washrack; Building 580	SWMU 61 and SWMU 35, Buildings 518/552
AGE Washrack; Building 564	SWMU 61 and SWMU 35, Buildings 518/552
New Facility Construction	
DASH-21 Facility	Site 57, Former Pumphouse 75
High Bay Supply/Bulk Storage Warehouse	None
Facility and Airfield Improvements	
AGE; Construct Jack Testing Pad in Maintenance Building; Building 552[a]	SWMU 61 and SWMU 35, Buildings 518/552
FUT Parking	SWMU 61
Education Center/Airmen Leadership School; Building 252	None
Corrosion Control Hangar 1	SWMU 76
General Purpose MX Hangar 2	SWMU 76
General Purpose MX Hangar 3	SWMU 76
General Purpose MX Hangar 4	SWMU 76
Fuel Cell Hangar 5	SWMU 76
Wheel and Tire Shop; Building 44	SWMU 76
BOT; Building 295	None
AMU; Building 55	None
Expand Alpha Ramp	Site 57, Former Pumphouse 75 and SWMU 61
KC-46A Hardstands	SWMU 61
Repair Asphalt	SWMU 61 and SWMU 76

Source: MacDill AFB 2021f
[a] Add/Alter AGE and Construct Jack Testing Pad in Maintenance Building are two separate projects that occur in the same building. Therefore, they have been combined into one row for the sake of determining ERP site overlap.
Key: ATGL = Air Transportable Galley/Lavatory; SWMU = Solid Waste Management Unit; MPC/AFE = Mission Planning Center/Aircrew Flight Equipment; ARS = Air Refueling Squadron; AFRC = Air Force Reserve Command; FUT = Fuselage Training; AGE = Aerospace Ground Equipment; MX = Maintenance; BOT = Boom Operator Training; AMU = Aircraft Maintenance Unit; ERP = Environmental Restoration Program

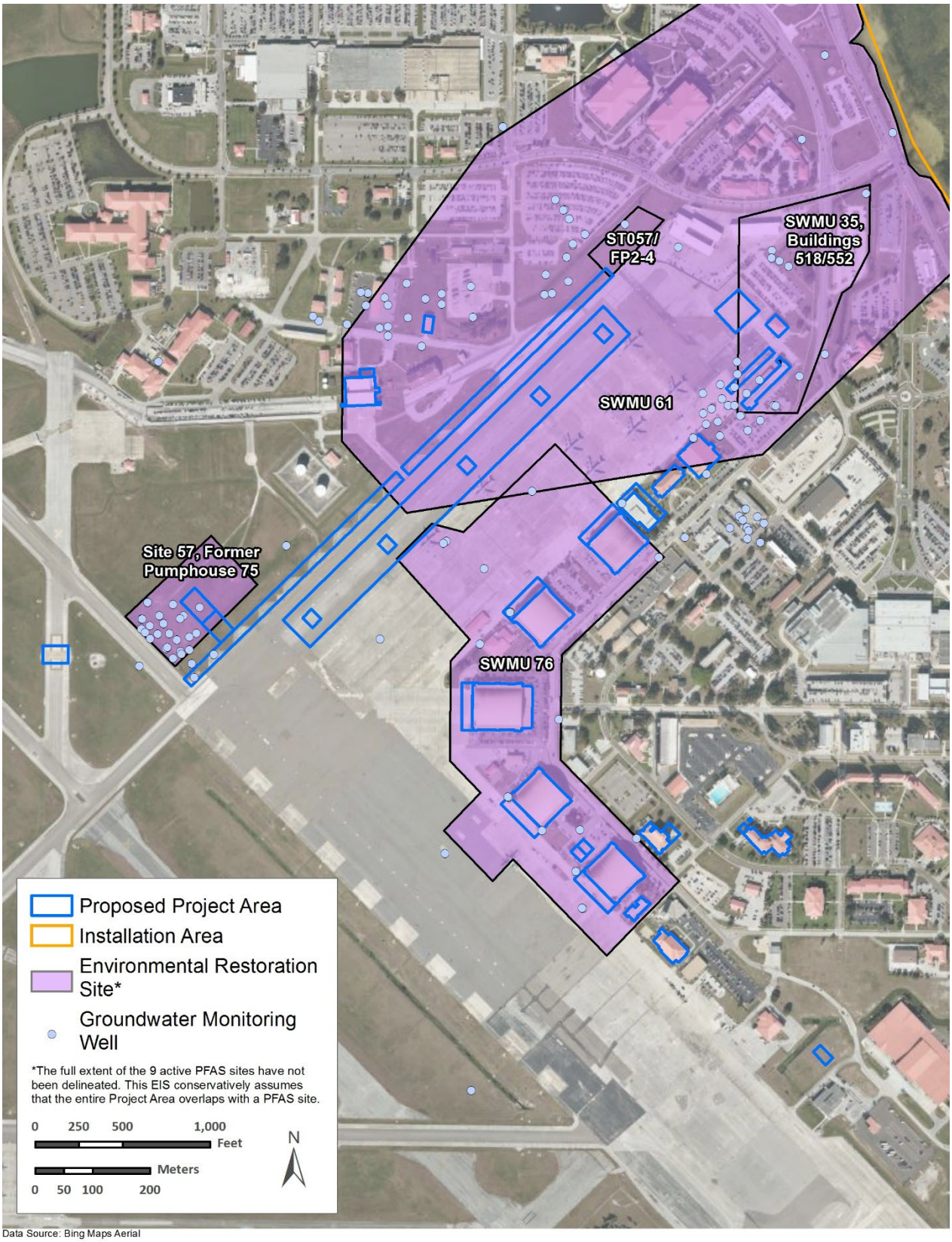


Figure 3-8. ERP Sites and Groundwater Monitoring Wells in the ROI at MacDill AFB

Site 57, Former Pumphouse 75. This ERP site contains former Pumphouse 75, which was part of the flightline refueling system that comprises Site 57. The pumphouse supplied fuel via 50,000-gallon USTs, resulting in hydrocarbon contamination of soil and groundwater. The pumphouse was taken out of service, all USTs were removed, and the pumphouse building was demolished in 2009. The associated fuel pipeline was cleaned, sealed, and abandoned in place. The site is currently an open grassy field located on the northern corner of the intersection of Taxiway E and the North Apron Taxiway. The selected remedy at Site 57 includes contaminated soil removal and in situ groundwater treatment. LUCs prohibit residential land uses and the use of groundwater from within the site (MacDill AFB 2011, 2021g).

Per- and Polyfluoroalkyl Substances. DAF has initiated a study of historical firefighting foam releases and the potential for chemicals contained in firefighting foam to have contaminated groundwater. Perfluorooctanaoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are two such chemicals and both were detected on MacDill AFB at nine sites in the vicinity of the airfield. These areas are currently being investigated to determine the extent of PFAS contamination; however, there are no surface water to groundwater or groundwater pathways that can reach off-installation drinking water wells (MacDill AFB 2018b, 2021c). PFOA and PFOS are compounds that have low potential for vapor intrusion (DAF 2018b, AFCEC 2019). For the purposes of this analysis, the entire MacDill AFB Project Area is assumed to occur within a PFAS-contaminated area.

Radon. USEPA rates Hillsborough County, Florida, as Radon Zone 2. Counties in Zone 2 have a predicted average indoor radon screening level between 2 and 4 picocuries per liter (pCi/L; USEPA 2022b), which is below the USEPA established guidance radon level of 4 pCi/L in indoor air for residences.

3.3.9.2 Environmental Consequences

3.3.9.2.1 Analysis Methodology

Impacts on or from hazardous materials and waste under Alternative 1 would be considered significant if they would result in noncompliance with applicable federal or state regulations, or increase the amounts of hazardous materials or waste generated or procured beyond current management procedures, permits, and capacities. Impacts on contaminated sites would be considered significant if a proposed action would disturb or create contaminated sites, resulting in negative impacts on human health or the environment, or if a proposed action would make it substantially more difficult or costly to remediate existing contaminated sites.

3.3.9.2.2 Alternative 1

Hazardous Materials, Petroleum Products, and Hazardous Wastes. Short-term, minor, adverse impacts would occur from the use of hazardous materials and petroleum products as well as the generation of hazardous wastes during the proposed construction, demolition, and renovation. Hazardous materials that could be used include paints, welding gases, solvents, preservatives, and sealants. Additionally, hydraulic fluids and petroleum products, such as diesel and gasoline, would be used by the heavy vehicles and equipment. Onsite storage of petroleum products for construction, renovation, and demolition would be accomplished through the installation of temporary diesel and gasoline ASTs, as necessary. These ASTs would be removed following the completion of construction, renovation, and demolition. Construction,

demolition, and renovation would generate negligible quantities of hazardous wastes. These quantities would not be expected to exceed the capacities of the existing hazardous waste disposal streams on MacDill AFB. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and state laws, and the MacDill AFB Hazardous Waste Management Plan. All hazardous materials, petroleum products, and hazardous wastes used or generated during construction would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations and the MacDill AFB SPCC Plan to minimize the potential for releases. All construction equipment would be maintained according to the manufacturer's specifications, and drip mats would be placed under parked equipment as needed. Hazardous materials, hazardous wastes, and petroleum products currently within the affected portions of Hangars 1, 2, 3, and 4; Building 552; and Building 6 would be relocated to similar facilities or properly disposed to accommodate building renovation.

Long-term, negligible, adverse impacts would occur from the increased use of hazardous materials and petroleum products as well as the increased generation of hazardous wastes following the beddown of 24 KC-46A PAA due to the proposed 15 percent increase in aircraft operations. The installation's existing fuel storage and delivery infrastructure has sufficient capacity for the increased throughput, and MacDill AFB would continue to dispense fuel through the existing Type III hydrant system. Permanent ASTs and USTs would not be installed or removed, and the proposed additions to the hydrant fuel system would support the specialized configuration of the KC-46A PAA.

An increase in aircraft operations would potentially result in an increase in aircraft maintenance activities and associated increased use of hazardous materials and generation of hazardous waste. If needed, hazardous materials storage and hazardous waste collection points could be established in a proposed facility. The use of hazardous materials and/or petroleum products and the generation of hazardous wastes would continue at Hangar 1 (Corrosion Control Hangar), Hangar 2 (General Purpose MX Hangar), Hangar 3 (General Purpose MX Hangar), Hangar 4 (General Purpose MX Hangar), Building 6 (Mission Planning Center/Aircrew Flight Equipment [MPC/AFE]), Building 552 (AGE storage and parking), and Building 1071 (FUT Facility) due to the activities that would occur in these facilities under Alternative 1. The use of hazardous materials and/or petroleum products and the generation of hazardous wastes could occur at Building 1042 (ATGL Storage), Building 1395 (Bird Bath), Building 580 (Washrack), Building 564 (AGE Washrack), Hangar 4 (General Purpose Mx Hangar), Hangar 5 (Fuel Cell Hangar), Building 44 (Wheel and Tire Shop), Building 55 (AMU), the DASH-21 Facility, and the High Bay Supply/Bulk Storage Warehouse. The MacDill AFB Hazardous Waste Management Plan, SPCC Plan, and Facility Response Plan would be amended, as needed, for any new hazardous materials, hazardous waste, or petroleum product capabilities. These plans would continue to be followed to lessen the potential for a release, and provide spill contingency and response requirements. Additionally, the potential for contamination to occur would be minimized through the use of secondary containment for the storage of petroleum products. If needed, a FDEP Industrial Wastewater Permit would be obtained for operation of the proposed Washrack and AGE Washrack.

Toxic Substances. Short-term, minor, adverse impacts from toxic substances would occur during facility demolition and renovation because these activities could disturb ACMs, LBP, and PCBs in the facilities, or facility components, to be renovated or removed. Surveys for toxic substances would be completed, as necessary, by a certified contractor prior to work activities to ensure that appropriate measures are taken to reduce potential exposure to, and release of, these toxic substances. Contractors would wear appropriate personal protective equipment (PPE) and would be required to adhere to all federal, state, and local regulations as well as the installation's management plans. All ACM- and LBP-contaminated debris would be disposed at an USEPA-approved landfill. New building construction would not include these toxic substances because federal policies and laws prevent their use in building construction applications, and building materials that do not contain these substances are available. Long-term, beneficial impacts would occur from reducing the potential for future human exposure to these toxic substances by reducing the amount of ACMs, LBP, and PCBs at MacDill AFB.

Environmental Contamination. Short-term, minor, adverse impacts would occur because some facility construction, demolition, and renovation would coincide with active ERP sites (see **Table 3-21** and **Figure 3-8**). Prior to the start of any construction, demolition, or renovation that would result in ground disturbance, the DAF would coordinate with the MacDill AFB ERP office to ensure that ground disturbance is coordinated with ongoing remediation and investigation activities. The ERP office would ensure necessary consultation and coordination is completed with the USEPA and FDEP, as required. SWMU 35, Buildings 518 and 522; SWMU 61; SWMU 76; and Site 57, Former Pumphouse 75 include areas of groundwater contamination; therefore, contractors would take appropriate groundwater control measures should ground disturbance reach the depth of groundwater, including regular cleaning of floors and ground surfaces around the disturbance, use of secondary containment, and use of dry solvents to collect spills. The proposed facilities would not impair the ability to monitor the ERP sites within the Project Area because any existing groundwater monitoring wells or treatment systems would be protected or relocated during ground-disturbing activities associated with Alternative 1. SWMU 35, Buildings 518 and 522; SWMU 76; and Site 57, Former Pumphouse 75 also contain areas of soil contamination above residential limits, but below commercial limits. Contractors would develop BMPs in accordance with site-specific contamination (e.g., access, digging, groundwater contact restrictions) and would obtain all necessary permits prior to ground disturbance. Proper characterization, handling, and disposition procedures for contaminated groundwater and soils would be followed.

Contractors performing ground-disturbing activities could encounter undocumented soil or groundwater contamination. If soil or groundwater that is believed to be contaminated was discovered, the contractor would be required to immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Commencement of field activities would not continue in this area until the issue was investigated and resolved. The unexpected discovery of unexploded ordnance is unlikely due to the distance of the Project Area from MMRP sites and proximity to previously disturbed ground.

No long-term impacts would occur from operations within the ERP sites because the operation of proposed facilities would not conflict with the LUCs (e.g., restrictions against residential land

uses, restrictions against usage of contaminated groundwater, maintenance of impervious surfaces) at these ERP sites.

PFAS. Short-term, minor, adverse impacts would occur because facility construction, demolition, and renovation would coincide within PFAS-contaminated sites. The DAF continues to sample for and investigate PFOA and PFOS in accordance with regulatory health advisories. Ground-disturbing activities associated with construction, demolition, and renovation are likely to coincide with soil and groundwater contamination resulting from historic PFOA and PFOS releases. These activities within the footprint of PFOA and PFOS soil contamination would be subject to environmental requirements for the handling and disposition of the groundwater and soil. All ground-disturbing activities would be coordinated with the MacDill AFB ERP office, which would ensure necessary environmental regulatory consultation and coordination occurs. No impacts on the use of the proposed facilities within PFAS-contaminated areas would be expected because there are no pathways from these areas to drinking water sources and PFOA and PFOS have low potential for vapor intrusion.

Radon. Long-term, negligible, adverse impacts from radon are possible but unlikely from construction, demolition, and renovation under Alternative 1. A low potential for elevated indoor radon levels exists in Hillsborough County; therefore, it is unlikely the new and renovated buildings would have indoor radon screening levels greater than 4 pCi/L. Post-construction radon management measures, such as installing ventilation systems to remove radon that has already entered the building, would be installed should any building test higher than 4 pCi/L.

3.3.10 Health and Safety

The ROI for analysis of effects on health and safety under each alternative includes the entire installation and surrounding communities.

3.3.10.1 Affected Environment

Flight Safety. Approximately 738 acres of off-installation land area are within the MacDill AFB CZs and APZs. Of that acreage, 268 acres are recreational, open space, agriculture, or low density; 429 acres are residential; 15 acres are commercial; 5 acres are industrial; and 21 acres are public or quasi-public. The City of Tampa has included the installation's AICUZ data and recommendations in its comprehensive planning and zoning process since the late 1980s (MacDill AFB 2019d).

No Class A aircraft mishaps involving KC-135s have occurred on or near MacDill AFB. One Class A mishap occurred on the installation in 2012 when a Canadian Armed Forces CC-144A Challenger 600 jet suffered a bird strike while on approach (ASN 2022a).

The KC-46A, like other tanker aircraft, has the ability to jettison fuel; this action is typically required only during emergencies to quickly reduce the weight of the aircraft to within the airframe's required weight range for a safe landing. Data on historical tanker operations show that slightly less than 2 sorties per 1,000 (0.2 percent) resulted in a release of fuel (AMC 2013). In accordance with DAF policies, pilots must follow existing flight protocols and air safety instructions in AFI 11-202V3, Air Command Supplement, *Flying Operations: General Flight Rules* (Corrective Actions Applied March 25, 2021); and AFI 11-2KC-135, *Flying Operations:*

KC-135 Operations Procedures (September 10, 2019). These policies require that pilots avoid fuel jettison unless safety of flight dictates immediate jettison. If required, pilots must complete jettison notification and approval protocols, and should jettison the fuel, if possible, at an altitude greater than 20,000 feet AGL to minimize the potential for effects on human health (AMC 2013).

Bird/Wildlife Aircraft Strike Hazard at MacDill AFB and Vicinity. As discussed in **Section 3.3.2**, the MacDill AFB BASH program seeks to minimize risk potential through the manipulation of wildlife populations using passive (vegetation height control, seeding of bare areas, pond/ditch management) and non-passive (bioacoustics, pyrotechnics, trapping, translocation) techniques. The 2019 MacDill AFB BASH Plan provides guidance for reducing the incidents of bird strikes in and around areas where MacDill AFB flying operations occur. The plan establishes provisions to disperse information on specific bird hazards and procedures for reporting hazardous bird activity. As a tropical, coastal installation, bird strikes at MacDill AFB are a substantial concern. Primary species of BASH concern at MacDill AFB are turkey vulture/black vulture, brown pelican/white pelican, gulls, resident waterfowl (heron, spoonbill, egret, ibis, stork, duck, cormorant), and bald eagle (MacDill AFB 2022b). The installation has a 5-year Memorandum of Understanding with the USDA for bird and wildlife control at the installation. Bird populations at the installation spike during late fall and early spring in conjunction with migratory patterns (MacDill AFB 2019a).

MacDill AFB has three BASH inspection and habitation areas: Area A (runway plus 1,500-foot buffer to the left and right, and the extent of the CZ); Area B (other airfield areas including taxiways, aprons, refueling pits, and infield areas); and Area C (areas of hangars and support buildings) (MacDill AFB 2019a). The Project Area under Alternative 1 would coincide with all three areas.

Occupational Safety. Occupational/operational safety at MacDill AFB is maintained through adherence to federal, DoD, and DAF safety policies and plans.

Weapons/Public Safety. Explosive Safety Quantity Distance (ESQD) arcs cover a substantial portion of the airfield and a small tract of land south of the airfield surrounding the munitions storage area. Few munitions however are stored at the installation, and the munitions are not highly explosive. Most of the land that is encompassed by ESQD arcs is undevelopable because of its location on the airfield or its designation as a wetland (MacDill AFB 2019d).

Emergency Services. The 6th Civil Engineer Squadron Fire Emergency Services Flight provides fire and emergency services on MacDill AFB. In March 2017, MacDill AFB became the first DAF installation to partner with a local government to provide advanced life support and transportation services. While the installation has a clinic, serious medical situations require services that Tampa Fire Rescue is trained to provide. An agreement was developed that was designed to ensure that the installation meets the Pentagon rule requiring response times within 12 minutes. MacDill AFB opened a new ambulance bay and bunkhouse to house Tampa Fire Rescue personnel and provides a dedicated ambulance. Tampa Fire Rescue provides eight personnel during the three shifts it operates each day at the installation (Altman 2017).

3.3.10.2 Environmental Consequences

3.3.10.2.1 Analysis Methodology

Installation, flight, and ground operational protocols for the proposed KC-46A under Alternative 1 were assessed to determine the associated risks as well as the installation's capacity for risk management and emergency response to manage that risk by responding to emergencies.

Impacts on safety are assessed according to the potential to increase or decrease safety risks on personnel, the public, and property. The development activities under Alternative 1 were considered to determine whether additional or unique safety risks are associated with its implementation. An impact on safety would be considered significant if it would cause a major variance from baseline conditions of the affected environment for the following:

- Substantially increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community
- Substantially hinder the ability to respond to an emergency
- Introduce a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans in place.

3.3.10.2.2 Alternative 1

Flight Safety. No impacts on flight safety would be expected at MacDill AFB because there would be no change in the number of aircraft operating or type of operations under Alternative 1. Because an aerial refueling mission (i.e., KC-135) already exists on the installation, transition to the KC-46A would not present new flight safety issues.

The main environmental concern from fuel released from an aircraft is fuel deposition onto the ground and/or surface waters and any possible negative impacts on human health or natural resources. The results of a study on the fate of jettisoned fuel from large DAF aircraft (e.g., KC-135) (Deepti 2003) were used to identify a reasonably conservative ground-level fuel deposition value for the KC-46A. This study used the Fuel Jettison Simulation model developed by the DAF to estimate the ground deposition of fuel from jettison events. The estimated maximum volume of KC-46A-jettisoned fuel that would reach the ground would be well below thresholds for adverse impacts on human health. Because a KC-46A jettison event is less likely than for the KC-135, and because it would not produce measurable impacts on human health (Deepti 2003, Teske and Curbishley 2000).

Bird/Wildlife Aircraft Strike Hazard at MacDill AFB and Vicinity. Long-term, negligible, adverse impacts would be expected from a slight increase in bird/wildlife-aircraft strike hazard associated with the proposed 15 percent increase in operations under Alternative 1. The proposed KC-46A flight operations would be similar to those currently conducted by KC-135 aircraft at MacDill AFB, including all safety actions. The KC-46A flight program would incorporate use of existing DAF bird avoidance technologies and practices to minimize risk and potential for bird/wildlife-aircraft strikes.

Occupational Safety. Short-term, negligible to minor, adverse impacts on occupational safety at MacDill AFB would be anticipated from increased occupational hazards during construction, including those from vehicles, noise/dust, air emissions, construction zones, and detours.

Impacts would be minimized through compliance with all applicable Air Force Occupational Safety and Health (AFOSH) and Occupational Safety and Health Administration (OSHA).

Short-term, minor, adverse impacts would include increased occupational hazards from the presence and operation of construction vehicles and equipment, such as use of diesel-powered vehicles and equipment; air emissions, noise and dust generation; and hazards related to active construction zones such as trips, falls, movement of equipment and materials, and detours on the installation during construction and renovation of facilities; however, these impacts would be temporary. Construction and renovation activities would comply with all applicable OSHA regulations and applicable installation LUCs to protect workers.

The proposed operation of 24 KC-46A PAA on the installation airfield would not create new or unique occupational safety issues. All operational activities would continue to be conducted in accordance with applicable regulations, technical orders, and DAF AFOSH standards.

No increase in risk or frequency of aircraft mishaps on the airfield would be expected under Alternative 1 because the KC-46A would be maintained, taxied, and stored in an airfield environment where an aerial refueling mission already exists. Because the KC-46A is a new airframe and would require response actions specific to the aircraft, emergency and mishap response plans would be updated to include procedures and response actions tailored to the KC-46A and associated equipment. Proposed fueling infrastructure improvements would provide reduction in spill, fire, and contamination risk during daily operation of the KC-46A mission.

Weapons/Public Safety. Proposed construction and renovation would not affect existing CZs or APZs; however, some proposed construction and renovation would occur within ESQD arcs. All applicable procedures and regulations would be followed to avoid potential safety impacts. Additionally, new facilities and infrastructure would be built in compliance with Antiterrorism/Force Protection requirements.

Ground-disturbing activities associated with construction are likely to coincide with soil and groundwater contamination resulting from historic PFOA and PFOS releases. Refer to **Section 3.3.9** for more information on PFAS contamination and mitigation at MacDill AFB.

Emergency Services. Long-term, negligible, adverse impacts on fire and emergency services could occur due to increased demand resulting from the increase in personnel and their dependents under Alternative 1.

3.3.11 Air Quality

For each alternative, the ROI for the air quality analysis includes the installation, surrounding communities, and air quality region potentially affected by the Proposed Action. For aircraft operations, the ROI is a three-dimensional vertical column of air up to 3,000 feet AGL (or the mixing zone, whichever is lower), where pollutant emissions associated with aircraft operations would occur.

3.3.11.1 Affected Environment

The six pollutants that are the main indicators of air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide, nitrogen dioxide, ozone (O_3), suspended particulate matter (measured less than or equal to 10 microns in diameter [PM_{10}] and less than or equal to 2.5 microns in diameter [$PM_{2.5}$]), and lead. CO, sulfur oxides (SO_X), nitrous oxides (NO_X), lead, and some particulates are emitted directly into the atmosphere from emissions sources. NO_X, O_3, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compound and NO_X emissions are precursors of O_3 and are used to represent O_3 generation.

Under the Clean Air Act, the USEPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for these pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health impacts, while secondary standards protect against welfare impacts, such as damage to farm crops, vegetation, and buildings. **Table 3-22** shows the federal primary and secondary air quality standards. USEPA Region 4 and FDEP regulate air quality in Florida. The state accepts the federal NAAQS listed in **Table 3-22**. MacDill AFB is in Hillsborough County, Florida, which is within the West Central Florida Intrastate Air Quality Control Region (40 CFR Part 81.96). USEPA has designated the portion of Hillsborough County containing MacDill AFB as attainment for all criteria pollutants.

Table 3-22. NAAQS

Criteria Pollutant	Primary/ Secondary	Averaging Time	Level	Form
CO	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
NO_X	Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	Annual	53 ppb	Annual mean
O_3	Primary and Secondary	8-hour	0.070 ppm[a]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
	Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
	Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Pb	Primary and Secondary	Rolling 3-month Average	0.15 µg/m^3 [b]	Not to be exceeded
SO_X	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	3-month average not to be exceeded more than once per year

Source: 40 CFR Part 50

[a] Final rule was signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standard of 0.075 ppm remains in effect in some areas.

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

Key: O_3 = ozone; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; Pb = Lead; CO = carbon monoxide; NO_X = nitrous oxide; SO_X = sulfur oxide; ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter

Table 3-23 summarizes the county-level air quality design values for Hillsborough County. These design concentrations are derived from monitoring sites throughout the entire county and are used to indicate compliance with the NAAQS based on 3-year averages, which is the basis for USEPA attainment/nonattainment designations. County-level design concentrations indicate the portion of Hillsborough County containing MacDill AFB is “Clearly Attainment” (i.e., not within 5 percent of exceeding any NAAQS) for all criteria pollutants.

Table 3-23. 2021 Air Quality Design Values for Hillsborough County

Criteria Pollutant	Averaging Period	NAAQS	2021 Design Concentration[a]	Within 5% of Exceeding NAAQS?
CO	8-hour	9 ppm	0.9 ppm	No
	1-hour	35 ppm	1.3 ppm	No
NO_X	1-hour	100 ppb	37 ppb	No
	Annual	53 ppb	9 ppb	No
O_3	8-hour	0.070 ppm	0.066 ppm	No
$PM_{2.5}$	Annual	12 µg/m^3	8.1 µg/m^3	No
	24-hour	35 µg/m^3	18 µg/m^3	No
PM_{10}	24-hour	150 µg/m^3	Not available[b]	Not available[b]
Pb	3-month	0.15 µg/m^3	0.09 µg/m^3	No
SO_X	1-hour	75 ppb	33 ppb	No

Source: USEPA 2022c

[a] The design concentration is the monitored (ranked or percentile based) concentration that is used to assess compliance with the NAAQS.

[b] The 2021 design concentration for PM_{10} was not available.

Key: NAAQS = National Ambient Air Quality Standards; CO = carbon monoxide; NO_X = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; O_3 = ozone; SO_X = sulfur oxides; Pb = lead; ppm = parts per million; µg/m^3 = micrograms per cubic meter; ppb = parts per billion

A portion of Hillsborough County approximately 0.3 mile east of MacDill AFB is designated as maintenance for SO_X, while a portion of the county approximately 8 miles northeast of MacDill AFB is designated as maintenance for lead (FDEP 2018a, 2018b). Aircraft arrivals using Runway 05 approach the runway inside the air mixing zone (i.e., below 3,000 feet) within these two maintenance areas, and approximately 25 percent of radar/Instrument Flight Rules closed pattern operations occur inside the air mixing zone within the SO_X maintenance area. Therefore, the General Conformity Rule is potentially applicable to emissions of SO_X and lead from aircraft operations. As outlined in 40 CFR Part 93.153(b), the applicable *de minimis* level thresholds for these pollutants is 100 tons per year (tpy) for SO_X and 25 tpy for lead. An additional maintenance area for SO_X is within Hillsborough County approximately 22 miles east of MacDill AFB; however, aircraft operations from MacDill AFB do not occur below 3,000 feet in this area (FDEP 2019). Because MacDill AFB is within an area that is in full attainment for the NAAQS, the General Conformity Rule is not applicable to actions that would occur within the boundary of the installation, such as the facility and infrastructure projects.

USEPA monitors levels of criteria pollutants at representative sites throughout the United States. For reference, **Table 3-24** shows the highest reported concentrations by all monitoring stations within Hillsborough County during the last 3 years.

Table 3-24. 2019–2021 Ambient Air Monitoring Data, Hillsborough County, Florida

Air Quality Indicator	2019	2020	2021
O_3			
Peak 8-hour value (ppm)	0.073	0.071	0.079
Days above federal standard (0.070 ppm)	3	2	1
PM_{10}			
Peak 24-hour value (µg/m^3)	81	60	63
Days above federal standard (150 µg/m^3)	0	0	0
$PM_{2.5}$			
Peak 24-hour value (µg/m^3)	24.8	38.4	27.2
Max. 98th Percentile (µg/m^3)	20	18	18
Days above federal standard (35 µg/m^3)	0	1	0
Annual average value (µg/m^3)	8.1	7.9	8.5
Federal annual average primary standard (µg/m^3)	12	12	12
CO			
Peak 1-hour value (ppm)	2.8	1.1	1.2
Days above federal standard (35 ppm)	0	0	0
Peak 8-hour value (ppm)	1.1	1	0.8
Days above federal standard (9 ppm)	0	0	0
NO_X			
Peak 1-hour value (ppb)	48	43	42
Max. 98th Percentile (ppb)	37	35	37
Days above federal standard (100 ppb)	0	0	0
Annual average value (ppb)	9.56	8.71	8.88
Federal annual average standard (ppb)	53	53	53
SO_X			
Peak 1-hour value (ppb)	145.4	52.7	564.5
Max. 99th Percentile (ppb)	27	42	29
Days above federal standard (75 ppb)	0	0	0
Peak 24-hour value (ppb)	10.8	12.9	26.1
Days above federal standard (0.14 ppm = 140 ppb)	0	0	0
Pb			
Peak 3-month average (µg/m^3)	0.09	0.09	0.08
Days above federal standard (0.15 µg/m^3)	3	3	2

Source: USEPA 2022d

Key: O_3 = ozone; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; Pb = lead; ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter

MacDill AFB is considered a minor source for the purposes of air permitting and holds a minor source operating permit (Air Permit Number 0570141-027-AO) issued by the Hillsborough County Environmental Protection Commission. The installation limits its actual annual emissions to levels beneath the major source thresholds (i.e., 100 tpy for each criteria pollutant) by including federally enforceable limitations in its synthetic minor source air operating permit.

These limitations are implemented via specific practices according to fuel type and process. The installation's permit expires June 1, 2023 (MacDill AFB 2021j). Other permit requirements include a periodic inventory of all significant stationary sources of air emissions as well as monitoring and recordkeeping requirements. Primary sources of air emissions are emergency internal combustion engines (i.e., emergency power generators) as well as multiple exempt sources such as natural gas-fired external combustion heating units, fuel storage tanks, parts washers, woodworking activities, painting, and enclosed blasting operations. **Table 3-25** lists MacDill AFB's facility-wide air emissions from all significant stationary sources (MacDill AFB 2021k). **Table 3-25** also includes the most recent available Hillsborough County annual emissions inventory (calendar year [CY] 2017) along with a percentage comparison to Hillsborough County-level emissions (USEPA 2021a). Florida does not require permitting of mobile source emissions (e.g., aircraft and vehicle operations).

Table 3-25. Annual Emissions Inventory for MacDill AFB (CY 2020) and Hillsborough County (CY 2017)

Source Name/Type	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	GHGs[a] (tpy)
MacDill AFB (CY 2020)							
Stationary sources	4.21	4.29	1.588	0.11	0.72	0.58	Not Available
Hillsborough County (CY 2017)							
Stationary sources	5,132	19,243	17,740	7,856	3,255	2,849	10,468,318
Area sources	863	17,670	5,785	32	21,564	3,167	52,474
Mobile sources	18,775	9,590	125,770	353	1,543	892	8,716,335
Total	**24,770**	**46,504**	**149,295**	**8,241**	**26,362**	**6,908**	**19,237,128**
MacDill AFB (CY 2020) Percent of Hillsborough County Total Inventory (CY 2017)	**0.017**	**0.009**	**0.001**	**0.001**	**0.003**	**0.008**	**Not available**

Source: MacDill AFB 2021k, USEPA 2021a

[a] The GHG emissions listed include carbon dioxide, methane, and nitrous oxide.
Key: CY = calendar year; NO_X = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; GHG = greenhouse gas; tpy = tons per year

Climate and Greenhouse Gases. The Tampa area has an average high temperature of 90 degrees Fahrenheit (°F) in the hottest month of August and an average low temperature of 52.4°F in the coldest month of January. The region has an average annual precipitation of 3.73 inches per month. The wettest month of the year is August, with an average rainfall of 7.6 inches (Idcide 2022a).

Ongoing global climate change has contributed to rising seas and retreating shores; increased storm intensity; increased precipitation; decreased crop productivity; disruption of natural ecosystems; and human health effects, including effects in Florida. Cities, roads, ports, and water supplies in Florida are vulnerable to the impacts of storms and sea level rise. High air temperatures can cause adverse health effects such as heat stroke and dehydration, especially in vulnerable populations, which can affect cardiovascular and nervous systems. Warmer air

can also increase the formation of greenhouse gasses (GHGs) such as ground-level O_3, which has a variety of health effects, including aggravation of lung diseases and increased risk of death from heart or lung disease (USEPA 2016a). To estimate global warming potential, all GHGs are expressed relative to a reference gas, carbon dioxide (CO_2), which is assigned a global warming potential equal to one. All GHGs are multiplied by their global warming potential, and the results are added to calculate the total equivalent emissions of CO_2 (CO_2e). The dominant GHG emitted is CO_2, accounting for 79 percent of all GHG emissions as of 2020, the most recent year for which data are available (USEPA 2022e). In 2019, Florida produced 233.6 million metric tons of CO_2 emissions and was ranked the third highest producer of CO_2 in the United States (USEIA 2019a).

3.3.11.2 Environmental Consequences

3.3.11.2.1 Analysis Methodology

The air quality analysis estimates the effects on air quality and climate change that would result from implementation of Alternative 1. Effects to air quality posed by a proposed action are evaluated by comparing the annual net change in emissions for each criteria pollutant against the General Conformity Rule *de minimis* values for nonattainment and maintenance areas, or the DAF emissions insignificance indicators for attainment areas. Per the *Air Force Air Quality EIAP Guide, Volume II – Advanced Assessments*, the DAF applies insignificance indicators to actions occurring in an area that is in attainment or unclassified for the NAAQS to provide an indication of the significance of potential impacts to air quality. The insignificance indicator used by the DAF is the 250 tpy Prevention of Significant Deterioration threshold, as defined by USEPA, and is applied to the emissions for all criteria pollutants besides lead occurring in areas that are “Clearly Attainment” (i.e., not within 5 percent of exceeding any NAAQS). The insignificance indicator for lead is 25 tpy. The insignificance indicators do not denote a significant impact; however, they do provide a threshold to identify actions that have insignificant impacts to air quality. Any action with net emissions below the insignificance indicators for all criteria pollutants is considered so insignificant that the action would not cause or contribute to an exceedance of one or more NAAQS (AFCEC 2020).

Based on compliance with the NAAQS, the General Conformity Rule is potentially applicable to emissions of SO_X and lead from aircraft operations within the MacDill AFB ROI. The applicable *de minimis* level threshold for these pollutants is 100 tpy for SO_X and 25 tpy for lead (40 CFR § 93.153[b]). For emissions of attainment pollutants, the Prevention of Significant Deterioration threshold (i.e., 250 tpy for all criteria pollutants besides lead in “Clearly Attainment” areas) is used as an insignificance indicator to determine air quality significance. The indicator of 25 tpy for lead is the only screening indicator for that criteria pollutant.

The estimation of proposed operational emissions is based on the net change in emissions between existing aircraft operations and projected operations. Emissions were calculated using the Air Force Air Conformity Applicability Model (ACAM), version 5.0.17b, dated June 2019, which considers mobile and stationary sources.

GHG emissions resulting from implementation of Alternative 1 have been quantified to the extent feasible in this EIS. The potential effects of GHG emissions are, by their nature, global and cumulative impacts, as worldwide sources of GHGs contribute to climate change. In an

effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by EOs, the Energy Policy Act of 2005, and the DoD Strategic Sustainability Performance Plan, the DAF also has a sustainability program in place for reducing CO_2e emissions through increases in energy/fuel efficiency and using renewable sources where possible. As a result of these objectives, the DAF takes proactive measures to reduce their overall emissions of GHGs and the resulting effects on climate change.

Analysis of air quality considers direct and indirect impacts, and incorporates the use of management actions and compliance with federal and local regulations and requirements.

3.3.11.2.2 Alternative 1

Based on compliance with the NAAQS, the General Conformity Rule is not applicable to emissions of criteria pollutants from construction activities within the boundary of MacDill AFB. Because aircraft arrivals using Runway 05 approach the runway below the air mixing zone (i.e., below 3,000 feet) within nearby maintenance areas for SO_X and lead, the General Conformity Rule is potentially applicable to emissions of SO_X and lead from aircraft operations. As outlined in 40 CFR Part 93.153(b), the applicable *de minimis* level thresholds for these pollutants is 100 tpy for SO_X and 25 tpy for lead.

Air emissions from construction activities under Alternative 1 would result in short-term, minor, adverse impacts on air quality. Emissions of criteria pollutants and GHGs would be directly produced from operation of heavy construction equipment, heavy duty diesel vehicles hauling demolition debris and construction materials to and from the Project Area, workers commuting daily to and from the Project Area, and ground disturbance. All such emissions would be temporary in nature and produced only when construction activities are occurring.

ACAM was used to estimate the air emissions from Alternative 1. **Table 3-26** provides the estimated total net change in emissions for the ROI. The total net annual emissions from construction are not expected to exceed the insignificance indicator of 250 tpy (25 tpy for lead). Detailed emissions calculations are included in **Appendix B**.

The air pollutant of greatest concern during construction is particulate matter, such as fugitive dust. The quantity of uncontrolled fugitive dust emissions from a site is proportional to the area of land being worked and the level of activity. Fugitive dust air emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. Particulate matter air emissions would also occur during combustion of fuels in vehicles and equipment during construction. Emissions of PM_{10} from construction would be temporary and would cease once construction is completed. Additionally, the estimated emissions in **Table 3-26** do not account for BMPs and environmental control measures, which are likely to reduce uncontrolled particulate matter emissions by approximately 50 percent. Construction contractors would employ BMPs and environmental control measures identified in **Sections 2.5** and **2.6** to the greatest extent practicable.

Table 3-26. Estimated Annual Net Change in Air Emissions Under Alternative 1

Year	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	Pb (tpy)	CO_2e (tpy)
2025 (Construction)	2.350	0.441	3.528	0.008	41.342	0.090	<0.001	789.5
2026 (Construction)	5.924	1.058	8.660	0.018	13.732	0.233	<0.001	1,772.9
2027 (Construction)	5.744	1.018	8.325	0.017	0.228	0.227	<0.001	1,691.6
2028 (Construction and Operation)	39.685	12.297	6.441	1.038	-1.698	-0.601	<0.001	4,456.8
2029 (Operation)	141.510	10.418	0.768	4.101	-7.478	-3.085	<0.001	12,750.5
Insignificance indicator[a]	250	250	250	250	250	250	25	None
Exceeds insignificance indicator?	No	No	No	No	No	No	No	N/A

[a] MacDill AFB is within an area that is "Clearly Attainment" for all criteria pollutants. Therefore, the Prevention of Significant Deterioration threshold (i.e., insignificance indicator) of 250 tpy (25 tpy for lead) was applied to emissions from construction and operations within the boundary of MacDill AFB.
Key: NO_X = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; Pb = lead; CO_2e = carbon dioxide equivalent; tpy = tons per year; N/A = not applicable

Long-term, moderate, adverse, and minor, beneficial impacts on air quality would occur from Alternative 1. Air emissions would be directly produced from operation, heating, and cooling of new facilities, KC-46A aircraft operations, and additional personnel at MacDill AFB. Long-term operational air emissions from Alternative 1 would begin in October 2028 and continue indefinitely. The annual operational air emissions were estimated using ACAM and are summarized in **Table 3-26**. The General Conformity Rule is not applicable to emissions of criteria pollutants from operations within the boundary of MacDill AFB, based on compliance with the NAAQS. **Table 3-26** shows the annual net change of operational emissions starting in 2029 would not exceed the insignificance indicator of 250 tpy (25 tpy for lead). Therefore, air quality impacts from long-term operations would not be significant. **Table 3-26** shows Alternative 1 would result in an annual net decrease of PM_{10} and $PM_{2.5}$ emissions, resulting in long-term minor, beneficial impacts on air quality for these pollutants.

The pollutant of greatest concern during long-term operations is NO_X. Projected emissions of NO_X resulting from Alternative 1 were compared to the most recent comprehensive emissions inventory for Hillsborough County (i.e., CY 2017) to determine the relative magnitude of these emissions, and their potential to contribute to an exceedance of the NAAQS for NO_X. The estimated increase of NO_X emissions from operations under Alternative 1 would comprise approximately 0.57 percent of the total NO_X emissions generated by Hillsborough County in 2017 (141.51/24,770 x 100 = 0.57 percent). The majority of operational NO_X emissions from Alternative 1 would result from aircraft operations to an altitude of 3,000 feet AGL and across several square miles that comprise the MacDill AFB airspace and associated flight routes. At or higher than this altitude, the projected NO_X emissions would be adequately dispersed through the atmosphere to the point they would not result in substantial ground-level impacts on a localized area. The portion of Hillsborough County containing MacDill AFB is considered "Clearly Attainment" for all criteria pollutants, meaning the area is not within 5 percent of

exceeding any NAAQS. Because Alternative 1 would increase the county's NO_X emissions by less than 0.5 percent and this NO_X increase of 141.51 tpy is less than the 250 tpy insignificance indicator per the *Air Force Air Quality EIAP Guide, Volume II – Advanced Assessments*, the operational NO_X emissions from Alternative 1 would not be substantial enough to contribute to an exceedance of the NO_X NAAQS.

Air emissions from stationary sources (i.e., heating and cooling systems) at new facilities would not increase the installation's potential to emit above major source thresholds. Therefore, Alternative 1 would not result in a change of the air permitting classification for MacDill AFB to major source status. If required, new minor sources of air emissions would be added to the installation's minor source operating permit.

As noted above, the General Conformity Rule is potentially applicable to emissions of SO_X and lead from aircraft operations because aircraft arrivals using Runway 05 approach the runway below the air mixing zone (i.e., below 3,000 feet) within nearby maintenance areas for SO_X and lead. As such, the applicable *de minimis* level thresholds for these pollutants is 100 tpy for SO_X and 25 tpy for lead. **Table 3-27** provides the estimated total net change in emissions from Alternative 1 for aircraft operations only. Air emissions from aircraft operations would not exceed the *de minimis* level thresholds for SO_X and lead; therefore, a General Conformity Rule conformity analysis is not applicable.

Table 3-27. Estimated Net Change in Air Emissions from Aircraft Operations under Alternative 1

	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	Pb (tpy)	CO_2e (tpy)
Beddown 24 KC-46A	175.176	10.238	42.206	9.811	0.596	0.506	<0.001	29,166.4
Remove 24 KC-135	-34.355	-0.360	-47.672	-5.716	-8.104	-3.620	<0.001	-17,275.3
Net Change	140.821	9.879	-5.466	4.096	-7.507	-3.114	<0.001	11,891.1
de minimis threshold	N/A	N/A	N/A	100	N/A	N/A	25	N/A
Exceeds *de minimis* threshold?	N/A	N/A	N/A	No	N/A	N/A	No	N/A

[a] Aircraft operations below 3,000 feet occur within SO_X and lead maintenance areas. Therefore, the General Conformity Rule is potentially applicable to emissions of SO_X and lead. The *de minimis* level threshold for these pollutants is 100 tpy for SO_X and 25 tpy for lead. *De minimis* level thresholds do not apply to emissions of other criteria pollutants.

Key: NO_X = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; Pb = lead; CO_2e = carbon dioxide equivalent; tpy = tons per year; N/A = not applicable

Climate and Greenhouse Gases. Consistent with EO 14008, this EIS examines GHGs as a category of air emissions. It also examines potential future climate scenarios to determine whether elements of Alternative 1 would be affected by climate change. This EIS does not attempt to measure the actual incremental impacts of GHG emissions from Alternative 1, as there is a lack of consensus on how to measure such impacts. Construction under Alternative 1

would produce a yearly maximum of approximately 1,772.9 tons (1,608 metric tons) of direct CO_2e. By comparison, 1,608 metric tons of CO_2e is approximately the GHG footprint of 346 passenger vehicles driven for 1 year or 313 homes' energy use for 1 year (USEPA 2022f). In 2017, Hillsborough County produced 19,237,128 tons of CO_2e emissions. Emissions from construction during the highest CO_2e emission year under Alternative 1 would represent less than 0.01 percent of the total CO_2e emissions from the county. Operation under Alternative 1 would result in a net increase in CO_2e emissions of 12,750.5 tpy, which is equivalent to the GHG footprint of 2,492 passenger vehicles driven for 1 year or 1,457 homes' energy use for 1 year (USEPA 2022f). The net increase of yearly CO_2e emissions would increase the total yearly CO_2e emissions produced by the county by approximately 0.7 percent, resulting in long-term, negligible, adverse impacts. As such, air emissions produced during construction and operation of the new facilities would not meaningfully contribute to the potential effects of global climate change and would not increase the total CO_2e emissions produced by Hillsborough County.

Ongoing changes to climate patterns in Florida are described in **Section 3.3.11.1**. These climate changes are unlikely to affect the DAF's ability to implement Alternative 1. **Table 3-28** outlines potential climate stressors and their effects on Alternative 1. All elements of Alternative 1 in-and-of-themselves are only indirectly dependent on any of the elements associated with future climate scenarios (e.g., meteorological changes). At this time, no future climate scenario nor potential climate stressor would have appreciable effects on any element of Alternative 1.

Table 3-28. Effects of Potential Climate Stressors on Alternative 1

Potential Climate Stressor	Effects on Alternative 1
Rising seas and retreating shores	Minor
Increased storm intensity	Minor
Increased precipitation	Negligible
Decreased crop productivity	Negligible
Disruption of natural ecosystems	Negligible
Human health effects	Negligible

Source: USEPA 2016a

3.3.12 Environmental Justice and Other Sensitive Receptors

Consideration of concerns related to environmental justice and other sensitive receptors includes the race, ethnicity, poverty status, and age of populations near a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the populations targeted for protection.

As defined by CEQ, minority or low-income environmental justice communities should be identified if the percentage of persons characterized as being a minority or low-income populations within the ROI is either greater than 50 percent or is meaningfully greater than the community of comparison. In this EIS, the analysis uses a conservative interpretation of "meaningfully greater than" to include any minority or low-income population that is greater than that of the community of comparison to any extent. CEQ also states, "A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds"

(CEQ 1997). The community of comparison is the smallest jurisdiction for which U.S. Census Bureau data encompass the footprint of impacts for each resource and is used to establish appropriate thresholds for the impacts analysis (DAF 2014c). Environmental justice communities present within the ROI were determined using these thresholds. Further, for purposes of this EIS, minority, low-income, child, and elderly populations are defined as follows:

- *Minority Population:* Minority populations are defined as members of the following population groups: Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, multi-race that includes one of the aforementioned races; and Hispanic or Latino (CEQ 1997, DAF 2014c). The U.S. Census Bureau considers race and Hispanic or Latino origin (ethnicity) as two separate concepts, and these data are recorded separately.
- *Low-income Population:* Low-income populations are defined as individuals whose income is below the federal poverty threshold based on income data collected in the 2016–2020 American Community Survey (USCB 2020a). In 2020, the federal poverty threshold for an individual was $13,171 (USCB 2020b).
- *Child Population:* Children are defined as all people 17 years of age and under.
- *Elderly Population:* Elderly persons are defined as all people 65 years of age and over.

For analysis of environmental justice and other sensitive receptors, emphasis is placed on areas within the surrounding community that would fall within the noise contours associated with Alternative 1. Because the proposed construction, demolition, and renovation would occur within installation boundaries, the proposed activity most likely to affect off-installation populations would be KC-46A operations. Therefore, the environmental justice and other sensitive receptor analysis evaluates the effect of noise on minority, low-income, child, and elderly populations by identifying populations (down to the census tract level) within the 65-dBA DNL noise contour under baseline conditions and Alternative 1, or by identifying those populations closest to the runway that would experience aircraft operations noise. The ROI for the analysis of effects on environmental justice communities under each alternative includes the installation and off-installation areas underlying the 65-dBA DNL noise contour or in the general path of the runway, and the analysis focuses on minority, low-income, child, and elderly populations that would be exposed to such noise levels during KC-46A operations.

3.3.12.1 Affected Environment

The environmental justice and sensitive receptors ROI for Alternative 1 at MacDill AFB consists of census tracts 69, 70.02, and 72 (see **Figure 3-9**). No portions of MacDill AFB were included in the ROI because the installation land within the proposed 65-dBA DNL noise contour consists of land uses that are functionally related to the airfield (e.g., airfield, aircraft operations and maintenance, open space [undeveloped buffer space], industrial), and generally off limits to all non-military and non-DoD civilian personnel. Additionally, no other on-installation areas are within the proposed 65-dBA DNL noise contour where environmental justice and sensitive receptor populations might congregate, such as schools, churches, parks, or residential areas. The community of comparison is Hillsborough County, and data for Florida is provided as an additional area of comparison.

Data Source: Bing Maps Aerial

Figure 3-9. Environmental Justice and Sensitive Receptors ROI for Alternative 1

Table 3-29 presents characteristics of the minority and low-income environmental justice populations, and elderly and child sensitive receptor populations within the ROI census tracts as compared with the populations of Hillsborough County and the State of Florida. In 2020, the minority population for tract 70.02 was greater than the percentage minority populations of Hillsborough County and the State of Florida and was, therefore, considered a minority environmental justice community (USCB 2020a).

Table 3-29. Minority, Low-Income, Child, and Elderly Populations in the MacDill AFB Vicinity

Geographic Area	Total Population	Percent Minority	Percent Low-Income	Percent Elderly	Percent Children
Census Tract					
69	6,118	25.7	5.2	9.3	24.8[b]
70.02	3,170	64.8[a]	24.0[a]	4.9	23.6[b]
72	4,549	29.8	5.2	8.5	21.1
Community of Comparison					
Hillsborough County	1,451,358	52.1	14.0	14.3	22.3
Florida	21,216,924	46.6	13.3	20.5	19.9

Source: USCB 2020a
[a] Indicates the percentage of the population is meaningfully greater than the percentage of the reference population of the community of comparison, and is therefore considered an environmental justice community.
[b] Indicates the percentage of the population is meaningfully greater than the percentage of the reference population of the community of comparison, and is therefore considered a sensitive receptor community.

The percentage of low-income persons within tract 70.02 was meaningfully greater than, and nearly double, both the county and state reference populations and was, therefore, determined to be a low-income environmental justice community (USCB 2020a). The percentage minority and low-income persons within census tracts 69 and 72 were lower than those populations in the communities of comparison and, therefore, were not determined to be environmental justice communities (see **Table 3-29**) (USCB 2020a).

3.3.12.2 Environmental Consequences

3.3.12.2.1 Analysis Methodology

Analysis of environmental justice and other sensitive receptors is conducted pursuant to EOs 12898 and 13045. Alternative 1 was assessed to determine if disproportionately high and adverse human health and environmental impacts on environmental justice populations (i.e., minority or low-income populations greater than 50 percent of the total population or meaningfully greater than that of the community of comparison) or sensitive receptors (i.e., youth or elderly populations) within the environmental justice ROI.

Impacts would be considered significant if they disproportionately affect environmental justice populations or sensitive receptors compared to the general population. Significant impacts on environmental justice populations and sensitive receptors could include a substantial increase in noise levels and air emissions during construction and from increased aircraft operations.

For all child and elderly populations, disproportionate impacts are inherent. The extent to which child and elderly populations would be impacted is disproportionate due to their inherent vulnerabilities from age-related physiological differences in types and levels of exposure. Therefore, the evaluation of environmental impacts on these populations is different from the evaluation of environmental impacts on adults and other populations.

3.3.12.2.2 Alternative 1

Short-term, negligible, adverse impacts on environmental justice or sensitive receptor populations could occur from increased noise and actions associated with construction, demolition, and renovation. Proposed construction and renovation would occur within discrete areas of MacDill AFB in land uses that are functionally related to the airfield, where access is generally restricted to military and DoD civilian personnel. Standard construction safety BMPs (e.g., fencing and other security measures) would reduce potential risks to on-installation populations to minimal levels. Temporary increases in air emissions, noise, and traffic associated with construction and renovation may impact surrounding areas and populations. Therefore, short-term, negligible, adverse impacts on environmental justice or sensitive receptor populations could occur as a result of construction and renovation associated with Alternative 1. These impacts however would be distributed evenly across the surrounding area and would not be disproportionate on any populations, including minority and low-income populations; nor would exposure of children and elderly persons to environmental health risks or safety risks be increased.

Populations in the ROI currently experience noise under the KC-135 mission at MacDill AFB and would continue to experience noise under Alternative 1. Despite the anticipated 15 percent increase in aircraft operations, the land area within the noise contours would decrease following the replacement of the KC-135s by the KC-46As. This decrease in land area affected by the 65 dBA would occur because the KC-46A is generally quieter than the KC-135. Aircraft noise from KC-46A operations would continue to cause adverse impacts on populations within the ROI from the 60- and 65-dBA DNLs that would overlap portions of all three tracts, and the small portion of tract 72 within the 70-dBA DNL. A decrease, however, of approximately 0.4 acre of the 65-dBA DNL coverage and approximately 0.3 acre of 60-dBA DNL coverage of tract 72 would occur. An approximately 0.2 acre increase of 70-dBA DNL coverage of tract 72 would occur, but as shown in **Figure 3-9**, that coverage is adjacent to the installation and does not cover any residential areas. A decrease of approximately 15 acres of 65-dBA DNL coverage and 56 acres of 60-dBA DNL coverage of tract 69 would occur, which would diminish the area of parks and residential area impacted by that noise level from aircraft operations at MacDill AFB. Over tract 70.02, an approximately 0.1 acre decrease in 65-dBA DNL coverage and approximately 4 acres decrease in 60-dBA DNL coverage would occur. Additionally, as shown in **Table 3-1**, areas under less than a 65-dBA DNL are generally acceptable for noise-sensitive land uses. Therefore, long-term, negligible, beneficial impacts would be expected.

Changes in noise contours at MacDill AFB would constitute a long-term, negligible, beneficial impact from a decrease in off-installation area impacted by higher levels of aircraft noise. Although the total acreage of off-installation areas impacted by the 65-dBA DNL contour would decrease, areas of three parks and residential areas would continue to be impacted by aircraft operations noise. No schools, childcare centers, hospitals, retirement communities, or other

areas where sensitive receptors might congregate occur within the proposed 65-dBA DNL contour near MacDill AFB. No disproportionate impact on environmental justice or children and elderly populations would be expected.

3.4 Alternative 2 – Fairchild AFB

This section describes the affected environment and anticipated environmental consequences of Alternative 2, the KC-46A MOB 6 beddown at Fairchild AFB and, when applicable, in areas surrounding the installation. The baseline resource conditions are described to the level of detail necessary to support analysis of the potential impacts that could result from the MOB 6 beddown at Fairchild AFB.

3.4.1 Noise

The ROI for the noise analysis is defined in **Section 3.3.1**.

3.4.1.1 Affected Environment

Aircraft Noise. The DAF uses results from the NOISEMAP computer programs to describe noise from aircraft operations. NOISEMAP is a suite of computer programs and components developed by the DoD to predict noise exposure near an airfield due to aircraft flight, maintenance, and ground run-up operations. These programs account for all aircraft activities, including landings, takeoffs, in-flight operations, maintenance activities, and engine run-ups. NOISEMAP Version 7.3 was used to calculate the existing DNL contours at Fairchild AFB based on the 2021 operational conditions at the installation. The noise study developed for this EIS analysis provides an overview of the methods used to develop aircraft noise contours and is available on the project website**.**

Figure 3-10 shows the baseline DNL contours at Fairchild AFB plotted in 5 dB increments, ranging from 65- to 85-dBA DNL. The baseline 65-dBA DNL noise contour extends approximately 528 feet from both ends of the runway and remains within the installation boundary.

No substantial changes in operations or mission at the installation have occurred since these noise contours were developed; therefore, they have been carried forward as a comparative baseline to determine the level of impacts under NEPA.

As noted in **Section 3.3.1.2.1**, these noise levels, which are often shown graphically as contours on maps, are not discrete lines that sharply divide louder areas from land largely unaffected by noise. Instead, they are part of a planning tool that depicts the general noise environment around the installation based on typical aviation activities. Areas with DNL less than 65 dBA can also experience levels of appreciable noise depending upon training intensity or weather conditions. Additionally, DNL contours may vary from year to year due to fluctuations in operational tempo from unit deployments, funding levels, and other factors.

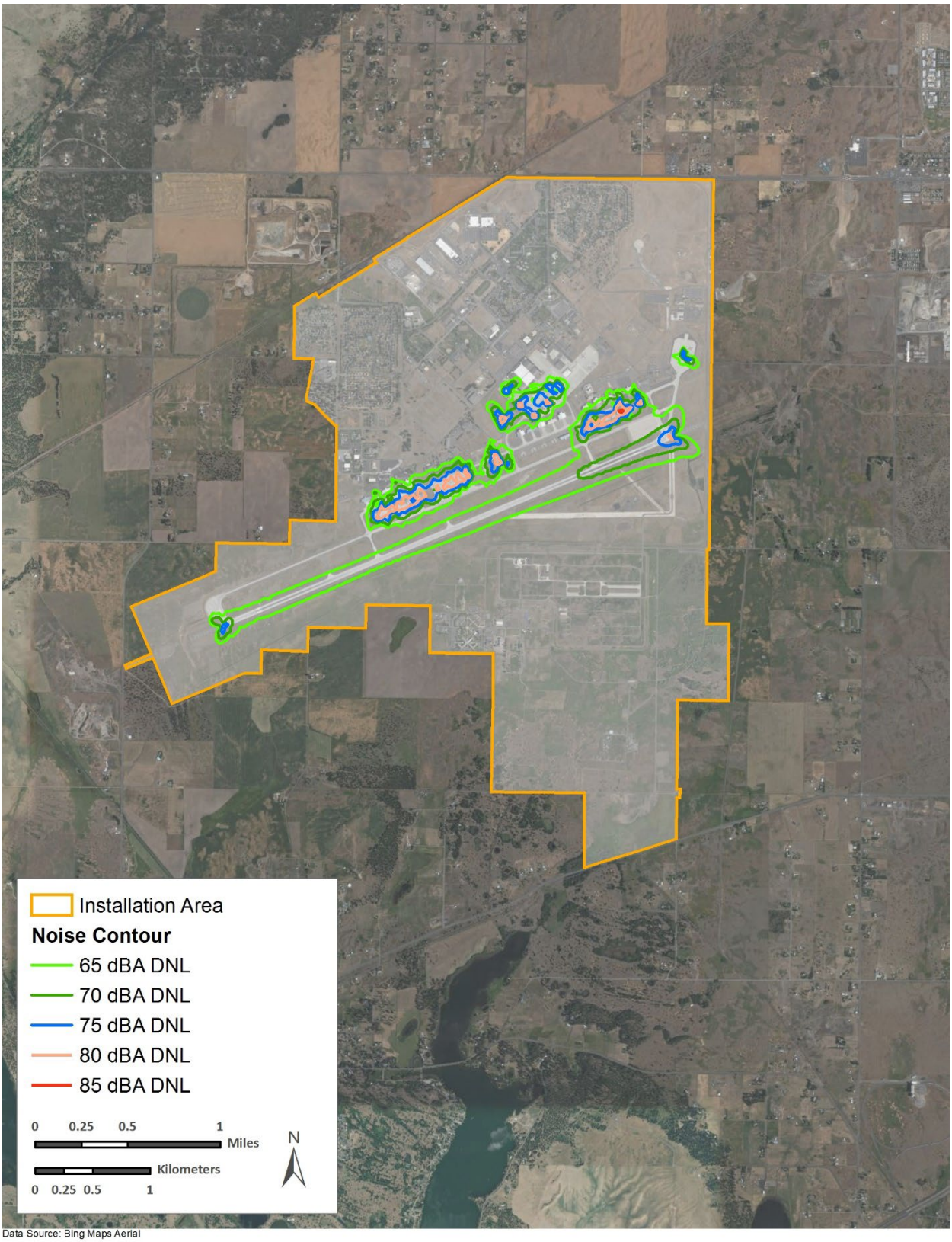


Figure 3-10. Baseline Noise Contours for Fairchild AFB

Table 3-30 presents the existing land acreage exposed to DNL greater than or equal to 65 dBA. Areas exposed to DNL greater than 65 dBA are within the installation boundary. No schools, churches, or hospitals are within or exposed to DNL greater than or equal to 65 dBA.

Table 3-30. Acreage within the Baseline Noise Contours at Fairchild AFB

Noise Contour (dBA DNL)	Area Under Contours (Acres)		
	On-Installation	Off-Installation	Total
65–69	432	0	**432**
70–74	152	0	**152**
75–79	61	0	**61**
80–84	18	0	**18**
≥ 85	>1	0	**>1**

Noise Abatement Procedures. Aircraft noise abatement procedures at Fairchild AFB have been designed to minimize effects on the surrounding community while maximizing operational capacity and flexibility. The installation's aircraft noise abatement procedures restrict overflights over Eastern Washington State Hospital, Sunset Elementary School, and housing areas on-installation. Overflights are not permitted below 1,000 feet AGL over Airway Heights Correctional Facility. Overflights over the City of Spokane are not permitted below 5,000 feet MSL for fixed-wing aircraft or below 500 feet AGL for helicopters. Noise complaints in the community around Fairchild AFB are relatively infrequent. Complaints range from general noise to low-flying aircraft and noise from exploding ordnance. The explosive ordnance disposal training area is near a residential area near the southern side of the installation, resulting in impacts from munitions noise (DAF 2018a).

3.4.1.2 Environmental Consequences

3.4.1.2.1 Analysis Methodology

The analysis methodology used to assess noise impacts from Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.1.2.1**.

3.4.1.2.2 Alternative 2

Short-term, minor, adverse impacts on the noise environment would be expected under Alternative 2 due to noise generated by heavy equipment during construction. Long-term, minor, adverse impacts on the noise environment would be expected under Alternative 2 from increased annual aircraft operations.

Facility Construction and Modification. Construction and demolition would require use of heavy equipment that would generate short-term increases in noise near the project sites. **Table 3-4** presents typical noise levels (dBA at 50 feet) for the main phases of outdoor construction. As discussed in **Section 3.3.1**, individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (USEPA 1971, FHWA 2006). With multiple items of equipment operating concurrently, noise levels can be relatively high within several hundred feet of active construction and demolition sites.

All construction, demolition, and renovation activities under Alternative 2 would occur within the installation's boundary, be collocated with other existing noise-compatible activities, and end

with the facility construction and modification phase. These activities would be conducted in the context of an active AFB where aircraft and other types of noise are typical. Some people living or working near the sites may notice or be annoyed by the noise. Given the temporary nature of proposed construction, demolition, and renovation; distance to nearby noise sensitive areas; and the existing noise environment, these impacts would be minor. To further reduce noise impacts, the avoidance and minimization measures and best practices identified in **Sections 2.5**, **2.6**, and **3.3.1.2.2**. would be implemented.

Aircraft Operations. **Figure 3-11** shows the baseline and projected DNL contours for Alternative 2 at Fairchild AFB plotted in 5 dB increments ranging from 65- to 85-dBA DNL. The proposed 65-dBA DNL contour would extend approximately 528 feet from both ends of the installation's runway, remaining within the installation boundary.

Table 3-31 presents the land acreage that would be exposed to DNL greater than or equal to 65-dBA DNL for Alternative 2. No acres would be off-installation and approximately 579 acres would be on-installation within the 65-dBA DNL contour under Alternative 2, an increase of approximately 147 acres from the baseline acreage. No schools, churches, nor hospitals would be exposed to DNL greater than or equal to 65 dBA. Because the change in noise contours would be largely limited to areas designated for airfield operations, long-term, minor, adverse impacts on the noise environment would be expected under Alternative 2. For further discussion of land use compatibility within the proposed DNL contours, see **Section 3.4.8**.

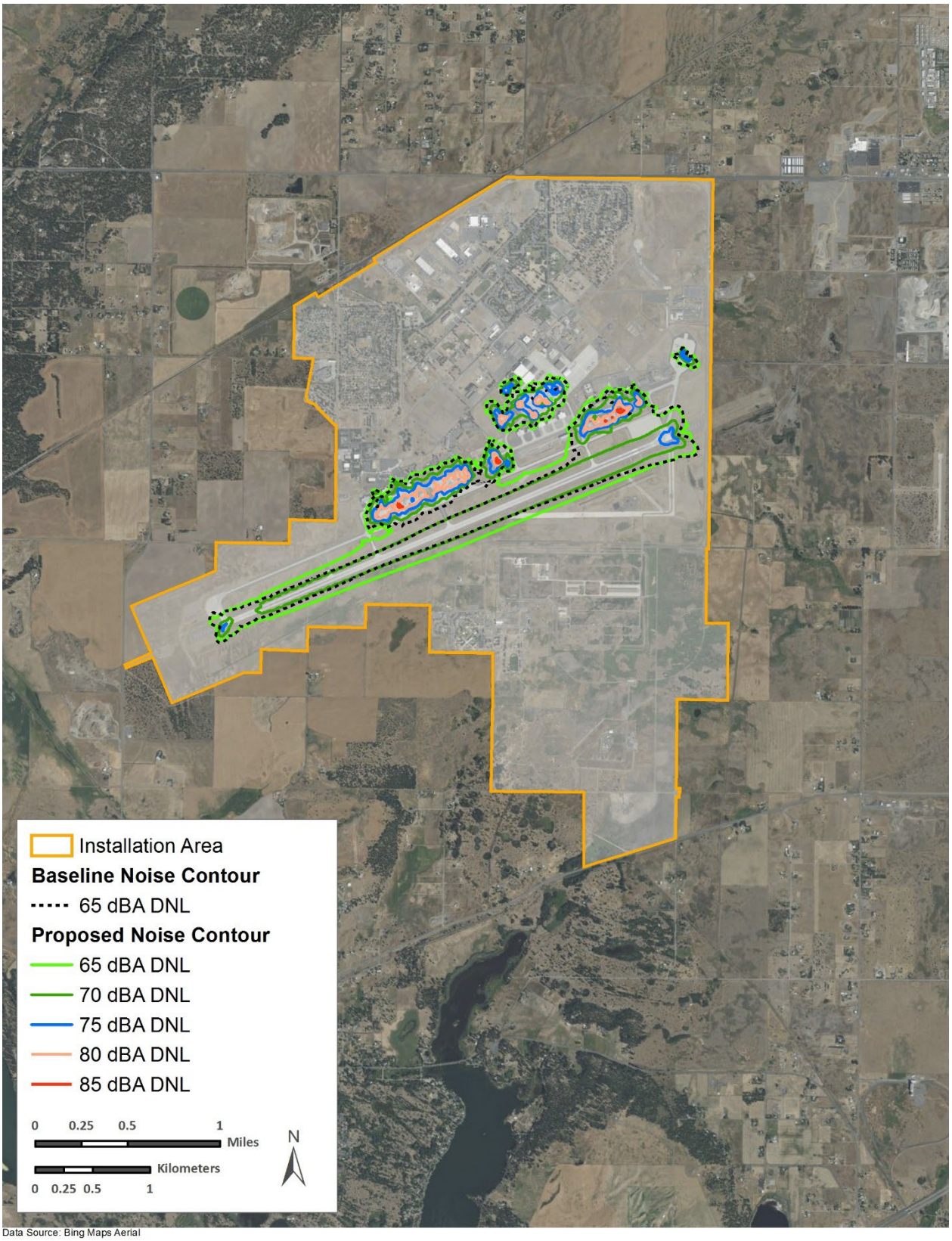
Table 3-31. Acreage within the Proposed Noise Contours at Fairchild AFB

Noise Contour (dBA DNL)	Area Under Contours (Acres)		
	On-Installation	**Off-Installation**	**Total**
65–69	579	0	**579**
70–74	290	0	**290**
75–79	68	0	**68**
80–84	24	0	**24**
≥ 85	1	0	**1**

Key: dBA DNL = day-night average sound level measured in "A"-weighted decibels

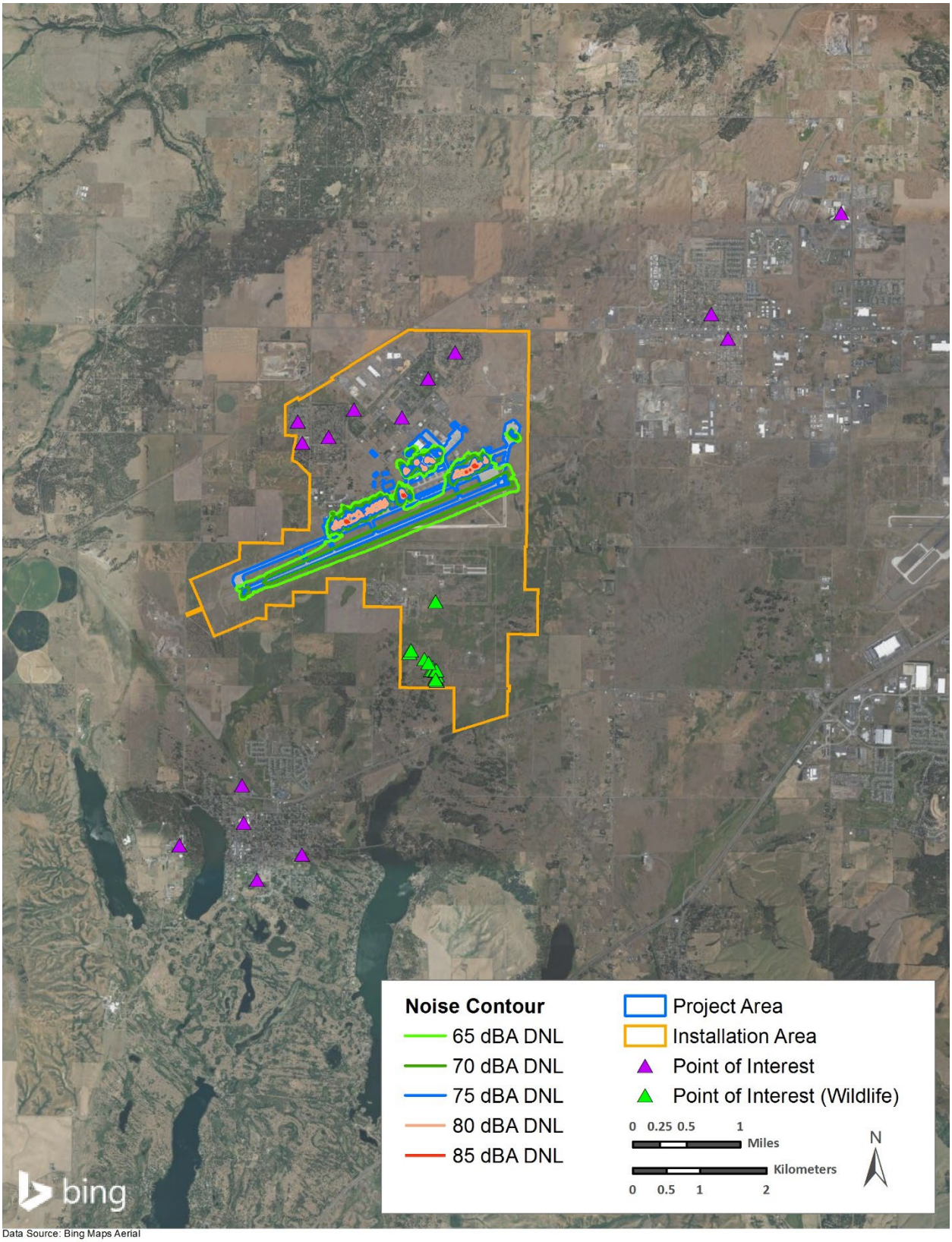
Alternative Metrics. The alternative metrics required analyses of noise exposure relating to potential effects of noise, including sleep disturbance, hearing loss, classroom learning interference, and speech interference. These metrics also addressed an analysis of noise effects on wildlife. These analyses focus on specific POIs in the vicinity of Fairchild AFB and are shown in **Figure 3-12**. These POIs were provided by DAF and include:

- Four on-base residential receptors (POIs R01 through R04)
- Two on-base schools (S01 and S02)
- Seven off-base schools (S03 through S09)
- One on-base and one off-base hospital (H01 and H02)
    - Fifteen wildlife locations: One raptor nest (W01); Fourteen Spalding's Catchfly monitoring locations (W02 through W15)



Data Source: Bing Maps Aerial

Figure 3-11. Noise Contours for Proposed KC-46A Operations at Fairchild AFB



Data Source: Bing Maps Aerial

Figure 3-12. POIs at Fairchild AFB

The raptor nest (W01) and Spalding's Catchfly location W15 are located at the same coordinates but at different altitudes. The raptor nest was modeled at 50 feet AGL and all Spalding's Catchfly locations were modeled on the ground, i.e., at 0 feet AGL. All other POI were modeled at 5 feet AGL.

Figure 3-13 shows a large-scale map over Medical Lake and depicts locations of the off-base hospital (H02) and several of the off-base schools (S03, S04, S05, and S09). **Figure 3-14** shows a large-scale map over Airway Heights and depicts the locations of several of the off-base schools (S06, S07, and S08). **Figure 3-15** shows POIs on the northern part of the base, including the on-base hospital (H01), the on-base schools (S01 and S02), and the residential sites.

Potential for Sleep Disturbance. For the sleep disturbance analysis, the residential and hospital POIs were used, and only nighttime operations were considered.

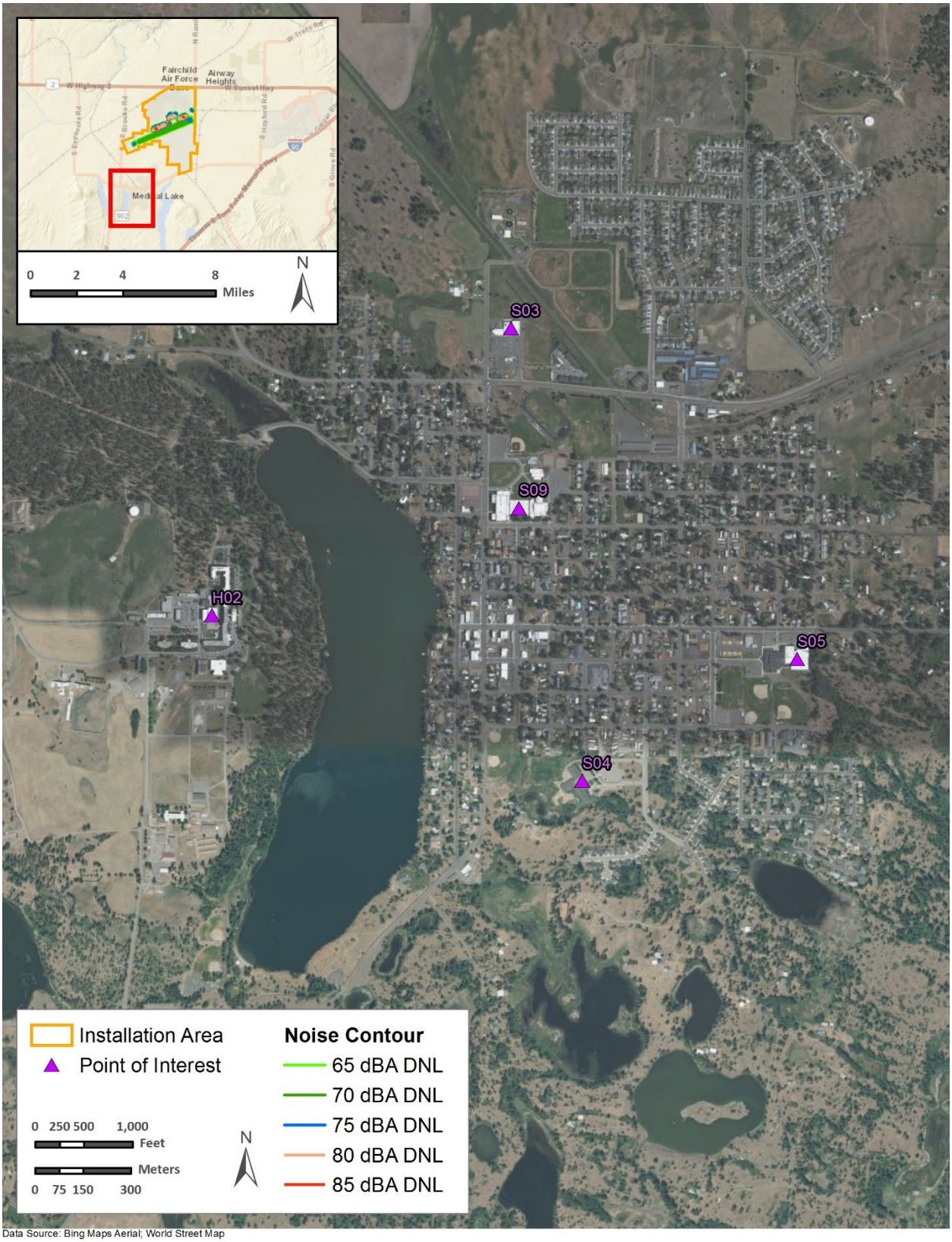
As shown in **Table 3-32**, at three of the four on-base residential POIs, the NA 90 SEL would not change relative to the No Action or baseline scenarios. Under this Alternative, R04 and H01 could potentially experience eight sleep disturbing events per year due to the KC-46A spiral closed patterns.

Table 3-32. Annual Number of Nighttime Events at or Above 90 dBA SEL

POI	ID	Baseline Annual Events	Alternative 2 Annual Events	Resulting Change in Annual Number of Events (+/-)
On-base Family Housing Centerpoint A	R01	0	0	0
On-base Family Housing Centerpoint B	R02	0	0	0
On-base Family Housing Centerpoint C	R03	0	0	0
On-base Family Housing Centerpoint D	R04	0	8	8
Fairchild AFB Hospital	H01	0	8	8
Eastern State Hospital	H02	0	0	0

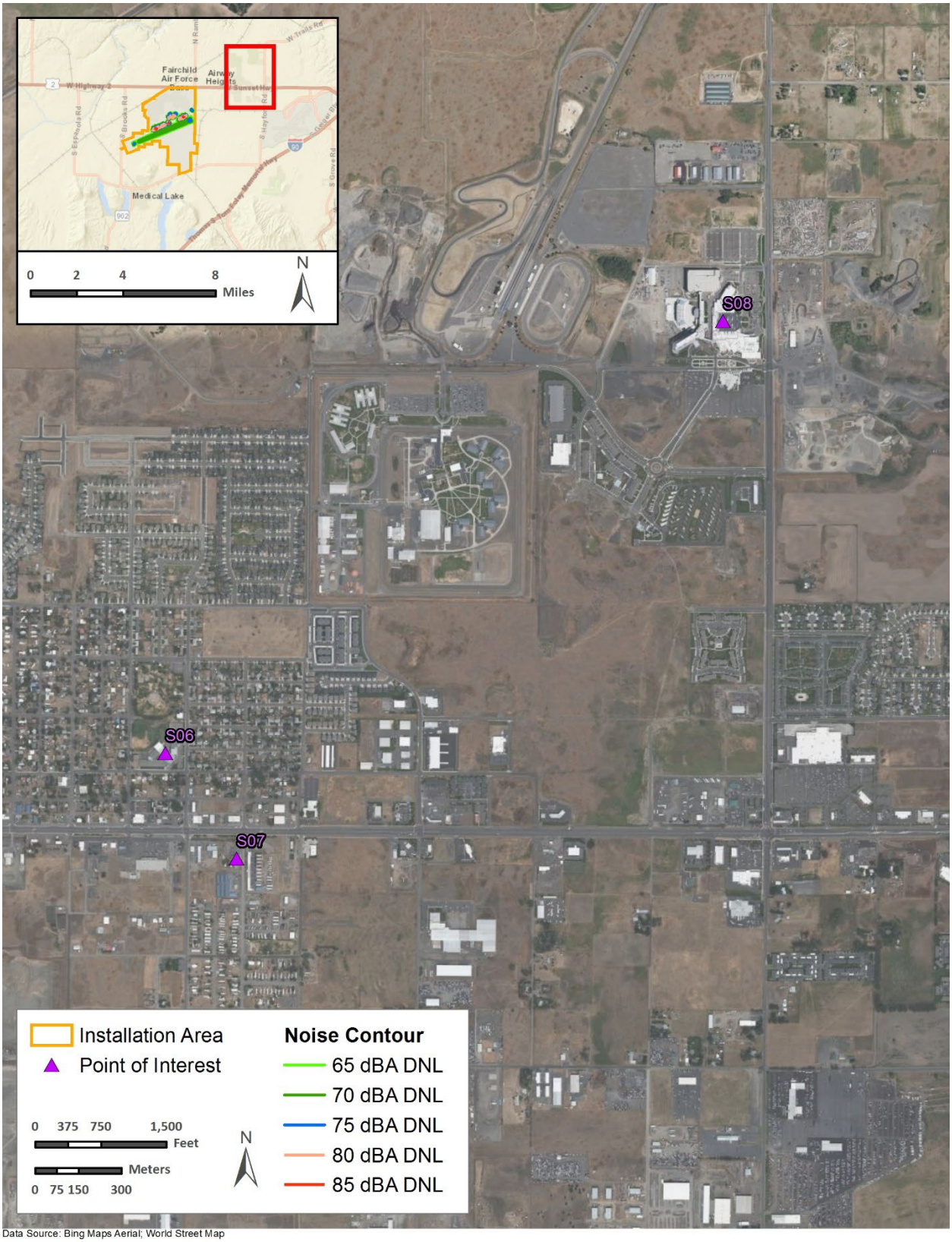
Source: HMMH 2022

Classroom Learning Interference. The classroom learning interference analysis assumed school day hours of 8 a.m. to 4 p.m., entirely within the DNL daytime period.



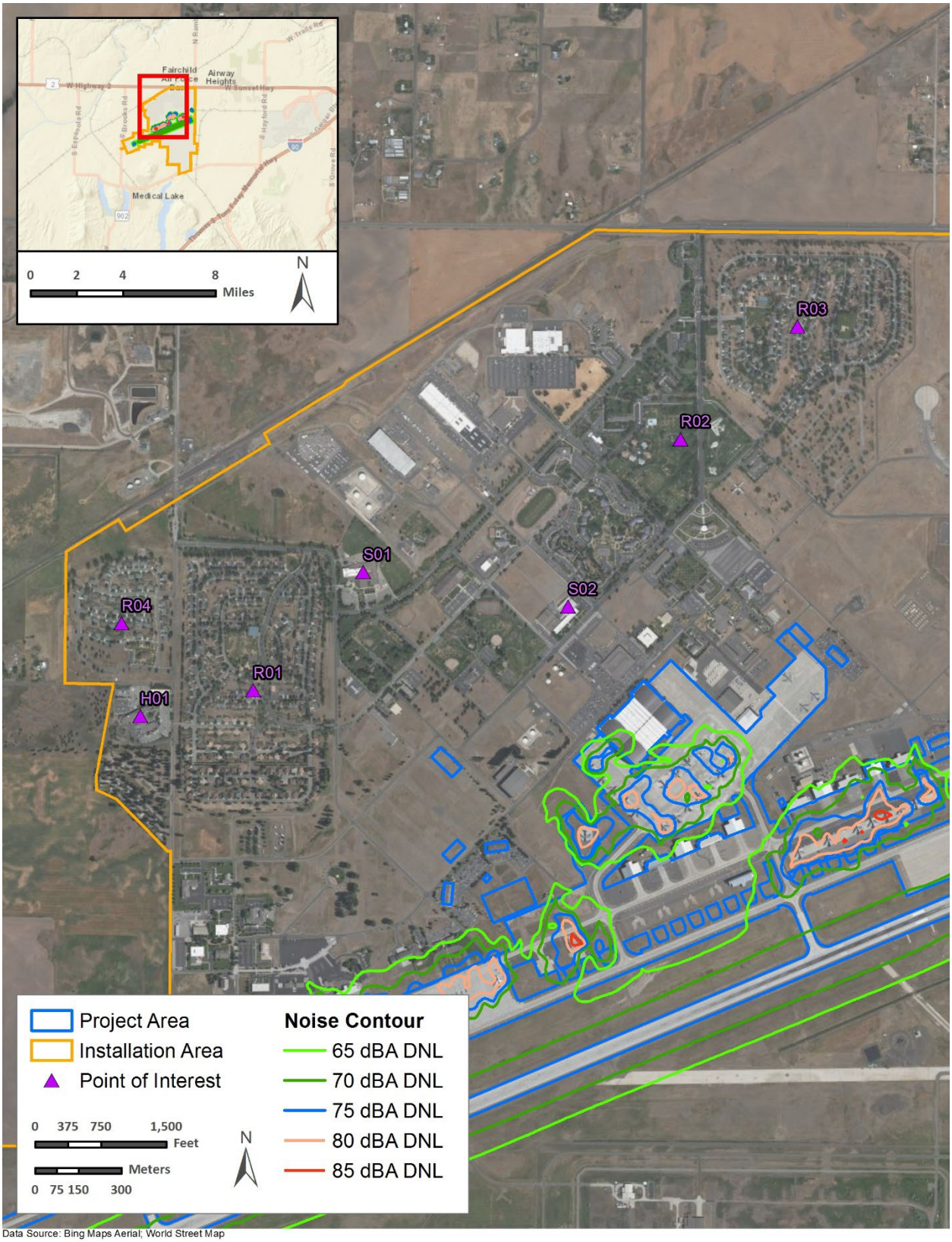
Data Source: Bing Maps Aerial; World Street Map

Figure 3-13. Off-Base POIs at Fairchild AFB – Southwest



Data Source: Bing Maps Aerial; World Street Map

Figure 3-14. Off-Base POIs at Fairchild AFB - Northeast



Data Source: Bing Maps Aerial; World Street Map

Figure 3-15. On-Base POIs at Fairchild AFB

As shown in **Table 3-33**, none of the schools would have an $L_{eq(8h)}$ greater than or equal to 60 dBA in either the baseline or Alternative 2 scenarios, so NA and TA metrics are not needed, and classroom learning interference would not be expected.

Table 3-33. School Day $L_{eq(8h)}$

POI	ID	Baseline	Alternative 2
Michael Anderson Elementary School	S01	43	48
Blair Elementary School	S02	46	48
Medical Lake High School	S03	33	34
Hallet Elementary School	S04	30	31
Medical Lake Middle School	S05	31	32
Sunset Elementary School	S06	42	44
Little Sunshine Learning Center	S07	44	45
Kids Quest at Northern Quest Resort	S08	38	38
Cela's Creative Learning Academy	S09	32	33

Source: HMMH 2022

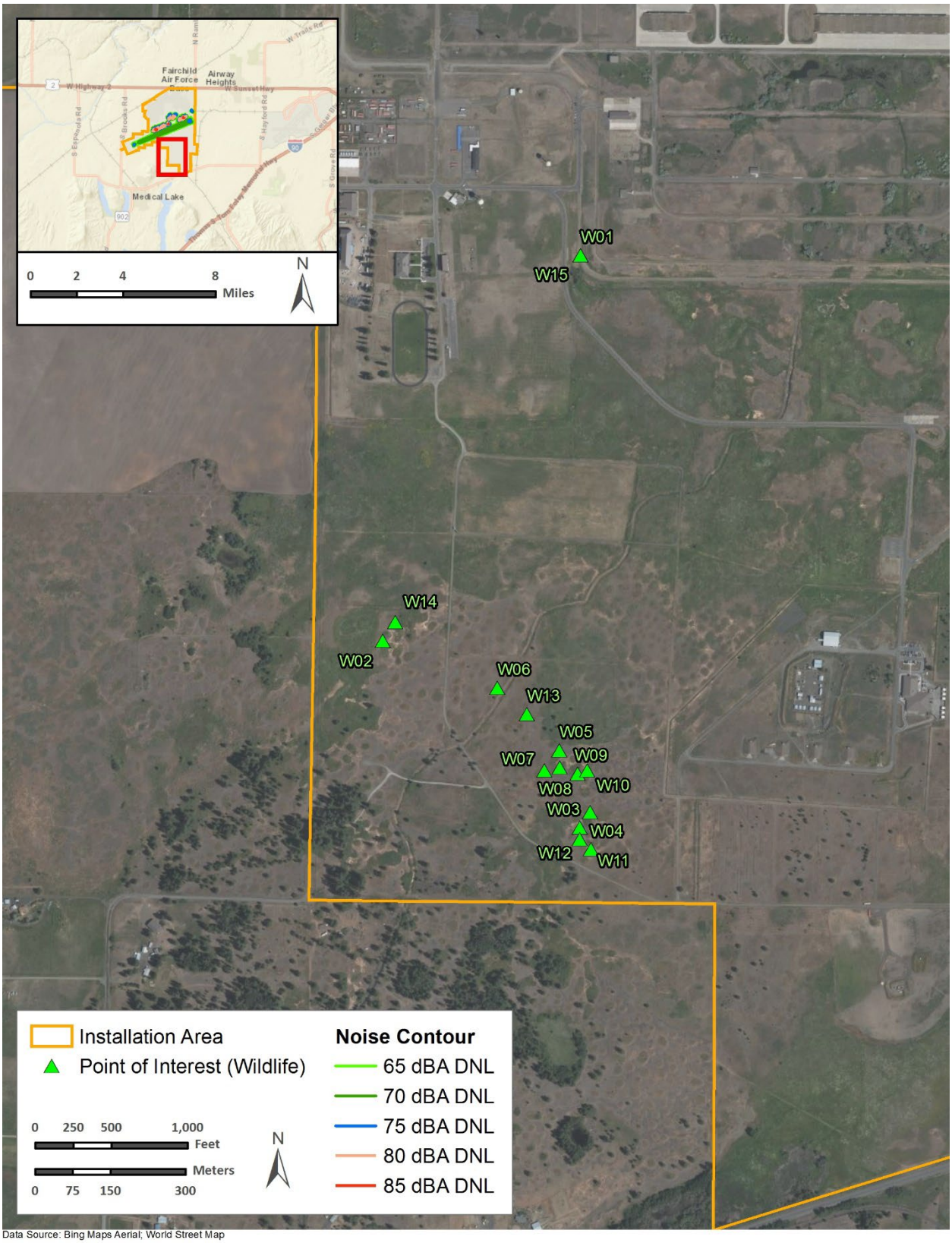
Speech Interference. The speech interference analysis analyzed only the DNL daytime operations at the residential and hospital POIs. Alternative 2 could potentially increase the number of outdoor speech interference events for R04 and H01 by 132 events annually due to KC-46A spiral closed patterns, as seen in **Table 3-34**. All other events result from transient F-18 operations, which would remain unchanged between the baseline and Alternative 2 scenarios.

Table 3-34. Annual Number of Daytime Events at or Above Outdoor 75 dB L_{max}

POI	ID	Baseline Events	Alternative 2 Events	Resulting Change in Annual Number of Events (+/-)
On-base Family Housing Centerpoint A	R01	6	6	0
On-base Family Housing Centerpoint B	R02	11	11	0
On-base Family Housing Centerpoint C	R03	11	11	0
On-base Family Housing Centerpoint D	R04	6	138	132
Fairchild AFB Hospital	H01	6	138	132
Eastern State Hospital	H02	6	6	0

Source: HMMH 2022

Noise Effects and Impacts on Wildlife. For the wildlife impact analysis, transient F-18 departures from Runways 05 and 23 would have the highest SEL at the wildlife POIs depicted in **Figure 3-16. Table 3-35** shows the L_{max} of the two flight profiles. Because transient F-18 departure operations would not change under Alternative 2 relative to the baseline, no change to wildlife effects would be expected.



Data Source: Bing Maps Aerial; World Street Map

Figure 3-16. Modeled Wildlife POIs at Fairchild AFB

Table 3-35. Estimated Maximum Sound Levels at Wildlife POI for Baseline and Fairchild Alternative

Wildlife Site	ID	L_{max} (dB)
Raptor Nest	W01	98
Spalding's Catchfly Monitoring Location A	W02	93
Spalding's Catchfly Monitoring Location B	W03	90
Spalding's Catchfly Monitoring Location C	W04	90
Spalding's Catchfly Monitoring Location D	W05	91
Spalding's Catchfly Monitoring Location E	W06	92
Spalding's Catchfly Monitoring Location F	W07	91
Spalding's Catchfly Monitoring Location G	W08	91
Spalding's Catchfly Monitoring Location H	W09	91
Spalding's Catchfly Monitoring Location I	W10	91
Spalding's Catchfly Monitoring Location J	W11	90
Spalding's Catchfly Monitoring Location K	W12	90
Spalding's Catchfly Monitoring Location L	W13	92
Spalding's Catchfly Monitoring Location M	W14	94
Spalding's Catchfly Monitoring Location N	W15	98

Source: HMMH 2022

Potential for Hearing Loss. As discussed in **Section 3.3.1.2.2**, per DoD policy, the PHL risk for populations exposed to less than 80 dBA DNL is generally small, so calculation of PHL is only required for populations exposed to 80 dBA DNL or greater. As shown in **Figures 3-10** and **3-11**, the 80-dBA DNL contours for the baseline are, and Alternative 2 would be, confined within the installation boundaries and would not overlay on-installation housing or population centers, so calculation of PHL is not required for Alternative 2.

3.4.2 Biological Resources

The ROI for the biological resources analysis is defined in **Section 3.3.2**.

3.4.2.1 Affected Environment

Vegetation. Fairchild AFB lies within the northeastern portion of the Columbia Basin, where grasslands and shrub-steppe communities transition into ponderosa pine (*Pinus pondersa*) forest. Historically, the land was dominated by shrub-steppe and grasslands mixed with ponderosa pine within and surrounding Fairchild AFB. The original installation vegetation has been altered by past farming, grazing, and military development, and training that changed or displaced natural systems and ecological processes. Currently, drier sites tend to have perennial grassland community associations dominated by bluebunch wheatgrass (*Pseudoroegneria spicata*) and Idaho fescue (*Festuca idahoensis*), while wetter areas are composed of aspen (*Populus tremuloides*), Douglas fir (*Pseudotsuga menziesii*), and wetland plants (Fairchild AFB 2018).

Approximately 1,400 acres of undeveloped areas occur on Fairchild AFB, primarily in the northeastern corner and the southern portion of the installation. These areas are composed of wetlands, open non-native grass fields, thickets of Russian olive (*Elaeagnus angustifolia*), ponderosa pine stands, shrub fields, and native grassland mixed with invasive plants. The approximately 2,800 acres of developed areas are predominantly in the northern portion of the installation. These areas consist primarily of landscaping and turf surrounding buildings, recreation areas, and residential facilities. The installation's landscaping is designed to provide a low-maintenance and attractive environment to enhance natural and human-made features. (Fairchild AFB 2018). The Project Area occurs within semi-developed or developed grounds. The vegetation is maintained regularly, and the grounds are not considered natural vegetation areas.

Wildlife. The majority of the Fairchild AFB wildlife species occur within the southern portion of the installation, where wetlands and other undeveloped natural habitats are present. Native mammal species documented on the installation include white-tailed deer (*Odocoileus [O.] virginianus*), mule deer (*O. hemionus*), coyote (*Canis latrans*), and badger (*Taxidea taxus*). Some small mammal species documented on the installation include voles (*Microtus* spp.), ermine (*Mustela ermine*), deer mouse (*Peromyscus maniculatus*), yellow-bellied marmots (*Marmota flaviventris*), and Columbian ground squirrels (*Urocitellus columbianus*) (Fairchild AFB 2018).

Common bird species include red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), northern harrier (*Circus cyaneus*), ring-necked pheasant (*Phasianus colchicus*), and migrant songbird and waterfowl species. Migrant songbird species on the installation include blue-headed vireo (*Vireo solitarius*), Wilson's warbler (*Cardellina pusilla*), and golden-crowned kinglet (*Regulus satrapa*). Fairchild AFB is within a bird migration corridor primarily designated for waterfowl, known as the Pacific Flyway. Large numbers of Canada geese (*Branta canadensis*) and ducks are known to migrate through this area. In the developed areas in the northern portion of the installation, American robin (*Turdus migratorius*), purple finch (*Haemorhous purpureus*), and cedar waxwing (*Bombycilla cedrorum*) have been observed (Fairchild AFB 2018).

A 2013 survey documented four reptile and three amphibian species on Fairchild AFB. Reptile species include the Western terrestrial garter snake (*Thamnophis [T] elegans*), Valley garter snake (*T. sirtalis*), racer snake (*Coluber constrictor*), and painted turtle (*Chrysemys picta*). Amphibian species include the long-toed salamander (*Ambystoma macrodactylum*), Pacific treefrog (*Pseudacris regilla*), and Columbia spotted frog (*Rana luteiventris*) (USACE 2013). The Columbia spotted frog, a Washington State candidate species, was detected at high levels in a constructed ditch within the flightline area (Fairchild AFB 2018).

Special Status Species. There is the potential for 22 species federally protected under ESA, state-listed species, BGEPA species, and MBTA-protected species to occur on Fairchild AFB. The list of special status species was based on data provided in the Fairchild AFB INRMP, the USFWS Information for Planning and Consultation report generated for the installation, the USFWS MBTA list, information obtained from the Washington Department of Fish and Wildlife, and the U.S. Forest Service Pacific Northwest Region Rare Plant Profiles list (Fairchild AFB

2018; WDFW 2022; WA DNR 2021; USFWS 2020, 2022c). **Table 3-36** lists those special status species that could occur on Fairchild AFB, and **Figure 3-17** shows locations of the special status species that have been observed within the biological resources ROI.

While no federally or state-listed wildlife species have been documented on the installation, eight federally and state-listed, or federal candidate wildlife species have the potential to occur on or around Fairchild AFB. These species with the potential to occur on the installation include the upland sandpiper (*Bartramia longicauda*), ferruginous hawk (*Buteo regalis*), yellow-billed cuckoo (*Coccyzus americanus*), American white pelican (*Pelecanus erythrorhynchos*), sharp-tailed grouse (*Tympanuchus phasianellus*), northern leopard frog (*Lithobates pipiens*), monarch butterfly (*Danaus plexippus*), and bull trout (*Salvelinus confluentus*). The upland sandpiper, ferruginous hawk, yellow-billed cuckoo, and American white pelican are also MBTA-protected. Both the BGEPA and MBTA-protected bald eagle and golden eagle (*Aquila chrysaetos*) have also been documented on Fairchild AFB, although no nests have been reported on the installation.

One federally and state-listed plant species, and four state-listed plant species have been documented on Fairchild AFB; none of these species have been documented within the Project Area. Protected plant species include inch-high rush (*Juncus uncialis*), foxtail mousetail (*Myosurus alopecuroides*), American pillwort (*Pilularia americana*), northwestern yellowflax (*Sclerolinon digynum*), and Spalding's catchfly (*Silene spaldingi*). Additionally, seven state-listed plant species have the potential to occur on or around Fairchild AFB and include the grand redstem (*Ammannia robusta*), yellow lady's slipper (*Cypripedium parviflorum*), palouse goldenweed (*Pyrrocoma liatriformis*), water howellia (*Howellia aquatilis*), dwarf rush (*Juncus hemiendytus var. Hemiandytus*), Austin's knotweed (*Polygonum austiniae*), and Rocky Mountain bulrush (*Schoenoplectus saximontanus*). These species have not been documented on Fairchild AFB, and no suitable habitat occurs on or around the Project Area; therefore, they are not discussed further (Fairchild AFB 2018).

Protected bird species that have the potential to occur within the airspace include the upland sandpiper, ferruginous hawk, yellow-billed cuckoo, American white pelican, sharp-tailed grouse, bald eagle, and golden eagle. Because Fairchild AFB is in a migration flyway for migratory birds, bird/wildlife-aircraft strikes during takeoffs and landing and on the runway have been documented as an ongoing hazard. To minimize bird/wildlife-aircraft strike hazards, Fairchild AFB developed the 2021 BASH Plan, which implements both AFI 91-202*, U.S. Air Force Mishap Prevention Program,* and AFI 91-212*, Bird/Wildlife Aircraft Strike Hazard Management Program*. This plan continues to mitigate risks of strikes by employing strategies, including, but not limited to, annual reports, a BASH working group, and necessary depredations (Fairchild AFB 2021a).

In addition to the BASH Plan, on June 1, 2022, Fairchild AFB adopted the USDA's April 2021 *Final Environmental Assessment for Mammal Damage Management in Washington*. This Environmental Assessment analyzed legally available non-lethal and lethal methods to control nuisance mammal populations, which will assist with BASH depredation protocols and increase safety on the airfield (USDA APHIS Wildlife Services-Washington 2021).

Table 3-36. Special Status Species that Potentially Occur on Fairchild AFB

Species	Status	Distribution	Habitat	Documented on Fairchild AFB?	Suitable Habitat in Project Area?
Birds					
Golden eagle (*Aquila chrysaetos*)	BGEPA MBTA	Common in open dry forests of eastern Washington	Commonly nest in rocky cliffs; often seen foraging in alpine parkland and rocky alpine areas at high elevation and clear cuts at moderate elevations	Yes	No
Upland sandpiper (*Bartramia longicauda*)	SE MBTA	Formerly very local and rare breeders in eastern Spokane County in the Spokane Valley between Spokane and Idaho; no records since 1993; unlikely to occur	Grasslands and agricultural areas where grain crops, alfalfa, and grazed pastures predominate; nesting occurs in areas where grasses and/or forbs provide cover averaging between 4 and 16 inches in height	No	No
Ferruginous hawk (*Buteo regalis*)	SE MBTA	Uncommon, local, and declining in southcentral Washington and east along the Snake River; could occur on the installation	Shrub-steppe and grassland regions of several eastern Washington counties; nests on cliffs, high bluffs, utility towers, trees, or on the ground	No	No
Yellow-billed cuckoo (*Coccyzus americanus*)	FT/SE MBTA	Predominantly western Washington, but potentially in the southwest as well	Prefer large, continuous riparian zones with cottonwoods and willows	No	No
Bald eagle (*Haliaeetus leucocephalus*)	BGEPA MBTA	Mostly along the western edge of Washington	Marine environments and nearly all major waterways, inland lakes, and reservoirs	Yes	No
American white pelican (*Pelecanus erythrorhynchos*)	ST MBTA	Mostly in the eastern side of the state, occasionally in the western side of the state	Preference for isolated islands in freshwater systems free from disturbance	No	No
Sharp-tailed grouse (*Tympanuchus phasianellus*)	SE	Found in the northern Columbia basin; could occur on the installation	Shrub/meadow steppe	No	No
Reptiles and Amphibians					
Northern leopard frog (*Lithobates pipiens*)	SE	Throughout eastern Washington	Semi-aquatic, requiring both aquatic and terrestrial habitats	No	No

Species	Status	Distribution	Habitat	Documented on Fairchild AFB?	Suitable Habitat in Project Area?
Insects					
Monarch butterfly (*Danaus plexippus*)	FC	Travels and breeds throughout Washington but does not overwinter	Lays eggs on obligate milkweed plants (*Asclepia* spp.)	No	No
Fishes					
Bull Trout[a] (*Salvelinus confluentus*)	FT	Throughout Washington	Cold, clean, and clear stream habitats, stable stream channels, and abundant overhead cover	No	No
Plants					
Grand redstem (*Ammannia robusta*)	ST	East of the Cascades, chiefly along the Columbia River	Shorelines along the Columbia River and riparian mudflats	No	No
Yellow lady's slipper (*Cypripedium parviflorum*)	ST	East of the Cascade Crest in Washington; could occur on the installation	Bogs, swamps, pond edges, and wet forests	No	No
Palouse goldenweed (*Pyrrocoma liatriformis*)	ST	Southeast Washington and adjacent Idaho	Transition zones between prairie and ponderosa pine	No	No
Water howellia (*Howellia aquatilis*)	ST	In Washington, it occurs within the Columbia Basin and Puget Trough physiographic provinces; has not been observed on the installation	Wetlands within forested channeled scablands (flat, elevated land deeply scarred by channels of glacial origin and with poor soil and little vegetation)	No	No
Dwarf rush (*Juncus hemiendytus var. Hemiandytus*	ST	Throughout Washington	Vernal pools and vernally wet meadows above 2,300 to 2,430 feet	No	No
Inch-high rush[a] (*Juncus uncialis*)	ST	Eastern, and central southern Washington	Margins of ponds and vernal pools	Yes	No
Foxtail mousetail (*Myosurus alopecuroides*)	ST	East of the Cascades crest in Washington; Washington south	Sagebrush-steppe	Yes	No
American pillwort (*Pilularia americana*)	ST	East of the Cascades in far eastern Washington; disjunct in eastern Washington	Vernal pools at elevations of 1,930 to 2400 feet	Yes	No

Species	Status	Distribution	Habitat	Documented on Fairchild AFB?	Suitable Habitat in Project Area?
Austin's knotweed (*Polygonum austiniae*)	ST	Central Oregon to northeast California, east to Idaho and southcentral Montana; in Washington, this species occurs in Grant and Spokane Counties; may occur on the installation	Shrub-steppe, ponderosa pine	No	No
Northwestern yellowflax (*Sclerolinon digynum*)	ST	In Washington, it is known to occur in Spokane County; has been observed on the installation	Vernal pool margins, receding lakeshores, meadows, and seasonally wet gravelly to rocky soils; in eastern Washington, it occurs in grasslands and biscuit-swale topography	Yes	No
Rocky Mountain bulrush (*Schoenoplectus saximontanus*)	ST	Throughout Washington	Freshwater ponds, damp soils, ditches, and vernally moist areas	No	No
Spalding's catchfly (*Silene spaldingi*)	FT/ST	In Washington, it occurs in the Blue Mountains and Columbia Basin physiographic provinces in Asotin, Lincoln, Spokane, and Whitman Counties; has been observed on the installation	Open native grasslands with a minor shrub component, occasionally with scattered conifers; has been documented in the southwestern corner of the installation	Yes	No

Sources: Fairchild AFB 2018; USFWS 2020, 2022c; WDFW 2022; WA DNR 2021

[a] Species is not in the Project Area but is within the expanded ROI used only for analysis of operational noise impacts.

Key: BGEPA = Bald and Golden Eagle Protection Act; E = Endangered; F = Federal; MBTA = Migratory Bird Treaty Act; T = Threatened; S = State; C= Candidate Species (federal designation)

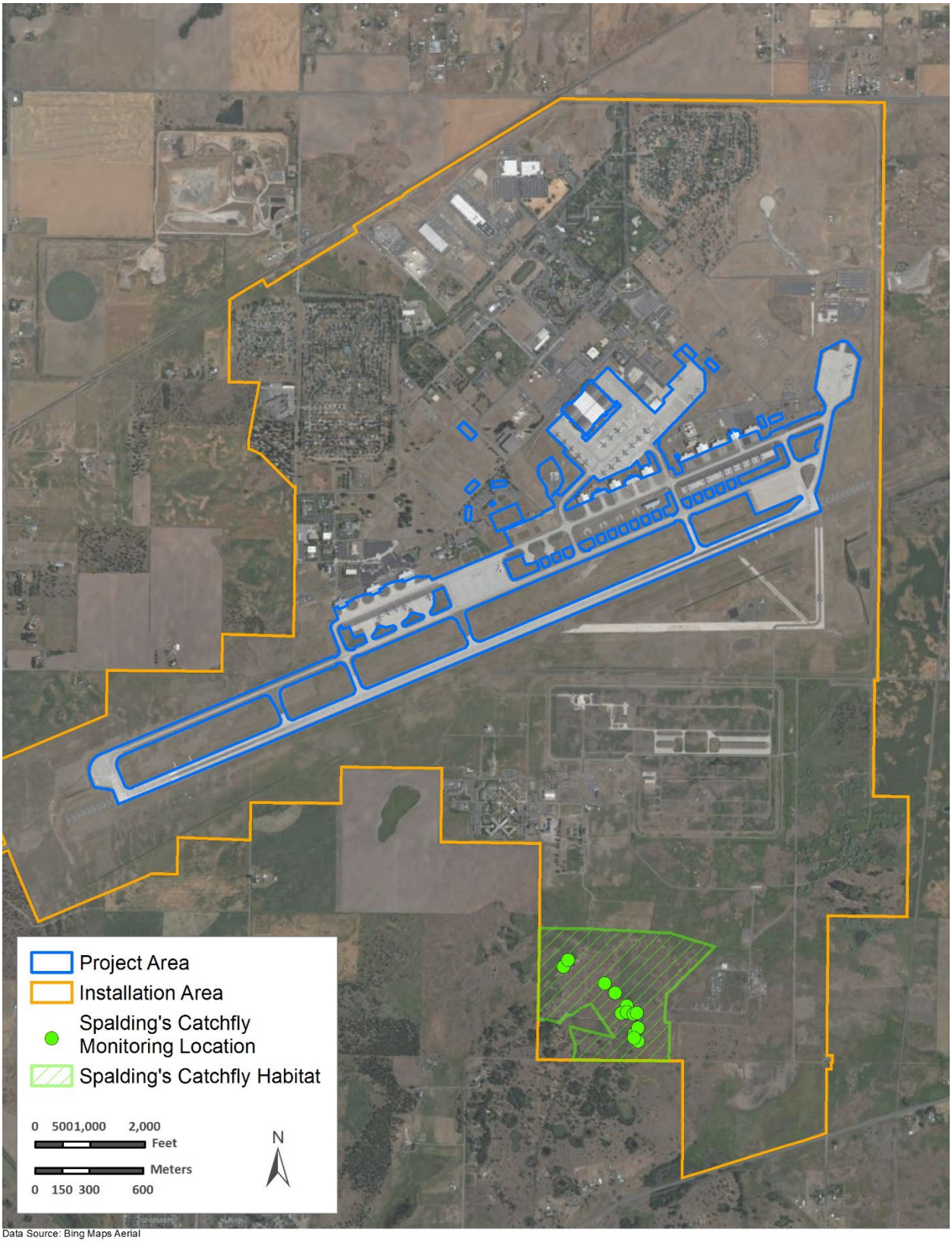


Figure 3-17. Fairchild AFB Special Status Species Observation and Habitat

The USFWS has not designated any portion of Fairchild AFB as critical habitat for federally listed species (USFWS 2022c).

Wetlands. Approximately 215 acres of disturbed and semi-natural wetlands occur on Fairchild AFB (shown in **Section 3.4.6**, **Figure 3-19**). A 2006 wetlands delineation report notes that all wetlands within the installation are isolated depressions, vernal pools, or constructed drainage ditches. Wetland conditions range between nearly undisturbed to significantly disturbed. Vernal pools are included in the Conservation Area established for the Spalding's catchfly (Fairchild AFB 2018).

All wetlands on Fairchild AFB have been determined to be "isolated" and are therefore not regulated under Section 404 of the Clean Water Act. Under state laws and regulations, the State of Washington nonetheless maintains regulatory authority over all wetlands in the state. Most wetlands on the installation are significantly disturbed, primarily from practices previous to the establishment of Fairchild AFB (Fairchild AFB 2018). No wetlands occur within the Project Area; the wetlands south of the Project Area are not expected to be impacted by the construction or operation of Alternative 2.

3.4.2.2 Environmental Consequences

3.4.2.2.1 Analysis Methodology

The analysis methodology used to assess impacts on biological resources under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.2.2.1**.

3.4.2.2.2 Alternative 2

Vegetation. Short- and long-term, minor, adverse impacts on vegetation would occur from temporary disturbance of vegetation and soil compaction during construction, demolition, and renovation and from permanent vegetation removal for new facilities and infrastructure under Alternative 2. Short-term, minor, adverse impacts would occur from temporary disturbance of vegetation from the use of heavy equipment and may include trampling and soil compaction. Areas of temporary ground disturbance would be reseeded with native vegetation. Permanent removal of vegetation and trees at new construction sites would create long-term impacts from permanent reduction in cover on the installation, however since areas of the Project Area are already highly disturbed from ongoing routine maintenance and landscaping activities and are of low ecological value, these impacts would be minor. These areas are not considered natural vegetation areas; therefore, there would be no impacts on native vegetation. There are no anticipated impacts to vegetation from the operations of Alternative 2.

Wildlife. Short-term, negligible to minor, adverse impacts from increased noise and potential displacement of wildlife due to actions associated with construction, demolition, and renovation; long-term, negligible, adverse impacts from permanent habitat loss along the flight line; and long-term, minor to moderate, adverse impacts from an increase of anticipated annual aircraft operations would occur on wildlife. Although some birds, small mammals, invertebrates, and other common small wildlife species may use the Project Area for shelter and feeding, the abundance of wildlife in these areas is low because vegetation is regularly disturbed, and few native plant species occur. Additionally, the Project Area does not overlap the portions of the

installation where wetlands and higher-value wildlife habitat are located to result in effects on those resources.

Short and long-term, negligible to minor, adverse impacts on wildlife would occur from noise associated with heavy equipment use and increased human presence during facility construction, demolition, and renovation. The increase in the frequency or intensity of noise from facility construction, demolition, and renovation could displace wildlife, and proposed construction activities would require use of heavy equipment that would generate short-term increases in noise near the area. Noise levels and sources would be similar to what was described for the Alternative 1 analysis in **Section 3.3.2.2.2**.

Long-term, negligible, adverse impacts on wildlife would occur from the permanent loss of potential habitat for wildlife along the flight line where facility and infrastructure developments would be completed. The loss of habitat would have only negligible impacts because the proposed construction activities would occur on improved or semi-improved areas that do not provide high quality habitat for wildlife species. BMPs to reduce or avoid impacts would be similar to what was described for the Alternative 1 analysis in **Section 3.3.2.2.1**.

As noted in **Table 2-8**, approximately 16,758 annual operations are currently conducted at Fairchild AFB. Birds and other animals living below the flight paths at Fairchild AFB are exposed to noise from those operations year-round. Under this alternative those operations would increase by 29 percent to approximately 21,600 operations annually.

To evaluate the potential increase in noise levels from operations that would occur under Alternative 2, the DAF modeled the DNL for the proposed 13,221 KC-46A and 8,379 KC-135 operations per day. **Figure 3-11** shows the predicted DNL contours for Alternative 2 in comparison to the existing noise contours shown in **Figure 3-10**. As shown in these figures, the 65-dBA DNL contour would be increased by 147 acres, and the 70 dBA contour would be increased by 138 acres compared with the existing contours under Alternative 2. All proposed operations would take place within existing flight patterns and airspace, and no additional shifts in the noise contours would occur. As discussed in **Section 3.4.1.2.2**, transient F-18 operations would have the highest SEL. Because there would be no change to transient F-18 operations under Alternative 2, the noise impacts on wildlife from these activities be unchanged from would existing conditions (refer to the *Noise Effects and Impacts on Wildlife* subsection in **Section 3.4.1.2.2** for more discussion).

Long-term, minor to moderate, adverse impacts on wildlife would continue to occur from the anticipated annual aircraft operations increase. The adverse impacts would be from noise associated with aircraft operations, as well as increased potential for increased bird/wildlife-aircraft interactions. The Fairchild AFB BASH Plan would continue to implement procedures and actions to minimize the potential for bird/wildlife-aircraft strikes for all airfield operations. Fairchild AFB would also update their BASH Plan to incorporate KC-46A operations to minimize the risk of bird/wildlife-aircraft strikes.

Special Status Species. Short-term, minor, adverse impacts from increased noise and potential displacement of wildlife due to actions associated with construction; long-term, negligible, adverse impacts from permanent habitat loss along the flight line where species have

the potential to occur; and long-term, minor to moderate, adverse impacts on special status species would occur from an increase of anticipated annual aircraft operations and would be similar to what is described for the **Wildlife** section above.

Under the ESA, Alternative 2 would have no effects on the federally listed yellow-billed cuckoo or the candidate monarch butterfly species; these species have never been documented on or around the installation. Noise impacts on federally listed species from construction and operations would be minor and similar to those described within the **Wildlife** section. In accordance with the MBTA and EO 13186, construction activities associated with this alternative would be completed in a manner to avoid or minimize adverse effects on migratory birds as much as possible. Additionally, the Fairchild AFB BASH program would continue to employ strategies to limit and minimize bird/wildlife-aircraft collisions.

No effect on the federally listed Spalding's catchfly would occur from implementation of Alternative 2. The only documented population of this species is in the southern portion of the installation and therefore, there is no potential for Alternative 2 to affect this species.

No effect is anticipated for the federally listed bull trout (*Salvelinus confluentus*); no in-water construction is planned for the ROI, and no other direct or indirect impacts from construction are expected. Aircraft sound is reflected off water, and aquatic species do not experience the same level of sound as terrestrial species.

A courtesy letter was submitted to the USFWS in December 2022, which provided the DAF's finding that Alternative 2 would have no effect on the federally listed yellow-billed cuckoo, the candidate monarch butterfly, the Spalding's catchfly, or bull trout. On January 9, 2023, Fairchild AFB received confirmation that no Section 7 consultation with USFWS was necessary because all potentially impacted species had a "no effect" determination. Available documentation for the ESA Section 7 consultation is provided in **Appendix A**.

Short-term, negligible, adverse impacts from noise associated with construction and operations could occur on the following state-listed wildlife species: upland sandpiper, ferruginous hawk, American white pelican, sharp-tailed grouse, and northern leopard frog. Noise impacts would be similar to those described within the **Wildlife** section above. No impacts are expected on the following state-listed plant species: the grand redstem, yellow lady's slipper, palouse goldenweed, water howellia, dwarf rush, Austin's knotweed, lowland toothcup, or Rocky Mountain bulrush because these species have not been documented on the installation, and no habitat occurs on or around the Project Area.

If this alternative is selected, Fairchild AFB would collaborate with the Washington Fish and Wildlife Division to review state species of concern that have the potential to nest, live, or roost within the Project Area, which may include future surveys and implementation of protective measures.

Wetlands. No wetlands occur within the Project Area, therefore, no impacts on wetlands would occur under Alternative 2. **Figure 3-19** in **Section 3.4.6** shows the water resources within the Project Area.

3.4.3 Cultural Resources

The ROI and APE for the cultural resources analyses in this EIS are defined in **Section 3.3.3**.

3.4.3.1 Affected Environment

Architectural Resources. The 2021 ICRMP for Fairchild AFB is the cultural resources guidance document for planning and proposed activities at the installation. The ICRMP summarizes the results of multiple architectural inventories that have been conducted on Fairchild AFB since 1985. Fairchild AFB conducted installation-wide historic architecture surveys in 1990 and the mid-1990s, and completed additional studies of specific buildings in 2005 and 2007 (Fairchild AFB 2021b). Past architectural resources surveys at Fairchild AFB have identified three facilities eligible for listing in the NRHP that remain extant. One of these existing facilities, Building 2050 (a maintenance hangar), is in the APE (see **Figure 3-18**). The APE also includes the area once known as the Flight Line Historic District (see below for more information) and three buildings that were considered contributing resources to the former district: Buildings 1003, 1013, and 2050.

The NRHP-eligible Flight Line Historic District, identified in 2007, contained 24 buildings, 20 of which were considered contributing resources to the historic district. In November 2012, the 92 ARW Commander, the Washington State Department of Archaeology and Historic Preservation (which serves as the SHPO), and the Spokane City/County Historic Preservation Office executed an MOA allowing Fairchild AFB to demolish buildings within the Flight Line Historic District. In December 2017, the above parties agreed to extend the terms of the MOA to December 2022. Adverse effects on the Historic District and its former contributing resources are considered mitigated, according to the ICRMP (Fairchild AFB 2021b). Fairchild AFB also executed an MOA in 2004 regarding repairs and partial replacement of the roof at Building 2050. As a result of the 2004 MOA, Building 2050 received Level II HABS documentation to mitigate the changes to the roof.

Archaeological Resources. The ICRMP summarizes the results of multiple archaeological inventories that have been conducted on Fairchild AFB since 1985. Past archaeological surveys have identified seven archaeological sites on Fairchild AFB and its geographically separate units. Of those known sites, two have been determined eligible for listing in the NRHP and five have been determined not eligible for listing in the NRHP (Fairchild AFB 2021b). On the main installation, a survey in 1988 was conducted for 640 acres in the southern portion of the installation.

After conducting a building survey in 1990, the Spokane City/County Historic Preservation Office determined that due to the high degree of disturbance, no additional archaeological surveys of the installation were warranted unless there was an inadvertent discovery of archaeological resources. None of the previously identified archaeological sites are in the APE, and no ground-disturbing activities would occur near known archaeological sites at Fairchild AFB under the Proposed Action.

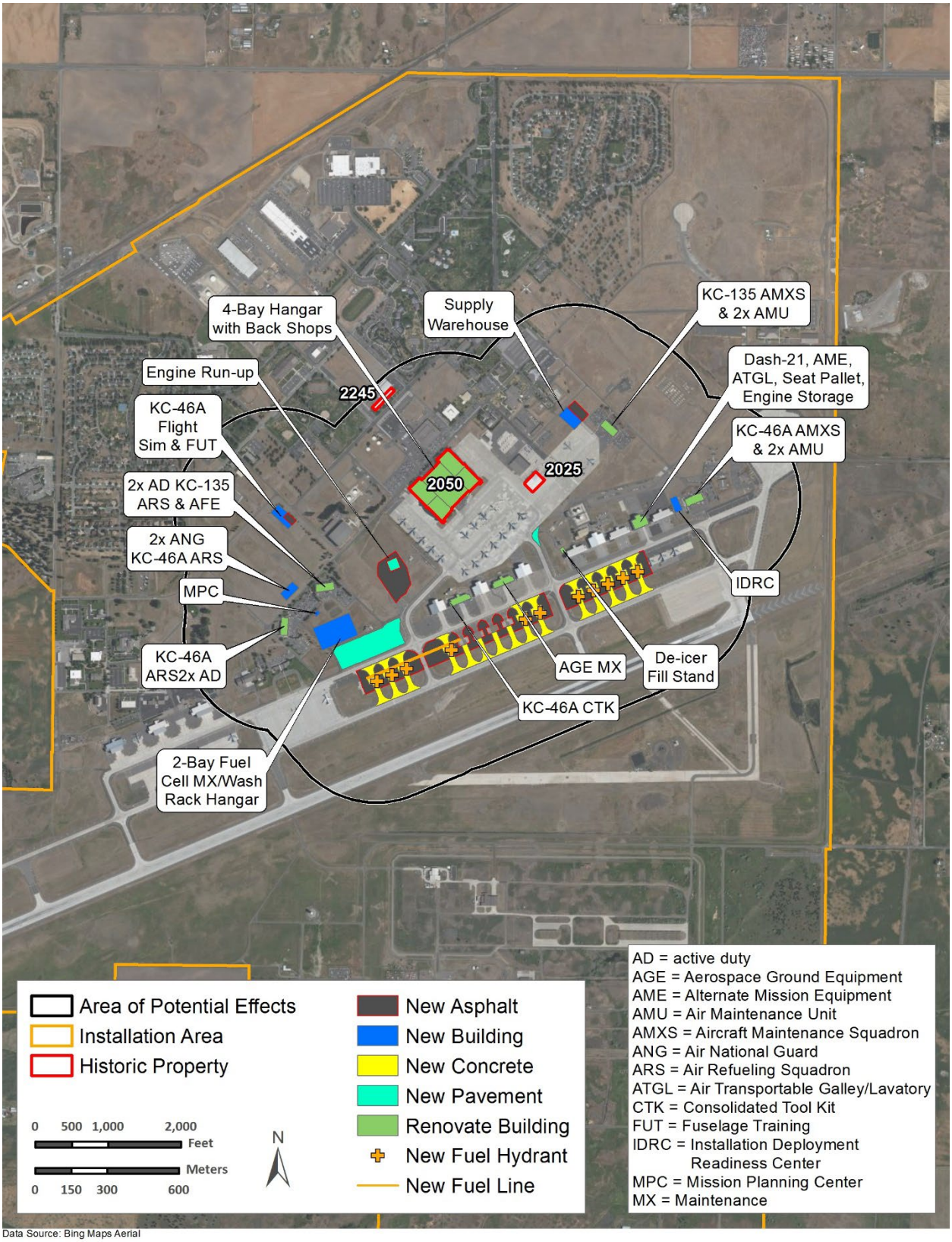


Figure 3-18. Historic Resources in the Fairchild AFB APE

Traditional Resources. Fairchild AFB regularly consults with four federally recognized tribes as part of the NEPA and Section 106 processes, including the Coeur d'Alene Tribe, Confederated Tribes of the Colville Reservation, the Kalispel Indian Community, and the Spokane Tribe of Indians. No known properties of traditional religious or cultural importance or TCPs occur at Fairchild AFB, but a comprehensive traditional resources or TCP survey has not been conducted. During consultation for the KC-46A MOB 4 mission, the Spokane Tribe of the Spokane Reservation identified that Fairchild AFB is within 4 miles of the site of the September 1, 1858, "Battle of Four Lakes" area and is within the area of the September 5, 1858, "Battle of Spokane Plains." The Spokane Tribe noted that "over sixty documented sites of historic, archaeological, cultural, or spiritual significance to the Spokane Tribe [are] within a seven-mile radius" of the installation (see **Appendix A**; DAF 2018a). These sites are outside the APE. Argonne is currently conducting an ethnographic study at Fairchild AFB with the Confederated Tribes of the Colville Reservation and the Spokane Tribe of Indians. Fairchild AFB met with the Confederated Tribes of the Colville Reservation and the Spokane Tribe of Indians in December 2022 and are planning future meetings in 2023.

3.4.3.2 Environmental Consequences

3.4.3.2.1 Analysis Methodology

The analysis methodology used to assess cultural resource impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.3.2.1**.

3.4.3.2.2 Alternative 2

Architectural Resources. Potential short-term, negligible, adverse impacts on architectural resources under NEPA would include temporary atmospheric and auditory impacts from construction activities. Potential long-term, negligible, adverse impacts include the renovation of one individually eligible historic property, Building 2050.

HABS documentation of Building 2050 was previously completed to mitigate adverse effects under Section 106 for a previous undertaking. Fairchild AFB emailed consultation materials, including a request for concurrence on the APE, finding of Adverse Effects to Building 2050, and the aforementioned approach for consultation, to the Washington SHPO on May 3, 2023 (**Appendix A**). As requested by the Washington SHPO during subsequent communications, Fairchild AFB submitted the consultation materials and requested records through the Washington SHPO's online portal, Washington Information System for Architectural and Archeological Records Data, on June 20, 2023. The Washington SHPO responded with concurrence on the defined APE for the project on June 29, 2023 (**Appendix A**), while FAFB was continuing to provide requested materials. No further correspondence from SHPO was received on the project; as such, the Washington SHPO has not yet objected to DAF's conclusions.

Archaeological Resources. No known archaeological resources occur within the APE for Alternative 2. Therefore, the Proposed Action would have no impacts on known archaeological sites. Should inadvertent discoveries be made during construction or demolition, the standard operating procedures for inadvertent discoveries of archaeological resources outlined in the installation's ICRMP would be implemented.

Traditional Resources. No known properties of traditional religious or cultural importance or TCPs occur within the APE for Alternative 2. Therefore, Alternative 2 would have no impacts on known traditional resources. The DAF is continuing to consult with the federally recognized tribes over the course of the Section 106 and NEPA processes. A summary of tribal communications for the Proposed Action is included in **Table A-4** of **Appendix A**.

3.4.4 Socioeconomics

The ROI for socioeconomics analysis in this EIS is defined in **Section 3.3.4**.

3.4.4.1 Affected Environment

The socioeconomics ROI for Alternative 2 is Spokane County, Washington. Data for Washington State and local municipalities are provided for additional information and comparison.

Population. The 2020 U.S. Census Bureau population count for Spokane County was 539,339, which represents an approximate 14.5 percent increase since 2010 (USCB 2022a, 2022c). The populations of the cities of Spokane and Airway Heights increased between 2010 and 2020, with the population of Airway Heights increasing at a greater rate (75.9 percent) than that of Spokane (14.4 percent) (USCB 2022a, 2022c). The population of Medical Lake decreased approximately 3.6 percent from 2010 to 2020 (USCB 2020a, 2022a). **Table 3-37** shows the total population data for 2010 and 2020.

Table 3-37. Total Population in the Fairchild AFB Vicinity

Geographic Area	2010	2020	Percent Change (2010–2020)
Washington	6,724,540	7,705,281	14.5
Spokane County	471,221	539,339	14.4
City of Spokane	208,916	228,989	9.6
City of Airway Heights	6,114	10,757	75.9
City of Medical Lake	5,060	4,874	-3.6

Source: USCB 2020a, 2022a, 2022c

As presented in **Table 2-7**, the Fairchild AFB community includes 7,565 military and civilian personnel, military dependents, and family members. Total employment at Fairchild AFB consists of 5,170 people, including full-time military personnel, part-time Guardsmen, and civilian personnel. The installation supports 2,458 military dependents and family members. Additionally, Fairchild AFB supports 9,201 retirees living within 50 miles of the installation (Fairchild AFB 2020a).

Economic Activity (Employment and Earnings). In 2020, the percentage of people in the armed forces in the Spokane County labor force was 0.7 percent, while the armed forces percentages of the other areas identified in **Table 3-38** ranged from 0.3 to 3.9 percent (USCB 2020a). The table also shows the regional employment by industry in the Fairchild AFB vicinity. The total number of employed people in the civilian labor force in Spokane County in

2020 was 239,046. The industry employing the highest percentage of the civilian labor force in Washington, Spokane County, City of Spokane, City of Airway Heights, and City of Medical Lake was the educational services, and health care and social assistance industry. This industry employed more than 25 percent of the labor force in each of these areas, except the state of Washington where 21.6 percent were employed in this industry (USCB 2020a). Top private employers in Spokane County are Providence Healthcare, Kalispel Tribal Economic Authority/Northern Quest Resort and Casino, Wal-Mart Stores Inc., Gonzaga University, URM Stores Inc., MultiCare Healthcare, and AvistaCorp (GSI 2022a), while the top public and overall employer is Fairchild AFB (GSI 2022b).

Table 3-38. Employment by Industry in the Fairchild AFB Vicinity

	City of Airway Heights	City of Medical Lake	City of Spokane	Spokane County	Washington
Population 16 years and over in the labor force	3,121	2,300	110,720	255,882	3,904,996
Percent of labor force in the Armed Forces	3.3	3.9	0.3	0.7	0.9
Population of employed persons in civilian labor force	2,683	2,054	103,678	239,046	3,660,034
Percent Employed Persons in Civilian Labor Force (by Industry)					
Agriculture, forestry, fishing and hunting, and mining	0.5	0.0	1.1	1.3	2.5
Construction	5.1	1.8	5.1	6.6	7.0
Manufacturing	9.0	8.0	7.0	7.3	9.5
Wholesale Trade	2.9	0.0	3.0	3.5	2.7
Retail Trade	9.7	10.2	11.8	11.6	11.6
Transportation and warehousing, and utilities	6.1	3.9	4.5	5.2	5.5
Information	2.0	7.8	1.8	1.7	2.2
Finance and insurance, and real estate and rental and leasing	6.6	12.1	6.7	6.9	5.3
Professional, scientific, and management, and administrative and waste management services	9.0	1.2	10.7	9.6	13.6
Educational services, and health care and social assistance	25.3	25.2	27.5	27.4	21.6
Arts, entertainment, and recreation, and accommodation and food services	13.8	11.0	11.4	9.6	9.0
Other services, except public administration	5.7	6.2	4.6	4.7	4.5
Public administration	4.1	12.7	4.6	4.6	5.0

Source: USCB 2020a

The total economic impact of Fairchild AFB during FY 2020 was approximately $523.6 million. This includes payroll for military and civilian personnel of more than $323 million, creation of 2,615 jobs with an estimated value of approximately $133 million, and total expenditures of approximately $66 million (Fairchild AFB 2020a).

The per capita income in Spokane City, Airway Heights, and Medical Lake was $30,791, $20,559, and $27,266, respectively. The per capita income in Spokane County and Washington State was $32,766 and $40,837, respectively (USCB 2020a). As of January 2022, the unemployment rates (not seasonally adjusted) in Washington State, Spokane County, and City of Spokane were 5.1 percent, 5.6 percent, and 5.7 percent, respectively (BLS 2022b).

Housing. Three housing options are available for Fairchild AFB personnel, including privatized military family housing, unaccompanied housing, and off-installation housing.

The U.S. Census Bureau estimated more than 200,000 housing units were in Spokane County in 2020, of which approximately 13,000 units were vacant, representing a vacancy rate of 6.1 percent (see **Table 3-39**). More specifically, the homeowner vacancy rate in Spokane County was 0.9 percent and the rental vacancy rate was 3.4 percent. The vacancy rate in the City of Spokane was higher at 6.6 percent, while the vacancy rate in the cities of Airway Heights and Medical Lake were lower at 4.5 percent and 3.6 percent, respectively (USCB 2020a).

Table 3-39. Off-Installation Housing Units in the Fairchild AFB Vicinity

Geographic Area	Total Units	Vacant Units	Percent Vacant
Spokane County	219,964	13,462	6.1
City of Spokane	99,705	6,630	6.6
City of Airway Heights	2,483	112	4.5
City of Medical Lake	1,928	69	3.6

Source: USCB 2020a

Fairchild AFB has 641 privatized military family housing units located in four neighborhoods on the installation, with a current occupancy rate of 98 to 99 percent. There are 10 on-installation dormitories, with 472 total rooms for unaccompanied personnel. The dormitory occupancy rate is 99 percent due to ongoing renovations, but the rate is expected to decrease to 90 percent after renovations are complete.

Additionally, there are two on-installation lodging facilities. The Fairchild Inn on the main base has 63 guest rooms and 42 temporary lodging facility rooms, and the Survival Inn at the SERE school campus has 220 rooms and 384 beds configured for single and double occupancy. The Fairchild Inn is used by temporary duty, permanent change of station, and Space A guests, and the Survival Inn is used by temporary duty personnel and SERE students (Fairchild AFB 2014).

Education. Spokane County is within Washington State Educational Service District 101 and includes all or part of 19 school districts. Five school districts exist within 5 miles of Fairchild AFB, including Medical Lake (5 schools), Cheney (11 schools), Reardan-Edwall (two schools), Great Northern (one school), and Spokane (56 schools) (OSPI 2022a, 2022b). Spokane Public Schools is the largest of these districts, with 58,170 students in pre-kindergarten through grade 12 during the 2021–2022 school year (OSPI 2022a). The district has 36 elementary schools, 9

middle schools, and 8 high schools, as well as various alternative learning options. During the 2020–2021 school year, there were 1,961 classroom teachers within the district, representing a student-to-teacher ratio of 14.7:1 (OSPI 2022c).

Fairchild AFB is within the Medical Lake School District. During the 2021–2022 school year, the district's total student enrollment was 1,874 students (OSPI 2022d). The district has two elementary schools, including Michael Anderson Elementary School on Fairchild AFB; one middle school; one high school; and one alternative high school. Michael Anderson Elementary School serves kindergarten through grade 5, and had 460 total students during the 2021–2022 school year. During the 2020–2021 school year, the school had 35 classroom teachers, representing a student-to-teacher ratio of 10.4:1 (OSPI 2022e).

To provide support for personnel with younger dependents, Fairchild AFB operates a child development center, Military Spouse Appointment Childcare program, and a School Year Childcare Program (92 FSS 2022).

Public Services. Public services in Spokane County consist of law enforcement, fire protection, and emergency medical services. The Spokane County Sheriff's Office provides law enforcement services for the county, and has civil and patrol divisions as well as an air support unit. The Sheriff's Office employs 220 commissioned deputies, including 2 undersheriffs, 3 captains, 9 lieutenants, 26 sergeants, and 41 detectives. (PST 2022). Other law enforcement agencies in the area include the City of Airway Heights Police Department.

Spokane County contains 11 fire districts and 7 municipal fire departments, including the cities of Airway Heights, Medical Lake, and Spokane, which provide fire protection services in the county (Spokane County 2021). Additionally, Spokane International Airport has a fire department. Emergency medical services are provided by the county fire districts and municipal fire departments, as well as a few private entities (SCETCC 2022).

Nine hospitals are within Spokane County, including a psychiatric hospital, Veterans Administration medical center, and rehabilitation center (WSHA 2021). The closest emergency rooms to Fairchild AFB are at Providence Sacred Heart Medical Center and Deaconess Medical Center in Spokane, which are approximately 11 to 12 miles from the installation.

Base Services. Law enforcement services (police) at Fairchild AFB are provided by the 92nd Security Forces Squadron, and fire protection and emergency services are provided through the 92nd Civil Engineer Squadron (Fairchild AFB Fire Department). The fire department also assists with emergencies in the surrounding community. There are two on-installation fire stations: Main Fire Station and Munitions Storage Area Fire Station (Fairchild AFB 2014).

The 92nd Medical Group operates the outpatient medical treatment facility (clinics) at Fairchild AFB for active-duty personnel, dependents, and retirees. The 92nd Medical Group occupies seven buildings and offers primary/family health care, pediatrics, flight medicine, dental, pharmacy, physical therapy, mental health, and laboratory services, as well as 24-hour ambulance service on the installation (Fairchild AFB 2014).

Other installation services are under the direction of the 92nd Force Support Squadron, including operation of two on-installation dining facilities and a fitness/aquatic center as well as

provision of community and family support services to installation personnel. Some of these services include childcare for children ages 6 weeks through kindergarten at the child development center, on- and off-installation recreational activities, youth and teen programs and centers, an Airman Family Readiness Center, and an installation library and theater.

3.4.4.2 Environmental Consequences

3.4.4.2.1 Analysis Methodology

The analysis methodology used to assess socioeconomic impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.4.2.1**.

3.4.4.2.2 Alternative 2

Long-term, negligible, adverse impacts on population, education, and housing at Fairchild AFB would occur from an increase in military personnel and their dependents under Alternative 2. A total net increase in installation personnel and associated dependents of approximately 13 percent would occur under Alternative 2. Approximately 338 personnel and 654 dependents would add to the demand for the built socioeconomic environment (housing, schools, public and base services). A portion of new KC-46A personnel may be able to be housed on-installation in units to be vacated by current KC-135 personnel proposed to be relocated. Adequate off-installation housing opportunities would be available in Spokane County through rentals or ownership, based on a current housing unit vacancy of 6.1 percent; housing unit vacancy varies among the off-installation areas surrounding Fairchild AFB (see **Table 3-39**). Because the majority of associated dependents would be housed with the personnel, the net increase in personnel should be able to find sufficient housing between on- and off-installation opportunities without putting significant strain on the Spokane County housing market. Additionally, on- and off-installation short- and long-term hotel, motel, and vacation rental opportunities could fill any gaps in housing availability at the start of the mission.

A less than 1 percent increase in student demand for the combined Spokane and Medical Lakes school districts would be expected. Child support and education for younger dependents can be found on-installation through the child development center or one of Fairchild AFB's family support programs.

The net increase of 992 full-time military personnel and military dependents would represent a 13 percent increase in military personnel and dependents at Fairchild AFB and less than a 0.2 percent increase in the Spokane County population. This slight population increase would not appreciably increase the installation's or the County's demands for law enforcement, fire protection, emergency medical services, or medical care.

Short-term, minor, beneficial, economic impacts would also be generated through local construction employment and project-related spending for the proposed infrastructure and utility upgrades. Long-term, negligible, beneficial impacts on local economic activity would be expected due to increased spending (purchase of goods and services, increased tax revenue) by the additional KC-46A mission personnel and dependents. This would provide negligible direct and indirect economic benefits.

3.4.5 Soils and Geology

The ROI for the soils and geology analysis is defined in **Section 3.3.5**.

3.4.5.1 Affected Environment

Fairchild AFB covers approximately 4,551 acres of land. The proposed construction and renovation would take place within the previously disturbed cantonment area of Fairchild AFB, as shown in **Figure 2-2**.

Physiography and Topography. Fairchild AFB is in the Channeled Scablands area of the Columbia Plateau physiographic province. The area is characterized by steep river canyons; extensive plateaus; and, in places, tall and sinuous ridges (WA DNR 2022). Deposits of glacial till, glacial moraine, or glacial outwash blanket the plain. Rolling hills of loess cover unglaciated areas to the south and east (USFS 2022).

The topography of Fairchild AFB and its immediate vicinity is generally flat, with an average elevation of 2,430 feet above MSL. The area is surrounded by mountains. The peaks of the Selkirk Mountains and Okanogan Range are 130 miles north of the installation, the Bitterroot Range of the Rocky Mountains is 90 miles east of the installation, the Blue Mountains are 100 miles south of the installation, the Cascade Mountain Range is 180 miles west of the installation, and the Kettle River Range is 45 miles northwest of the installation (Fairchild AFB 2018).

Geology. The Columbia Basin was formed by Miocene-age flood basalts and altered by glacial floodwaters from Lake Missoula in the Pleistocene Epoch that widened the Spokane River Valley, deposited a thick stratum of gravel, and formed the Channeled Scablands topography. The Wanapum and Grande Ronde are the two mapped basalt units in the area and are overlain with Quaternary-age unconsolidated gravel deposits and loess. Northwest of the installation is an area of dune sand. Basalt outcroppings, the result of cooled lava, are the prominent geological features and can be seen along the eastern edge of the installation. Perched water tables occur in many areas of the installation and are associated with stratified sand and clay soil layers deposited by the historic catastrophic floods. These areas present challenges to design, stormwater management, location of buried utilities and foundations, construction scheduling, and groundwater management (Fairchild AFB 2018).

Geologic Hazards. Fairchild AFB is at moderate risk from geologic hazards such as volcanism and earthquakes. The 2014 National Seismic Hazard map shows that Fairchild AFB has a seismic hazard rating of approximately 10 to 20 percent of the force of gravity (USGS 2014), making the risk of damage from seismic activity strong.

Soils. The USDA NRCS has mapped two soil types within the Project Area for soils and geology (USDA NRCS 2022). These soils and their descriptions are listed in **Table 3-40**.

Table 3-40. Soils within the Project Area at Fairchild AFB

Mapping Unit	Slope (%)	Characteristics
Cheney ashy silt loam	0 to 8	Very deep, well-drained soils that are moderately permeable
Phoebe-dry Bong complex	0 to 8	Very deep, somewhat excessively drained soils of moderate permeability

Source: USDA NRCS 2022

Prime Farmland. The implementing procedures of the Farmland Protection Policy Act (FPPA; 7 CFR Part 658) require federal agencies to evaluate the adverse effects (direct and indirect) of their activities on farmland, which includes prime farmland, unique farmland, and farmland of statewide or local importance, and to consider alternative actions that could avoid adverse effects. Both soils found in the Project Area are considered prime farmland. Cheney ashy silt loam, 0 to 8 percent slopes, and Phoebe-dry Bong complex, 0 to 8 percent slopes (if irrigated), are both considered prime farmland (USDA NRCS 2022). As per Section 1540(c)(1) of the FPPA, "farmland" does not include land already in or committed to urban development or water storage (which includes land with a density of 30 structures per 40-acre area, lands identified as an urbanized area on a U.S. Census Bureau map, urban areas mapped with a "tint overprint" on USGS topographical maps, or as "urban-built-up" on USDA Prime Farmland Maps).

3.4.5.2 Environmental Consequences

3.4.5.2.1 Analysis Methodology

The analysis methodology used to assess impacts on soils and geology under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.5.2.1**.

3.4.5.2.2 Alternative 2

New construction and facility additions would create ground disturbance and changes in existing impervious surfaces, resulting in negligible to moderate impacts on geology and soils. **Table 2-6** provides a summary of the ground disturbance and changes in impervious surfaces expected for Alternative 2.

Physiography and Topography. Long-term, negligible, adverse impacts would be expected on the natural topography in the Project Area from site preparation (i.e., grading, excavating, recontouring) and construction.

Geology. No impacts on geology would be anticipated from construction, demolition, and renovation actions associated with implementation of Alternative 2 because no geological resources would be disturbed.

Geological Hazards. Long-term, negligible, adverse impacts on or from geologic hazards would be expected. Due to the seismic activity in the area, there would be added risk of structural failure or damage to new or renovated facilities. All new construction associated with this alternative would be designed consistent with seismic safety regulations, which would reduce the potential for adverse impacts associated with structural failure during or following a seismic event.

Soils. Short- and long-term, moderate, adverse impacts on soils would be expected from implementation of Alternative 2 due to an increase in impervious surfaces, and associated erosion and sedimentation.

Impervious surfaces would increase by approximately 24.5 acres, and approximately 70.7 acres of ground disturbance, including demolition, would occur. The primary impacts would include soil compaction, disturbance, and erosion. Implementation of environmental protection measures and BMPs from project-specific and installation ESCPs and SWPPPs would be implemented to minimize adverse impacts on soils, such as silt fencing, sediment traps, application of water to disturbed soils, and revegetation of disturbed areas with native plants.

Compaction of soils during construction activities would disturb and modify the soil structure. Soil productivity, which is the capacity of the soil to produce vegetative biomass, would decline in disturbed areas and be eliminated in those areas within the footprints of new buildings, pavements, and roadways. Loss of soil structure due to compaction from foot and vehicle traffic could change drainage patterns. Impacts would be minimized through implementation of soil decompaction methods such as aeration. Site-specific geotechnical soil testing would be conducted prior to or during construction as required to determine if limitations relating to contamination exist and appropriate environmental protection measures to be implemented to minimize adverse impacts.

Prime Farmland. Although there are soils in the Project Area listed as prime farmland soils by USDA, they are already in a developed area and, therefore, do not qualify for “farmland” protections under the FPPA. No impacts on prime farmland soils are expected under Alternative 2.

3.4.6 Water Resources

The ROI for the water resources analysis is defined in **Section 3.3.6**.

3.4.6.1 Affected Environment

Groundwater. A portion of Fairchild AFB’s water supply is provided by several regional aquifers: the Spokane Valley-Rathdrum Prairie Aquifer, the Latah (Hangman) Creek Aquifer, and the West Plains Aquifer. Perched groundwater can occur 5 to 20 feet bgs. Shallow aquifers below Fairchild AFB are correlated with bedrock fractures filled with gravel or deep deposits of stratified sands and gravels, whereas deeper confined aquifers are correlated with basalt layers; major aquifers occur between 100 to 200 feet and at 400 feet bgs. Subsurface groundwater flow is easterly and southeasterly from the installation (Fairchild AFB 2018). A majority of drinking water for Fairchild AFB is drawn from the Rathdrum Prairie Aquifer. The Rathdrum Prairie Aquifer well depths range from 10 to 700 feet bgs with a median of 162 feet bgs (USGS 2016). A year-long water quality investigation conducted by the Idaho Department of Environmental Quality classifies the drinking water of this aquifer as “very good” (IDEQ 2012).

Surface Water. Fairchild AFB is within the Palouse and Low Spokane watersheds. No defined natural stream courses occur on Fairchild AFB, but wetlands with seasonal or persistent ponding and stormwater catchments or conveyances are present (see **Figure 3-19**; Fairchild AFB 2018). Additional information on wetlands is provided in **Section 3.4.2**.

Surface hydrology on Fairchild AFB can generally be described as also isolated from free-flowing surface waters within the watersheds. The nearest waterbodies to Fairchild AFB are the Spokane River, approximately 13 miles to the east, and several lakes (Medical, West Medical, Silver, Clear, Otter, and Granite Lakes) immediately south of the installation (DAF 2014b). Both Medical and Silver Lakes are listed as impaired under Section 303(d) of the Clean Water Act (Ecology 2022). Spokane River (located approximately 8 miles northeast of the installation) and Hangman Creek (located approximately 7 miles east of the installation) are the closest designated WOTUS to Fairchild AFB (USGS 2023).

Stormwater runoff sheet flows across the relatively flat landscape and ponds in depressional areas before infiltrating, evaporating, or being collected in human-made drains in the developed areas of the installation (Fairchild AFB 2018). The installation stormwater system is divided into eight basins, with Drainage Basin 1 being the largest, draining approximately one-third of Fairchild AFB and containing the most industrial activities (Fairchild AFB 2012). An NPDES permit is required for any construction activities more than 1 acre to ensure that sedimentation due to erosion does not affect local surface water quality. Fairchild AFB has been issued an NPDES MSGP to manage stormwater runoff and protect the quality of surface water on and near the installation.

Floodplains. No 100- or 500-year floodplains are located on Fairchild AFB (FEMA 2022). The closest 500-year floodplain is approximately 5 miles away (see **Figure 3-19**).

3.4.6.2 Environmental Consequences

3.4.6.2.1 Analysis Methodology

The analysis methodology used to assess water resource impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.6.2.1**.

3.4.6.2.2 Alternative 2

Groundwater. Short-term, negligible to minor, adverse impacts on groundwater resources could occur at Fairchild AFB due to increased demand for potable water and impacts on recharge rates due to increased impervious surfaces. No sensitive groundwater resources are known to occur in areas planned for any KC-46A development projects. No existing or proposed wells occur near the proposed sites. Excavation associated with the proposed construction, renovation, and demolition activities would not be anticipated to intersect the local groundwater table. Potential PFAS contamination and petroleum at Fairchild AFB in the Project Area could also leach into the groundwater during ground disturbance or daily operations under Alternative 2. Any groundwater that is dewatered during construction or operation would need to be containerized, sampled, and disposed of appropriately off-site. Refer to **Section 3.4.9** for more information about PFAS contamination and petroleum products at Fairchild AFB. Based on existing soil conditions, any incidental contaminant discharges (e.g., fuel, lubricants) from construction equipment would not be anticipated to reach the groundwater table, and all appropriate BMPs would be implemented to avoid such discharges.

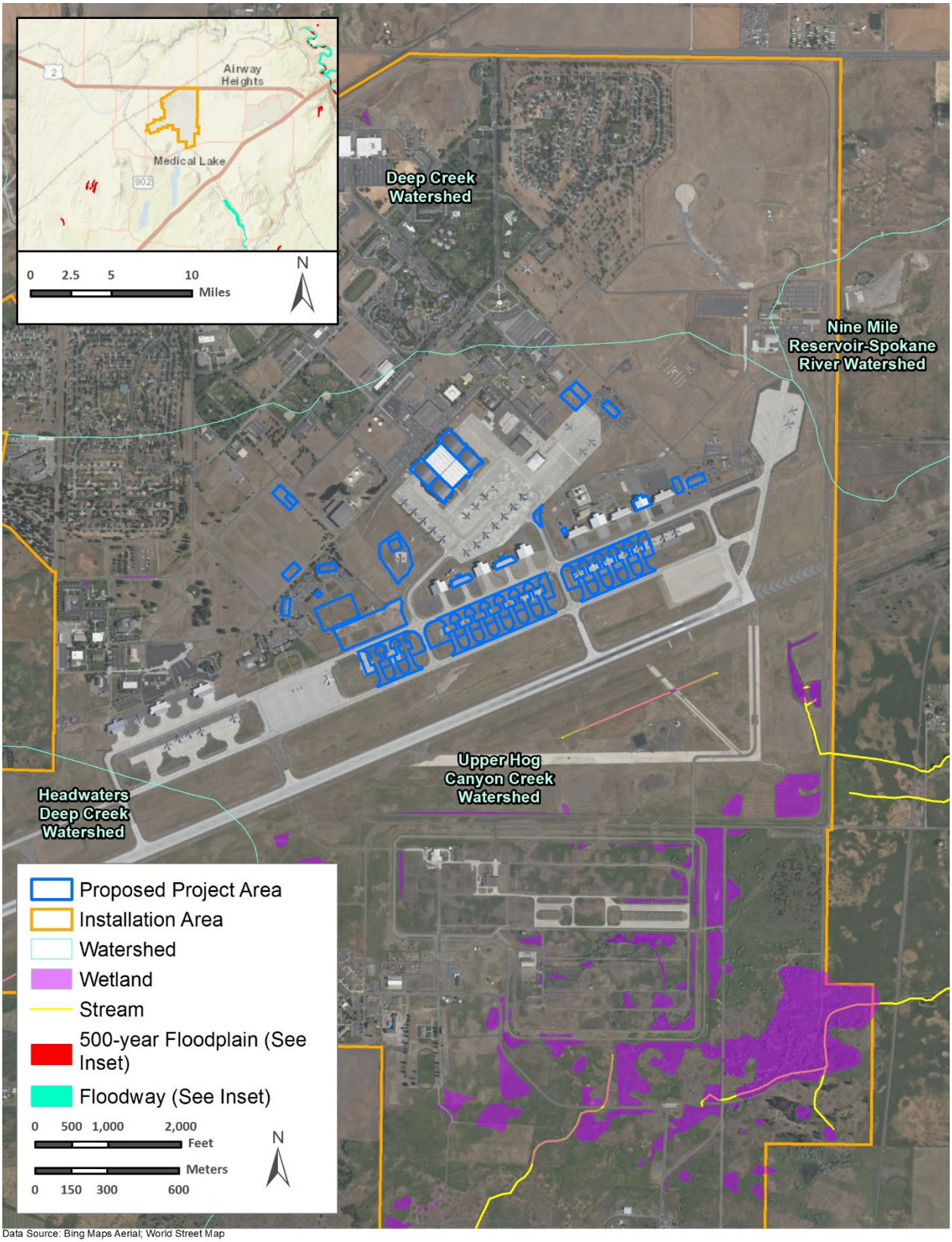


Figure 3-19. Water Resources at Fairchild AFB

Surface Water. Short- and long-term, minor to moderate, adverse impacts on surface water at Fairchild AFB would occur from increased runoff and associated erosion and sedimentation. These impacts would result from construction, demolition, and renovation as well as an increase in impervious surfaces under Alternative 2. Erosion could occur and associated sedimentation could flow into surface water features during construction. Construction activities resulting in ground disturbance (approximately 70.7 acres) would be conducted in accordance with the applicable stormwater discharge permit to control erosion and prevent sediment, debris, or other pollutants from entering the stormwater system. Construction activities such as clearing, grading, trenching, and excavating would displace soils. If not managed properly, disturbed soils would be washed as sediments into nearby waterbodies during stormwater events and reduce water quality. Erosion and sediment controls and stormwater management practices implemented consistent with the installation's general and the project-specific SWPPPs and ESCPs would minimize the potential for adverse impacts associated with erosion and sedimentation. Protection measures could include the use of silt fences and covering of soil stockpiles. Fairchild AFB is required to obtain coverage under the NPDES General Permit for all construction activities more than 1 acre to minimize impacts from sedimentation on water quality. Due to the distance between Fairchild AFB and the closest WOTUS, no impacts on WOTUS are anticipated.

New construction and facility additions would result in a potential increase in stormwater runoff due to an increase in impervious surfaces. The proposed parking apron, engine run-up area, and construction areas would result in a net increase of approximately 24.5 acres of impervious surfaces. The amount of new construction would be minimized by reusing facilities with modifications or additions, thereby reducing the increase of impervious surfaces. Most of the proposed development activities would occur in areas already developed and/or the previously disturbed cantonment area of Fairchild AFB. EISA requirements would be followed to maintain or restore, to the maximum extent practical, the predevelopment hydrology of the property with regard to rate, volume, and flow duration. All construction, renovation, and demolition activities would occur within Drainage Basin 1, which drains into two small ponds. These retention ponds help attenuate the stormwater flow from Drainage Basin 1 prior to discharge off-installation. Stormwater controls and BMPs implemented in accordance with a project-specific and installation SWPPPs and ESCPs would avoid the potential for adverse impacts on surface waters.

When deicing operations are performed without discharge controls in place, they can degrade nearby waterbodies. Deicing for KC-46A operations would occur in the same location and manner that aircraft deicing currently takes place at Fairchild AFB. Appropriate stormwater discharge permits would continue to be maintained under the NPDES program to ensure that wastes from deicing operations are properly collected and treated. KC-46A deicing activities would be conducted away from storm drains to prevent deicing effluent from entering the stormwater system. As part of its SWPPP, Fairchild AFB implements a variety of different actions to minimize aircraft deicing fluid pollution.

Floodplains. Proposed construction, demolition, and renovation would not occur within the 100-year floodplain. Therefore, no impacts on floodplains would be expected under Alternative 2.

3.4.7 Infrastructure and Transportation

The ROI for the infrastructure and transportation analysis is defined in **Section 3.3.7**.

3.4.7.1 Affected Environment

Potable Water. Potable water is provided to Fairchild AFB by the Fort George Wright Annex well complex, which includes five wells with a total capacity of 4,420 gallons per minute, or 6.4 mgd (WA DOH 2021). The wells draw groundwater from the Spokane Valley-Rathdrum Prairie Aquifer and Latah (Hangman) Creek Aquifer, and feed the Geiger Reservoir. Water from the reservoir is then piped to storage tanks at Fairchild AFB via a 16-inch City of Spokane water transmission line that enters the base. The installation's water storage system consists of three elevated water storage tanks and 10 ground storage tanks, with a total water storage capacity of 2.16 million gallons (0.51 million gallons at the Geiger Reservoir and 1.65 million gallons on the installation). The Fort George Wright Annex well complex, combined with the on-installation water storage capacity, provides an adequate supply of potable water to meet duration, flow rate, and pressure requirements for industrial and domestic consumption and fire protection (Fairchild AFB 2014). If water demand is not met by the well complex, two backup groundwater sources for potable water supply (i.e., an auxiliary well on Fairchild AFB and an emergency intertie with the City of Spokane) could supply an additional 4.6 mgd of potable water to the installation, for a total of 11 mgd of available capacity to the installation (Fairchild AFB 2021c, WA DOH 2021). In FY 2021, the average potable water demand was 1.6 mgd, with a peak demand of 3.1 mgd during July 2021 (Fairchild AFB 2021d). As of 2022, potable water at Fairchild AFB meets all USEPA and Washington State drinking water health standards (Washington State 2021). Water lines are within 500 feet of all facility and infrastructure project locations (Fairchild AFB 2014).

Electrical System. Electrical power at Fairchild AFB is provided by the Bonneville Power Administration through Avista Utilities via two on-installation 115-kilovolt (kV) substations (North and South). Both substations have three feeder circuits each, distributing power at 13.2 kV. The electrical system consists of the two substations, underground and overhead power lines, high-voltage switches, junction boxes, and transformers. Annual maintenance on the North and South substations are performed by Bonneville Power Administration. Additionally, the installation has adequate backup power systems (emergency diesel generators) to support priority facilities (DAF 2020). Energy conservation projects continue to be incorporated through efficient design and development to meet the federal requirement for reduced energy consumption on the installation.

The estimated maximum peak electrical loading for Fairchild AFB is 10.8 megawatts. In FY 2021, the average electrical demand was 5.3 megawatts, with the peak demand of 6.2 megawatts occurring in July 2021. Electrical demand at Fairchild AFB is approximately 57 percent of the peak load (Fairchild AFB 2021d). Electric distribution lines are within 500 feet of all facility and infrastructure project locations (Fairchild AFB 2014).

Natural Gas System. The natural gas system at Fairchild AFB consists of gas lines (steel and polyethylene piping), valves, vents, and meters. The steel pipes generally date from 1960, while the polyethylene pipes are less than 15 years old. The steel gas lines are protected from corrosion by a cathodic protection system. The natural gas system is privatized to Honeywell

and Avista Utilities (DAF 2020). In FY 2021, the average natural gas demand at the installation was approximately 20.7 million cubic feet, with the peak demand of 43.3 million cubic feet occurring in December 2021 (Fairchild AFB 2021d). The capacity of the natural gas system is unknown; however, Avista Utilities has sufficient capacity to support the needs of Fairchild AFB, because the utility provider supplied natural gas for an average of approximately 7.5 billion cubic feet of building space per month in 2021 (Fairchild AFB 2014, Avista Utilities 2022). Natural gas lines are present within 1,500 feet of all facility and infrastructure project locations.

Liquid Fuel Supply. The liquid fuel storage system at Fairchild AFB consists of a filtration house; a bulk storage farm with three tanks, a transfer system, and three hydrant-refueling systems with operating tanks; a ground products storage system; and two government-owned vehicle service stations. Liquid fuel is received by Fairchild AFB from a commercial pipeline and commercial tank trucks. Jet fuel is pumped via pipeline from the bulk storage farm in the northwestern portion of the installation and from storage tanks near the airfield to fuel hydrants within all aircraft parking areas. Fairchild AFB has a jet fuel capacity of approximately 4.6 million gallons, with 1.8 million gallons of storage demand, resulting in 61 percent available capacity. The distribution system can receive approximately 480,000 gpd, with an average demand of 360,000 gpd (Fairchild AFB 2014, DAF 2020).

Sanitary Sewer and Wastewater. The sanitary sewer system at Fairchild AFB consists of lateral lines from buildings, lift stations, 605 sewer maintenance holes, and 284,190 linear feet of sewer collection mains. The Spokane Wastewater Management Department treats most of the wastewater from the installation at the Riverside Park Water Reclamation Facility, approximately 9 miles northeast of the installation in northwestern Spokane. The only exceptions are two mounded drain field systems that Fairchild AFB operates and maintains on the southern side of the installation. The Riverside Park Water Reclamation Facility is on the eastern bank of the Spokane River and currently processes 34 mgd of sewage, which is approximately 23 percent of the 150-mgd peak capacity (Fairchild AFB 2014, City of Spokane 2022a). Fairchild AFB maintains a wastewater discharge permit (Permit #SIU-4581-01) issued by the City of Spokane Wastewater Management Department, which authorizes the installation to discharge a maximum of 2 mgd of wastewater; however, no surcharges occur for discharges over 2 mgd (City of Spokane 2020). As required by the permit, Fairchild AFB maintains a Sanitary Sewer Operations and Maintenance Manual, which provides guidance on the appropriate operations and maintenance procedures of the installation's sanitary sewer system (92 CES 2018). To comply with Washington Administrative Code 173-240-050, Fairchild AFB also maintains a General Sewer Plan, which supports sanitary sewer system maintenance and improvements in accordance with Washington Department of Ecology specifications (Luders 2017).

The maximum wastewater discharge capacity at Fairchild AFB is 2 mgd. Between 2013 and 2017, an average of 0.51 mgd was discharged to the reclamation facility, with a peak discharge of 1.99 mgd and a minimum discharge of 0.04 mgd. The average daily discharge was approximately 25 percent of the installation system capacity and approximately 99 percent of the permit allowance at peak daily discharge (City of Spokane 2020). Sanitary sewer lines are within 1,500 feet of all facility and infrastructure project locations (Fairchild AFB 2014).

Stormwater System. The stormwater system on Fairchild AFB consists of eight stormwater collection catch basins, drywells, collection piping, lagoons, ditches, and other stormwater conveyances. Drainage Basin 1, the largest of the eight basins, drains into two small ponds, which attenuate the stormwater flow from the basin prior to discharge off-installation. A stormwater conveyance system covers the central part of the installation and flightline areas with a separate conveyance system serving the southern portion of the installation. The remainder of the developed areas on the installation manage stormwater via sheet flow into open drainage ditches. Perched groundwater is present in many areas of the installation, and localized flooding/ponding may occur, especially in spring (DAF 2020).

Fairchild AFB operates under an NPDES Stormwater MSGP, and the stormwater drainage system is managed in accordance with the installation's SWPPP (92 CES 2015). The MSGP does not authorize stormwater discharges associated with construction activities; therefore, a separate NOI for an NPDES Construction General Permit and project-specific SWPPP must be filed with USEPA for all new construction activities that disturb 1 acre or more (USEPA 2021b). Details about Fairchild AFB's stormwater permit are described in **Section 3.4.6**. Stormwater infrastructure is present near the facility and infrastructure project locations.

Solid Waste Management. Solid waste at Fairchild AFB is managed via an ISWMP, in accordance with AFMAN 32-7002, *Environmental Compliance and Pollution Prevention* (Fairchild AFB 2021e). The Solid Waste Management and Recycling Program at Fairchild AFB includes off-installation solid waste disposal and an on-installation full-service recycling center, which is managed by Quality Support Services, Inc. at Building 2420. The installation diverts approximately 45 percent of nonhazardous waste and 70 percent of construction waste from landfills. Municipal solid waste collection and disposal is handled by Sunshine Disposal and Recycling. Under agreement with the City of Spokane and Spokane County, all municipal solid waste is taken to the Spokane Regional Waste-to-Energy Facility. Fairchild AFB disposes construction and demolition debris and special wastes generated by projects on the installation at the Graham Road Recycling and Disposal Center, which has a remaining permitted capacity of approximately 13,053,000 tons. Construction and demolition debris on Fairchild AFB is recycled to the greatest extent possible, and resulting wastes are disposed at various permitted disposal facilities, including Graham Road Recycling and Disposal Center (for special wastes and non-recyclable materials) and Spokane Regional Waste to Energy Facility (for municipal wastes) (Fairchild AFB 2014, DAF 2020, City of Spokane 2022b).

Communications System. The communications infrastructure at Fairchild AFB is capable of supporting voice, data, video, wireless, land mobile radio, aircraft communications, and security systems. The system includes a maintenance hole/duct system, which is used to distribute communication lines across the installation, including a secondary path around the flight line. The installation telephone system uses multiple switches to handle a variety of installation telephone requirements. Backbone communications components and technology at Fairchild AFB are dated and mostly copper. As facilities are modernized, renovated, or constructed, dated copper communications lines are replaced with new fiber optic communications lines. Three main switches are connected via a Synchronous Optical Network backbone. Communications infrastructure is present near the facility and infrastructure project locations (Fairchild AFB 2014, DAF 2020).

Airfield. The Fairchild AFB airfield includes the runway, aircraft taxiways, overruns, parking areas, and maintenance aprons. The installation includes a single 13,900-foot runway, Runway 05/23, that runs northeast to southwest. There are 54 aircraft parking spaces, with a demand of 19 spaces (Fairchild AFB 2014).

Transportation. Transportation infrastructure within and surrounding Fairchild AFB includes the regional network of roads and highways as well as access gates and on-installation roads.

Regional Transportation. Regional access to Fairchild AFB is provided by Interstate 90, U.S. Highway 2, and Washington State Highway 902. Interstate 90 extends east-west through the length of Washington State, entering from Idaho to the east and continuing through the state to Seattle, near Puget Sound.

Traffic information for regional roadways is collected by the Washington Department of Transportation, which collects traffic count data for Washington State. Traffic count data from 2020 is the latest count data available. The entry point for Fairchild AFB, U.S. Highway 2, which provides access to the Main Gate via Mitchell Street, had an annual average daily traffic volume of approximately 15,000 vehicles per day east of Mitchell Street and 9,100 vehicles per day west of Mitchell Street. Washington State Highway 902, which follows along Fairchild AFB's southernmost boundary and provides residents of the City of Medical Lake access to the Thorpe Gate and Rambo Gate during the morning and evening rush hours (i.e., 7:00 a.m. to 8:00 a.m. and 4:00 p.m. to 6:00 p.m.), had an annual average daily traffic volume of 7,500 vehicles per day in 2020 (WSDOT 2021).

The Spokane Transit Authority provides public transportation within the city and includes stops at the installation Exchange/Commissary and Spokane International Airport (STA 2021).

Gate Access. Vehicle access to the installation is provided through three primary gates: Main Gate, Rambo Gate, and Thorpe Gate. The Main Gate is along Mitchell Street off U.S. Highway 2 and is open 24 hours per day. The Rambo Gate is on the eastern side of the installation on South Rambo Road and is operated for commercial vehicles from 6 a.m. to 6 p.m., Monday through Friday, and for DoD badge holders only from 6 a.m. to 8 a.m. (inbound only) and 4 p.m. to 6 p.m. (outbound only). Thorpe Gate is in the southeastern part of the installation and serves personnel working in the southern portion of the installation, as well as personnel living in off-installation communities such as the cities of Cheney and Medical Lake. Thorpe Gate is open 6 a.m. to 8 a.m. (inbound only) and 4 p.m. to 6 p.m. (outbound only) Monday through Friday for DoD badge holders only. With a maximum processing rate of 134 vehicles per lane per hour, the existing five lanes across the three gates providing access to Fairchild AFB operate at capacity (668 vehicles) and at times operate over capacity during peak hours (DAF 2020). Additional gates (i.e., McFarland Gate and Graham Gate) are on the western side of the installation and are used only as contingency gates. Welcome Road and Bartholomew Road gates are on unimproved installation roads but can provide ingress/egress in emergency situations (DAF 2014b).

On-Installation Transportation. The Fairchild AFB transportation system consists of 9.8 million square feet of roadway surfaces. The primary arterial roads moving traffic onto and off the installation are Mitchell Drive, which turns into Bong Street, Arnold Street, Fairchild Highway,

Rambo Road, and Eaker Avenue. All other roads on the installation feed into these primary roads. The main secondary roads include Strategic Air Command Boulevard, West Castle Street, and O'Malley Avenue. Arnold Street provides immediate access to the flightline at Fairchild AFB. Additionally, the installation accommodates pedestrian and bicycle traffic through a network of sidewalks and crosswalks. There are no installation-specific transit facilities; however, a shuttle service provides transportation between Fairchild AFB and Spokane International Airport upon request. Vehicle parking areas are present near all facility and infrastructure project locations. Parking at Fairchild AFB is considered adequate (Fairchild AFB 2014, DAF 2020).

3.4.7.2 Environmental Consequences

3.4.7.2.1 Analysis Methodology

The analysis methodology used to assess impacts on infrastructure and transportation under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.7.2.1**.

3.4.7.2.2 Alternative 2

Potable Water. Short- and long-term, negligible, adverse impacts on the potable water system at Fairchild AFB would be expected from distribution system interruptions and increased demand under Alternative 2. Short-term water supply and distribution system interruptions could be experienced when the new facilities (2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, Installation Deployment Readiness Center, Squad Ops Facility, and Supply Warehouse) are connected to the water supply system, or when facilities need to be disconnected and connected to the installation's water supply system during renovation activities, such as for the Aircraft Maintenance Squadron (AMXS) Buildings and water fill station renovations. Any potential disruptions would be temporary and coordinated with area users prior to disconnection or reconnection to the system. Water necessary for construction would be obtained from the existing water supply and would have a negligible effect on the installation's overall water supply capacity.

Long-term, negligible, adverse impacts on the potable water supply system at Fairchild AFB would occur from the personnel increase associated with Alternative 2. The USGS estimates Spokane County residents use 235 gallons of potable water per day (USGS 2018b). Therefore, the net increase of 992 installation personnel and dependents under Alternative 2 would represent an increase of approximately 233,120 gallons of potable water consumed per day. The average daily water demand at Fairchild AFB would increase from 1.6 mgd to 1.8 mgd, an increase of approximately 13 percent. The new total daily water demand would represent approximately 16 percent of the system capacity of 11 mgd. The increased water demand also would not exceed the supply capacity during periods of peak demand nor the capacity of the Spokane Valley-Rathdrum Prairie Aquifer and Latah (Hangman) Creek Aquifer that feeds the wells from which Fairchild AFB sources its potable water supply.

Electrical System. Short- and long-term, negligible to minor, adverse impacts on the electrical system at Fairchild AFB would be expected from electrical disruptions and increased demand under Alternative 2. Short-term electrical disruptions could occur while buildings are connected to or disconnected from the Fairchild AFB electrical distribution system during construction and

renovation activities required for the facility and infrastructure projects. Any electrical disruptions would be temporary and coordinated with area users prior to the disruption. Electrical utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, minor, adverse impacts on the electrical supply would be expected following the completion of the facility and infrastructure projects associated with Alternative 2. Slight increases in the electrical power usage at Fairchild AFB would occur from the influx of personnel onto the installation and into the surrounding communities, and from electricity requirements at new buildings. New facilities (2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, Installation Deployment Readiness Center, Squad Ops Facility, and Supply Warehouse) would result in a net increase of 315,047 square feet and would require electricity, which would increase the overall energy use at Fairchild AFB. All construction and renovation projects would attain the Leadership in Energy and Environmental Design silver certificate, which would result in energy efficiency and reduced electricity demand compared to older buildings, and potentially influence the source of electricity through the use of alternative energy sources. According to the U.S. Energy Information Administration, the average monthly residential consumption of electricity for customers in Washington State was 969 kilowatt hours (0.969 megawatt hours) in 2020 (USEIA 2021). This information was used to calculate a yearly energy use of approximately 11.6 megawatt hours per customer. Using that number as a residential planning factor, with the assumption each additional personnel would reside in their own household, the additional 338 personnel would increase the region's annual electricity demand by approximately 3,921 megawatt hours. Assuming the additional households would use electricity at the 2020 rate, Alternative 2 would increase the daily electricity demand by approximately 10.7 megawatt hours per day (less than 0.5 megawatt). Therefore, the average electricity demand at Fairchild AFB would increase from 5.3 to 5.8 megawatts, and the new total electricity demand would represent approximately 54 percent of the system capacity of 10.8 megawatts.

Natural Gas System. Short- and long-term, negligible, adverse impacts on the natural gas system at Fairchild AFB would occur from temporary disruptions during construction, demolition, and renovation as well as increased consumption under Alternative 2. Temporary interruptions in natural gas supply could occur when buildings are disconnected from or connected to the natural gas distribution system during construction and renovation activities. Disruptions would be temporary and coordinated with area users beforehand. Natural gas utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, negligible, adverse impacts would occur from the operation of natural gas heating systems for the newly constructed facilities, such as the 2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, Installation Deployment Readiness Center, Squad Ops Facility, and Supply Warehouse. It was conservatively estimated that the new buildings would contain 6.3 million cubic feet of building space in total, increasing the installation's average natural gas demand from 20.7 to 27 million cubic feet of building space. The additional natural gas demand would represent an approximately 30 percent increase in demand. It is anticipated that the natural gas supplier would be able to accommodate the new demand.

Liquid Fuel Supply. Short- and long-term, negligible to minor, adverse impacts on the liquid fuel supply would be expected due to the minimal amounts of petroleum that would be required during construction, demolition, and renovation as well as from the 29 percent increase in aircraft operations under Alternative 2. Petroleum would be brought on site by contractors, and remnant amounts would be removed when construction and renovation activities are complete.

Long-term, minor, adverse impacts on the jet fuel supply at Fairchild AFB would be expected from the 29 percent increase in aircraft operations at the installation, which would require greater quantities of jet fuel when compared with the existing demand. The capacity of the jet fuel storage and distribution system is adequate to handle the increased demand, and Alternative 2 is not expected to result in aircraft refueling delays. Additionally, long-term, minor, beneficial impacts on the liquid fuel system at Fairchild AFB would be expected from the facility and airfield improvement projects, which would expand the fuel hydrant system and increase aircraft refueling capabilities.

Sanitary Sewer and Wastewater. Short- and long-term, negligible, adverse impacts on the wastewater system at Fairchild AFB could occur while buildings are disconnected from or connected to the wastewater system and from increased demand from additional personnel under Alternative 2. Disruptions would be temporary and coordinated with area users prior to construction or renovation activities. Wastewater utilities near the facility and infrastructure projects would be extended to new facilities or facility additions, if required.

Long-term, negligible, adverse impacts on the Fairchild AFB sanitary sewer system would be expected from the personnel increases associated with Alternative 2. Based on a typical individual wastewater generation rate of 50 gpd per person on an 8-hour shift at an industrial facility, the increase of 338 personnel would result in an increase of 16,900 gallons of wastewater per day (DAF 2016). Assuming all personnel and their dependents would live on Fairchild AFB, an additional approximately 57,500 gallons of wastewater would be generated. The average demand of the wastewater system at Fairchild AFB is 0.51 mgd, while the installation is permitted discharge of 2 mgd. The additional personnel and dependents would increase the average wastewater demand to approximately 0.57 mgd, which would be within the permitted limit.

Stormwater System. Short- and long-term, negligible to moderate, adverse impacts on the Fairchild AFB stormwater system would be expected from increased runoff and associated erosion and sedimentation resulting from construction, demolition, and renovation, as well as an increase in impervious surfaces under Alternative 2. Soil disturbance from renovation and construction activities has the potential to temporarily disrupt existing human-made stormwater drainage systems and natural drainage patterns through soil erosion and sediment production. Because construction would disturb more than 1 acre, discharge of stormwater runoff from construction activities must be covered under a NPDES Construction General Permit and authorized by the Washington State Department of Ecology. The permit would require development of a site-specific SWPPP that includes soil erosion and sediment controls, and construction site waste control components.

Long-term, moderate, adverse impacts on the Fairchild AFB stormwater system would be expected from implementation of Alternative 2 due to an increase in impervious surfaces.

Alternative 2 would add 24.5 acres of impervious surfaces. Stormwater control infrastructure, such as culverts, ditches, drains, and piping, would be installed as necessary to control any additional amounts of stormwater runoff and minimize adverse impacts on the stormwater system. Per Section 438 of the EISA, Alternative 2 would implement low-impact development, as appropriate, to help minimize potential increases in stormwater runoff to maintain, to the maximum extent technically feasible, the predevelopment hydrology of the work sites. Additionally, the stormwater system at the sites would be designed to comply with the existing NPDES MSGP for activities on the airfield (i.e., the facility and infrastructure improvements listed in **Table 2-5**), as well as federal, state, and local regulations. If necessary, permit modifications would be implemented to remain in compliance with state stormwater regulatory requirements.

Solid Waste Management. Short- and long-term, negligible to minor, adverse impacts on solid waste management would be expected from increased generation associated with construction, demolition, and renovation as well as additional personnel under Alternative 2. Solid waste generated during construction and renovation activities would consist mainly of building materials such as concrete, metals (e.g., conduit, piping, wiring), lumber, cement, and asphalt; and yard debris such as trees, shrubs, and other vegetation.

To maximize landfill diversion rates, contractors would be required to recycle construction and demolition debris in accordance with applicable federal and installation policies, and would be required to comply with all DAF guidance regarding disposal of debris, as identified in the ISWMP (Fairchild AFB 2021e). Contractors would be responsible for disposal of non-recyclable debris and other special wastes at permitted waste facilities such as the Graham Road Recycling and Disposal Center, which has a remaining permitted capacity of approximately 13,053,000 tons.

Table 3-41 summarizes the solid waste anticipated to be generated during construction and renovation activities. Alternative 2 would generate approximately 13,028 tons of construction and demolition debris. Assuming 70 percent of generated debris would be recycled, in alignment with the installation's construction and demolition debris diversion rate, approximately 3,908 tons of debris would be disposed in landfills, representing less than 0.01 percent of the remaining capacity of the Graham Road Recycling and Disposal Center.

Table 3-41. Estimated Construction and Demolition Debris Generated from Alternative 2

Activity	Total Area (square feet)	Multipliers (pounds/square feet)	Debris Generated	
			Pounds	**Tons**
Facility Renovations	652,671	11.31	7,381,709	3,691
New Facility Construction	315,047	4.34	1,367,304	684
Facility and Airfield Renovations	1,357,553	11.31	15,353,924	7,677
Facility and Airfield Additions	449,714	4.34	1,951,759	976
		Total	**26,054,696**	**13,028**

Source: USEPA 2009

Long-term, negligible, adverse impacts on solid waste management would be expected due to the personnel increases associated with Alternative 2. On average, 4.9 pounds of municipal waste was generated per person per day in 2018 (USGS 2018b). Assuming all personnel and their dependents would produce municipal waste at the 2018 rate, an additional approximately 2.2 tons of waste would be generated per day. Assuming 50 percent of generated debris would be recycled, in alignment with the installation's construction and demolition debris diversion rate, approximately 1.5 additional tons of waste would be disposed at the Spokane Regional Waste to Energy Facility daily. The waste facility has sufficient capacity to accommodate the additional demand.

Communications System. Short-term, negligible, adverse impacts on the communications system at Fairchild AFB would occur from potential disruptions in communications services as new facilities are connected to the existing communications system, such as for the 2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, Installation Deployment Readiness Center, Squad Ops Facility, and Supply Warehouse; or as facilities undergoing renovation are disconnected and reconnected to the existing communications system. Disruptions would be temporary and coordinated with area users prior to construction or renovation activities. Existing copper communications lines would be replaced with new fiber optic communications lines as buildings undergo renovation, and new buildings would be equipped with modern communications systems, resulting in long-term, minor, beneficial impacts.

Airfield. Short-term, minor, adverse impacts on the airfield at Fairchild AFB would be expected from the facility and airfield improvement projects. Construction of additional hangar space and renovation/expansion of airfield pavements would be phased to maximize the availability of apron and ramp space so that airfield operations would not be interrupted, and sufficient aircraft parking would remain available. Long-term, minor, beneficial impacts on the airfield at Fairchild AFB would occur from the addition of an engine-run up area, expansion of the parking apron, and replacement of pavements. Additionally, Fairchild AFB has sufficient aircraft parking space to support the additional aircraft.

Transportation. The anticipated impacts on transportation in the region, local community, and at the installation are summarized below.

Regional Transportation. Short-term, negligible, adverse impacts on the regional transportation and roadway network would occur during construction and renovation activities required for the facility and infrastructure projects. These activities would require the delivery and removal of materials to and from construction and renovation sites at the installation. All construction traffic, including equipment and material deliveries as well as commuting work crews, would enter Fairchild AFB through the Main Gate off U.S. Highway 2, or Rambo Gate along South Rambo Road. No construction or renovation activities would occur beyond the installation perimeter; therefore, impacts to regional roadways would be traffic-related only. Increased traffic on roadways used to access the installation gates, such as U.S. Highway 2 and South Rambo Road would likely result from the daily commutes of contractors and construction crews, delivery of materials, and removal of construction debris.

Long-term, negligible, adverse impacts on regional roadways near the Main Gate, Rambo Gate, and Thorpe Gate, such as U.S. Highway 2, South Rambo Road, and Thorpe Road, could occur

from additional personnel commuting to and from the installation daily; however, the increase in traffic likely would not permanently increase traffic beyond the functionality of any regional roadway. Because Alternative 2 would not affect roadways used for transit services and would not increase traffic beyond the functionality of any regional or on-installation roadway, no impacts on transit services would occur.

Gate Access. Short-term, minor, adverse impacts on the Main Gate and Rambo Gate would occur from the addition of construction traffic during the 2-year transition period, including daily commutes from workers and material hauling, which would increase the number of vehicles accessing the installation daily. It is assumed that construction personnel would commute daily to Fairchild AFB from off-installation. Contractors and construction crews would likely access the installation using the Main Gate, and all commercial vehicles, such as material deliveries, would be required to use the Rambo Gate. The greatest congestion at the installation gates would occur during peak travel time, typically 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. The level of impact on traffic volumes at installation gates would be dependent on construction vehicle routes from the Main Gate and Rambo Gate, frequency of travel, peak times for construction vehicle activity, and length of the construction periods for the facility and infrastructure projects.

For conservative analysis of installation gate operations, it was assumed additional personnel would access the installation once daily. Long-term, minor, adverse impacts on gate access and processing rates would occur from the net increase of 338 personnel at Fairchild AFB. Personnel living off-installation would commute daily to the installation and would access the installation through the Main Gate, Rambo Gate, and Thorpe Gate. Personnel living on-installation would not be anticipated to affect gate traffic or processing rates during peak travel times. The capacity of the three gates is 668 vehicles per hour and, at times, these gates operate over capacity during peak hours. In the case that all 338 additional personnel would access one of the three primary gates at Fairchild AFB once daily, additional traffic may contribute to the likelihood of the gates operating at or over capacity during peak hours, contributing to increased congestion, queueing delays, and travel times. Although most additional commuter traffic would enter and exit the installation during peak travel times, it is likely that some personnel would maintain adjusted working hours and access the primary gates during slower travel times. To reduce the potential for congestion, the installation could adjust the schedule of operations to accommodate the expected increase or provide additional personnel at the gate to process security checks during peak inbound traffic periods, if vehicle processing delays are expected.

On-installation Transportation. Short-term, minor, adverse impacts on the Fairchild AFB transportation and parking network would result from increased contractor-related installation traffic from construction and renovation activities required for the facility and infrastructure projects. Contractors and construction crews would access construction sites daily using the on-installation road network. Construction traffic also would include delivery of materials and removal of debris from project sites. Location of increased traffic and required parking areas would be concentrated on and near the airfield, and within the western portion of the cantonment area. Construction traffic would comprise a small percentage of the total traffic on the installation daily when compared with existing conditions. Some heavy equipment such as bulldozers, loaders, and graders would be left at the construction site or staging area during the

duration of the construction period and would not contribute to daily installation traffic. Partial or full road closures, traffic pattern changes, and detours due to Alternative 2 would be communicated to installation personnel via electronic signs, bulletins, and memorandums. Additional construction traffic at the Fairchild AFB gates would cease once construction activities are completed.

Long-term, negligible, adverse impacts on the Fairchild AFB transportation network would occur from the net increase of 338 personnel transiting on the installation daily. Additional traffic and required parking areas would be concentrated within the cantonment area and near the airfield. Additional on-installation traffic also would occur from associated military dependents and family members using installation roadways. No impacts on pedestrian facilities would occur from Alternative 2.

3.4.8 Land Use

The ROI for the land use analysis is defined in **Section 3.3.8.**

3.4.8.1 Affected Environment

Installation. The 2014 Fairchild AFB IDP describes physical development on the installation and includes a long-range development plan. The IDP details 11 land use categories and 6 planning districts. Existing land use categories include administrative, airfield, aircraft operations and maintenance, community commercial, community service, housing accompanied, housing unaccompanied, industrial, medical/dental, open space, and outdoor recreation. The six planning districts (i.e., administrative, community center, operations and maintenance, training, munitions, and residential) define the primary focus of planning for long-term future growth for that area's specific character (Fairchild AFB 2014, DAF 2020).

The installation is generally organized into five areas of development. At the center, along a northeast-southwest axis, is a 13,900-foot runway, with associated taxiways adjacent to the north connecting to a series of aircraft maintenance structures and mission-related buildings. Land use south of the airfield is primarily designated as industrial and open space. Training and munitions planning districts are on the southern side of the airfield, including the munitions storage activity and the SERE school and training complex. Immediately north of the airfield are aircraft operations and maintenance and industrial land uses. These areas are in the operations and maintenance and training planning districts. Farther north, more mixed land use categories are present, including community commercial, community service, industrial, open space, outdoor recreation, and residential. These areas are in the administrative, community center, and residential planning districts. The land uses within Fairchild AFB are generally compatible, except for the elementary school that is located adjacent to fuel storage tanks. Future development on the installation is likely to consolidate and upgrade current functions and not change existing land uses (Fairchild AFB 2014, DAF 2020).

The proposed facility construction, demolition, and renovation projects would primarily fall within the airfield, aircraft operations and maintenance, and community service land use categories; the Supply Warehouse and Flight Simulator/FUT Complex would occur within the open space land use category; and the Squad Ops Facility (Two KC-46A ANG Squadrons) would occur with the administrative land use category. Land use categories adjacent to the Project Area are

similar, but also include outdoor recreation and industrial land use categories. The Project Area falls within the operations and maintenance planning district. This district includes the airfield, runway, and most of the mission-support functions. The existing development is organized in a pattern that is typical of a flightline surrounded by its support and maintenance facilities (Fairchild AFB 2014).

The Fairchild AFB *Final Land Use Controls Implementation Plan* details the 16 ERP sites with LUCs in place at Fairchild AFB, and documents the processes used to implement, monitor, maintain, and enforce remedies that protect human health and the environment in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act and the National Contingency Plan. No MMRP sites occur within the Project Area. Two ERP sites coincide with the Project Area (SS-039 and TU-500), and additional ERP sites are in the surrounding area. Both ERP sites are subject to LUCs that restrict on-installation usage of contaminated groundwater. An additional LUC for TU-500 restricts the disturbance of contaminated soil (Fairchild AFB 2019a). Refer to **Section 3.4.9.1** for additional details on these ERP sites.

Fairchild AFB's Air AICUZ program provides guidelines for compatible land use within CZs, APZs I and II, and NZs ranging from 65-dBA DNL to greater than 80-dBA DNL (Fairchild AFB 2007). No schools, churches, hospitals, nor noise sensitive areas are within the existing CZs, APZs, or NZs. Review of aerial imagery and the Fairchild AFB IDP indicates that no on-installation residences are within the 65-dBA DNL contour (Fairchild AFB 2014). Refer to **Figure 3-10** and **Section 3.4.1.1** for more information on the existing noise environment on Fairchild AFB.

Surrounding Areas. The lands immediately surrounding Fairchild AFB comprise the unincorporated (or, not self-governed) communities and lands of the West Plains in Spokane County (City of Spokane 2014, Fairchild AFB 2014). This area lies between the installation and other surrounding cities in Spokane County (Airway Heights, Medical Lake, Spokane, and Cheney). The closest of these cities to the installation are Airway Heights (approximately 0.5 mile east-northeast) and Medical Lake (approximately 1 mile southwest). Agriculture is the dominant land use within Spokane County's unincorporated areas and the West Plains area adjacent to Fairchild AFB, with large areas west and southeast of the installation devoted to grain production or maintained as open rangeland. Land uses surrounding the installation are also primarily agricultural, with a few commercial, industrial, and residential areas. Residential land uses adjacent to the installation consist of large-lot, low-density residential parcels that are 3 to 10 acres in size (Fairchild AFB 2014, Spokane County 2020a).

Land uses surrounding Fairchild AFB are generally compatible with the installation's mission. The area surrounding the installation is expected to experience some continued economic and population growth (Fairchild AFB 2014, Spokane County 2020b). Growth in the county is managed in accordance with the *Growth Management Act* as specified in *Revised Code of Washington* Chapter 36.7A. The Growth Management Act mandated the establishment of Urban Growth Areas, which maintain the boundary between rural and urban land uses while providing adequate space for projected growth over the next 20 years. The *Spokane County*

Comprehensive Plan outlines policies for protecting Fairchild AFB from encroachment of incompatible land uses. These policies include (but are not limited to) the following:

- Encourage the protection of Fairchild AFB from land uses and/or activities that could adversely affect present and/or future operations
- Encourage the use of special plans, planned unit developments, or techniques within existing residential areas to help minimize conflicts and enhance compatibility between Fairchild AFB and new land uses
- Do not permit increases in residential densities, expansion of residential zones, establishment of new residential areas, or the reclassification of commercial or industrial areas as residential areas within the 65-dBA DNL noise contour
- Do not permit noise-sensitive uses that have a high concentration of people (e.g., schools, religious institutions, theaters, public assembly facilities, day care facilities) and non-residential uses with net densities exceeding 180 persons per acre within the 65-dBA DNL noise contour (Spokane County 2020b)

In addition to the *Spokane County Comprehensive Plan*, land use planning for the West Plains is achieved via the Comprehensive Plans for the cities within Spokane County; the 2014 *West Plains Transportation Subarea Plan*; the *West Plains Development Code*; and the 2009 Fairchild JLUS. These plans were developed, in part, to identify compatible land uses and growth management guidelines near the installation (City of Spokane 2014, Spokane County 2020b). As recommended in the JLUS and in the Spokane Tribe of Indians' *West Plains Mixed-Use Development Project* EIS, the Tribe enacted the *West Plains Development Code* to implement measures for restricted building heights; reduced density, noise, light, and glare; and limitation of wildlife attractants for the Spokane Tribe of Indians hotel and casino that is located immediately northeast of the installation (Spokane County 2009, USBIA and Spokane Tribe of Indians 2013, Fairchild AFB 2012). Spokane County, the City of Spokane, and the City of Airway Heights similarly revised their land use ordinances to implement JLUS recommendations (DAF 2018b).

As discussed in the 2007 Fairchild AFB AICUZ Study, the DAF provides recommendations and guidelines for compatible land uses to local jurisdictions through the AICUZ program. The DAF has restrictive easements on privately and publicly owned land adjacent to Fairchild AFB within the CZs to protect against incompatible uses. Existing airfield operations and installation land use are generally compatible with adjacent land uses (Fairchild AFB 2014). The 2007 Fairchild AFB AICUZ Study identified incompatible residential and public use lands within the northern APZ II. Areas in the West Plains fall within the 65-dBA DNL noise contour (see **Table 3-42**). Review of aerial imagery and the zoning map for the City of Airway Heights indicate that no noise-sensitive land uses exist within these areas of operational noise exposure (Fairchild AFB 2007, City of Airway Heights 2021). Refer to **Section 3.4.1.1** for more information on the existing noise environment in the areas surrounding Fairchild AFB.

Table 3-42. Off-Installation Acreage Within Fairchild AFB AICUZ

AICUZ	Off-Installation Acreage[a]
CZ[b]	175
APZ I	689
APZ II	964
60–64 dBA DNL NZ	12

[a] Acreage values are not additive because CZs and APZs overlap with NZs.
[b] No residential areas are within the CZ.
Key: CZ = Clear Zone; dBA = "A" Weighted Decibel; APZ = Accidental Potential Zones; DNL = day-night average sound level; NZ = Noise Zone

The *Spokane County Zoning Code, Chapter 14.700, Airport Overlay Zones* (AOZs) implements development restrictions near airports through identification of AOZs. The AOZ Program is similar in design and intent to the AICUZ Program. The Spokane County Zoning Code effectively implements FAA-regulated APZs to identify areas and restrict land uses within Spokane communities immediately adjacent to Fairchild AFB and other airports, where the greatest potential for aircraft accidents exists (Spokane County 2009, 2020c).

3.4.8.2 Environmental Consequences

3.4.8.2.1 Analysis Methodology

The analysis methodology used to assess land use impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.8.2.1**.

3.4.8.2.2 Alternative 2

No impacts on land use from the addition of personnel and dependents at Fairchild AFB would occur. Personnel and dependents would be housed in existing residential areas both on- and off-installation. Existing installation childcare, housing, fitness, medical, and dining facilities and services would support the proposed 24 KC-46A PAA personnel, family members, and dependents.

Installation. Short- and long-term, negligible to minor, adverse impacts would be expected from increased noise and potentially constrained access of nearby facilities due to construction, demolition, and renovation actions and requirements to temporarily fence areas for public safety. Long-term, minor, adverse noise impacts on land use would be anticipated from the increase in aircraft training operations. Long-term, minor, beneficial impacts on installation land use would be expected from more efficient use of land under Alternative 2. Short-term, minor, adverse impacts would result from temporary increases in noise levels during construction, demolition, and renovation. The associated noise levels would not result in areas of incompatible land use or preclude the viability of the existing land uses. Refer to **Section 3.4.1.2** for additional information on potential impacts from construction noise under Alternative 2. Additional short-term adverse impacts would occur from a temporary reduction in facility, airfield ramp, and hangar availability during construction, demolition, or renovation. These impacts would be negligible because phased use of these resources would allow construction to occur in support of the 24 KC-46A PAA, and facilities would remain in use during renovations, resulting in minimal disruptions to ongoing operations. No impacts on land use from ground disturbance or operations in ERP sites would occur because Fairchild AFB would adhere to the appropriate

LUCs during construction, demolition, and operations. The construction contractor would develop BMPs in accordance with site-specific LUCs (e.g., access, digging, groundwater contact restrictions) and would obtain all necessary permits prior to ground disturbance (Fairchild AFB 2019a). Refer to **Section 3.4.9.2** for additional information on potential impacts from the proposed activities within ERP sites.

Long-term, minor, adverse impacts would occur due to the proposed 29 percent increase in aircraft operations that would expand the NZ area on the installation (see **Figure 3-11**). Although noise levels and the frequency of intermittent noise events would increase, Alternative 2 would not affect the airfield and the aircraft operations and maintenance planning district that currently experiences high levels of noise and occur within the existing 65-, 70-, and 75-dBA DNL noise contours. Construction or renovation projects within the proposed NZs would include acoustical design considerations for façade elements and interior design requirements (per UFC 3-101-01), as appropriate. No existing residences or other noise-sensitive receptors on the installation would occur within the NZs under Alternative 2. While sensitive receptors are outside the proposed NZs, they would continue to be exposed to frequent aircraft operations noise due to their proximity to the airfield. Additionally, the Fairchild AFB Hospital and one on-installation housing location could experience eight potentially sleep disturbing events per year and an increase in outdoor speech interference events. Therefore, adverse impacts on land use would be minor. Refer to **Section 3.4.1.2** for additional information on noise impacts under Alternative 2.

Long-term, minor, beneficial impacts would occur because most of the proposed construction, demolition, and renovation projects would result in an efficient use of installation land and would not conflict with existing or future uses on the installation, except for the Supply Warehouse and Flight Simulator/FUT Complex. Facility construction and renovation would consolidate like functions and increase efficiency, and facility demolition would remove outdated and underused facilities or portions of facilities. Most of the proposed projects would be compatible with the existing and future land use categories as well as the planning districts identified in the Fairchild AFB IDP (Fairchild AFB 2014). Additionally, none of the proposed facilities would occur within the CZs or APZs. Although the proposed Supply Warehouse and Flight Simulator would be incompatible with the existing open space land use designation, the Future Land Use Plan in the Fairchild AFB IDP states that the area will be re-classified as an industrial land use area that would then be compatible with the proposed facilities.

Surrounding Areas. No impacts from the proposed construction, demolition, or renovation projects on off-installation land use would be expected because Fairchild AFB has the physical real estate and infrastructure required to beddown the 24 KC-46A PAA and would not need land outside the installation boundaries. The temporary increases in noise levels during construction, demolition, and renovation would not impact off-installation areas.

Long-term, minor, adverse impacts on off-installation land use would result from the increase in aircraft operations noise following the increase in operations by 29 percent. The off-installation area within the 60–64 dBA DNL NZ would increase from 12 to 65 acres. Land uses in the newly exposed areas within the West Plains (immediately adjacent to the installation) are primarily agricultural or undeveloped, with some mining and industrial general land uses interspersed,

and are compatible with the proposed operational noise levels. No existing off-installation residences or other noise-sensitive receptors would be located within the NZs under Alternative 2. Although outside of the proposed NZs, residents of the northeastern portion of Medical Lake (south of the installation) and the northwestern portion of Airway Heights (east of the installation), including the Spokane Tribe of Indians hotel and casino, could notice an increase in intermittent noise events that could temporarily and briefly disrupt residential, commercial, and recreational uses. The communities surrounding Fairchild AFB, including those within and outside the proposed NZs, are currently exposed to aircraft operations noise due to their proximity to the installation. Therefore, adverse impacts on land use would be minor.

3.4.9 Hazardous Materials and Waste

The ROI for the hazardous materials and wastes analysis is defined in **Section 3.3.9.**

3.4.9.1 Affected Environment

Hazardous Materials, Petroleum Products, and Hazardous Wastes. Fairchild AFB uses hazardous materials and petroleum products such as liquid fuels, aircraft deicer, pesticides, and solvents for everyday operations. The use of these hazardous materials and petroleum products results in the generation and storage of hazardous wastes and used petroleum products on the installation. Fairchild AFB is a RCRA Large Quantity Generator with facility identification number WA9571924647 (DAF 2020). Within the Project Area, hazardous materials, hazardous wastes, and petroleum products are used and generated at Buildings 1017, 2007, and 2050 (Fairchild AFB 2021c).

Fairchild AFB operates two Type III jet fuel hydrant systems on the aircraft parking ramp and uses multiple ASTs for the bulk storage of jet fuel. The total jet fuel storage capacity of Fairchild AFB is approximately 4.6 million gallons. The installation also operates four 12,000-gallon ASTs for the storage of deicing fluid. Fairchild AFB runs a POLs laboratory, which distributes hazardous materials and collects hazardous wastes from customers on the installation (Fairchild AFB 2014, DAF 2018a).

Fairchild AFB has installation-specific hazardous materials and hazardous waste management plans, as well as shop-specific spill prevention and response plans. These plans define roles and responsibilities, address record keeping requirements, and provide spill contingency and response requirements with regards to management of hazardous materials and wastes (Fairchild AFB 2020b, Fairchild AFB 2021f).

Toxic Substances. Known ACMs on Fairchild AFB are managed in accordance with the installation's asbestos management plan and through a database that holds detailed information on surveys and abatement actions. The plan provides documentation for all asbestos management efforts and procedures for overseeing the Fairchild AFB asbestos management program. The plan assigns responsibilities, establishes inspection and repair processes, and provides personnel protection instructions. Known ACMs that do not require immediate abatement are managed in-place until conditions require their removal, or until renovation or demolition activities occur (Fairchild AFB 2021g). Surveys of Fairchild AFB have identified ACMs in Buildings 2050 and 2097, but did not identify ACMs in Building 2007 (Fairchild

AFB 2021h). All the facilities to be renovated or expanded could potentially contain asbestos (ATSDR 2022).

Thhe installation's lead exposure and LBP management plan provides guidance on how to protect DAF personnel and the public from exposure as well as the management and disposal of LBP (Fairchild AFB 2016). Surveys of Fairchild AFB have identified LBP in Buildings 2050 and 2097, but did not identify LBP in Building 2007 (Fairchild AFB 2021h). Buildings 1003, 1013, and 1017 have not been surveyed for LBP, but could contain LBP because they were built before 1978. Buildings 1003, 1013, 1017, 2050, and 2097 also have the greatest potential to contain PCBs in building materials because they were built before 1979. Older electrical infrastructure, such as light fixtures and surge protectors, within these buildings might also contain PCBs.

In addition to ACMs and LBP, surveys of Building 2050 also identified cadmium, chromium, and lead in excess of acceptable threshold limits on the exterior roof deck area (Fairchild AFB 2021h).

Environmental Contamination. Fairchild AFB was listed on USEPA's National Priorities List in March 1989, which indicates that it is considered a site of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States (USEPA 2022g). Fairchild AFB has a Comprehensive Environmental Response, Compensation, and Liability Act Federal Facility Agreement that was entered into in 1990 between the DAF, USEPA Region 10, and the Washington Department of Ecology. As of 2022, a total of 18 active ERP and 3 MMRP sites occur on the installation (Fairchild AFB 2022). This EIS focuses only on those ERP sites that have the potential to be impacted by Alternative 2. ERP sites that require no further action, do not directly coincide with the Project Area, or would not be impacted by the proposed activities are not evaluated further. No MMRP sites overlap with the Project Area (Fairchild AFB 2014). The three ERP sites that occur within the Project Area are described below, and the projects that coincide with the sites are outlined in **Table 3-43** and **Figure 3-20**.

Table 3-43. ERP Sites within the Fairchild AFB Project Area

Project	ERP Site
Facility Renovations	
KC-46A AMXS and Two AMUs; Building 2090	None
KC-135 AMXS and Two AMUs; Building 2097	SS039
Squad Ops Facility (Two KC-46A Active Duty ARSs); Building 2005	SS039, PFAS Contamination (aircraft accident site)
Squad Ops Facility (Two KC-135 Active Duty ARSs); Building 2007	SS039
4-Bay Hangar with Backshops; Building 2050	SS039
DASH-21, AME, ATGL, Seat Pallet, Engine Storage; Building 1003	TU500 (OW042, TU501)
AGE MX; Building 1013	SS039
KC-46A CTK; Building 1017	SS039
Enclosed Water Fill Station for Deicing Operations	TU500 (TU504)
New Facility Construction	
2-Bay Fuel Cell and Wash Rack Hangar with Backshops	SS039, PFAS Contamination (aircraft accident site)
Mission Planning Center	SS039, PFAS Contamination (aircraft accident site)
Installation Deployment Readiness Center	TU500 (OW040)
Squad Ops Facility (Two KC-46A ANG Squadrons)	SS039
Supply Warehouse	SS039, OW058
Facility and Airfield Improvements	
Flight Simulator Facility/FUT Complex	None
Parking Apron and Hydrant Fuel System Expansion	TU500 (Buildings 1012 and 1019)
Engine Run-Up Area	SS039

Source: Fairchild AFB 2019a
Key: ERP = Environmental Restoration Program; AMXS = Air Maintenance Squadron; AMU = Aircraft Maintenance Unit; ARS = Air Refueling Squadron; AME = Alternate Mission Equipment; ATGL = Air Transportable Galley/Lavatory; AGE = Aerospace Ground Equipment; MX = Maintenance; CTK = Consolidated Tool Kit; ANG = Air National Guard; FUT = Fuselage Training; PFAS = per- and polyfluoroalkyl substances

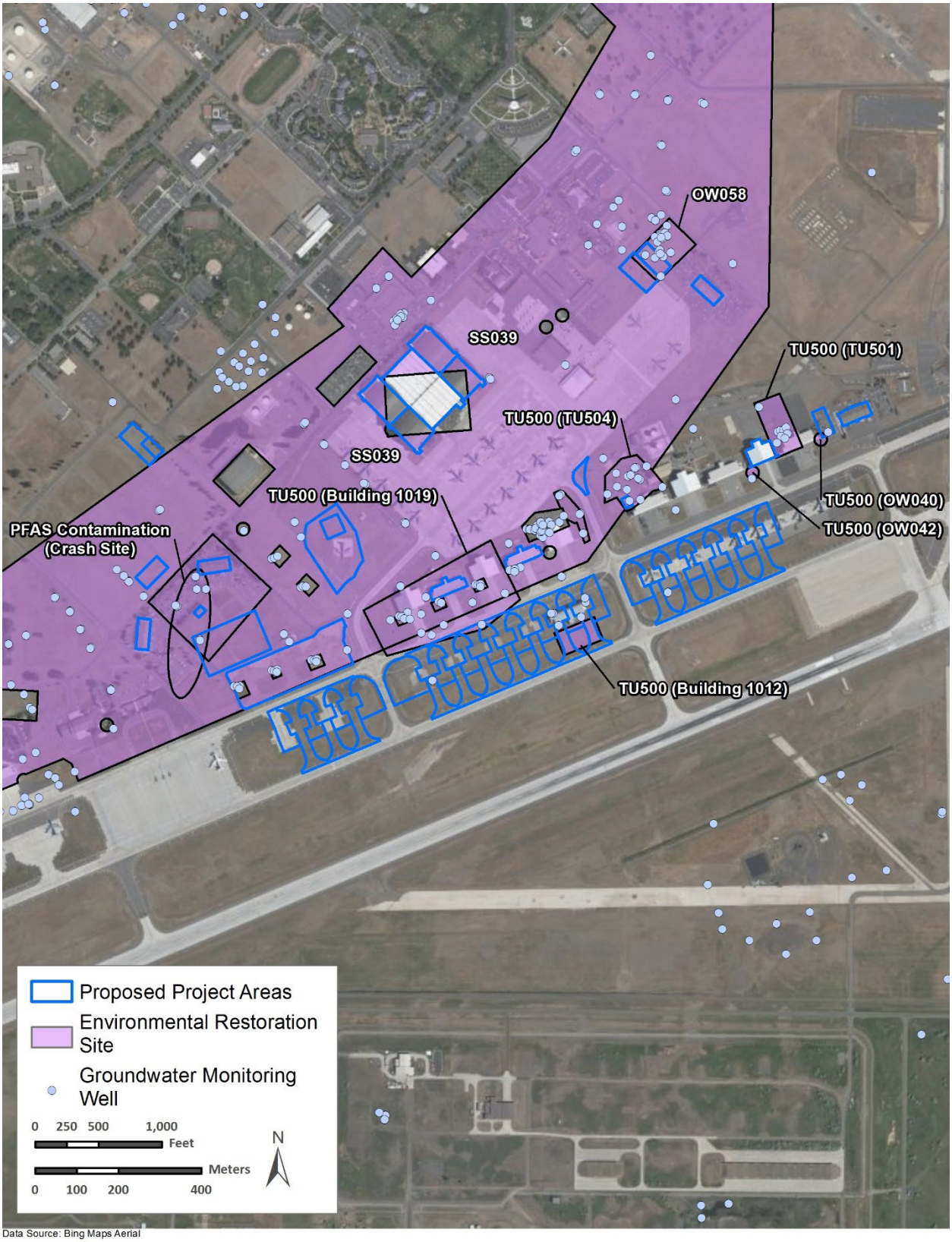


Figure 3-20. ERP Sites and Groundwater Monitoring Wells in the ROI at Fairchild AFB

OW058. This site consists of hydrocarbon-contaminated soil and groundwater, and is located on the southwestern corner of the intersection of Ordnance Road and Hansell Avenue. The contamination is thought to be associated with the operation of a former fuel supply station at Building 2094. Building 2094 operations were supported by two USTs, fuel dispensers, piping, and a vault where piping connections were located. One of the USTs was a 3,000-gallon, single-wall, steel, gasoline tank that was originally used for storing missile fuel (ammonia) before being converted for gasoline storage in the mid-1970s. The other 4,000-gallon, single-wall, steel, diesel UST was installed in 1974 when Building 2094 was used as a military fuel supply station. The tanks, vault, and piping connections at Building 2094 were removed in 1995.

SS039. This site consists of chlorinated solvent and hydrocarbon-contaminated groundwater plumes extending across the installation over an area approximately 3 miles long and 0.33-mile wide. In situ groundwater treatment has occurred, and the site is currently undergoing additional remedial action in accordance with the 2011 Interim ROD. Annual groundwater monitoring is in place to verify the plume will dissipate (Fairchild AFB 2022). Additionally, LUCs at the site prohibit the use of groundwater from within the site (Fairchild AFB 2019a).

TU500. This site consists of hydrocarbon and heavy metal-contaminated soil and groundwater that is located primarily within the eastern portion of the flightline. TU500 is composed of multiple sites that were previously investigated separately, including the following sites within the Project Area: TU501, TU504, OW040, OW042, Building 1012, and Building 1019.

Contamination at TU501 is associated with a 25,000-gallon UST that stored jet propellant-4 fuel, while contamination at TU504 is associated with a 250-gallon waste fuel UST. Both USTs have been removed. Contamination at OW040 and OW042 are associated with OWSs that received waste such as used fuel/oil, lubricants, and possibly solvents. Contamination at Buildings 1012 and 1019 is also associated with OWSs that received wastes, including used fuel/oil, lubricants, and solvents. The OWSs were removed in 1995.

Interim measures to clean-up contaminated soils at OW040 and OW042 are outlined in the 2019 *Final Voluntary Cleanup Program Consolidated Site TU500 Interim Measure Work Plan* (Fairchild AFB 2019b). Currently, contamination at the remaining TU500 sites within the Project Area are being addressed under selected remedies that include natural attenuation and/or LUCs. LUCs that are applicable to each site restrict usage of contaminated groundwater and disturbance of contaminated soil. Additional remedial actions will be developed in a pending feasibility study (Fairchild AFB 2019b).

PFAS. PFOA and PFOS were detected in DAF monitoring wells along the southeastern and northern perimeter of Fairchild AFB at levels above the 2016 USEPA health advisory level of 70 parts per trillion. Additionally, contaminated soil and groundwater from PFOA and PFOS have been identified in five locations across Fairchild AFB. The proposed 2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, and the Squad Ops Facility (two KC-135 Active Duty ARSs) occur within one of these sites, which was the location of an aircraft accident. PFOA and PFOS have also been detected above the 2016 USEPA health advisory levels in nearby off-base residential wells and a City of Airway Heights municipal well. The DAF is performing additional sampling and investigation.

Radon. USEPA rates Spokane County, Washington, as Radon Zone 1. Counties in Zone 1 have a predicted average indoor radon screening level greater than 4 pCi/L (USEPA 2022h), which is above the USEPA established guidance radon level of 4 pCi/L in indoor air for residences.

3.4.9.2 Environmental Consequences

3.4.9.2.1 Analysis Methodology

The analysis methodology used to assess impacts on or from hazardous materials and wastes under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.9.2.1**.

3.4.9.2.2 Alternative 2

Hazardous Materials, Petroleum Products, and Hazardous Wastes. Short- and long-term, minor, adverse impacts would occur from the increased use of hazardous materials and petroleum products; generation of hazardous wastes during construction, demolition, and renovation; and KC-46A operations under Alternative 2. Hazardous materials that could be used include paints, welding gases, solvents, preservatives, and sealants. Additionally, hydraulic fluids and petroleum products, such as diesel and gasoline, would be used by the heavy vehicles and equipment. Onsite storage of petroleum products for construction, renovation, and demolition would be accomplished through the installation of temporary diesel and gasoline ASTs, as necessary. These ASTs would be removed following the completion of construction, renovation, and demolition. Construction, demolition, and renovation would generate negligible quantities of hazardous wastes. These quantities would not be expected to exceed the capacities of the existing hazardous waste disposal streams on Fairchild AFB. Contractors would be responsible for the disposal of hazardous wastes in accordance with federal and state laws and the Fairchild AFB hazardous waste management plan. All hazardous materials, petroleum products, and hazardous wastes used or generated during construction would be contained, stored, and managed appropriately (e.g., secondary containment, inspections, spill kits) in accordance with applicable regulations and SPCC Plans to minimize the potential for releases. All construction equipment would be maintained according to the manufacturer's specifications, and drip mats would be placed under parked equipment as needed. Hazardous materials, hazardous wastes, and petroleum products currently within the affected portions of Buildings 1017, 2007, and 2050 would be relocated to similar facilities or properly disposed to accommodate building renovation.

Long-term, minor, adverse impacts would occur from the increased use of hazardous materials and petroleum products and the generation of hazardous wastes following the beddown of 24 KC-46A PAA due to the 29 percent increase in aircraft operations. Increased quantities of jet fuel and aircraft deicing fluid would be delivered to and used at Fairchild AFB. The installation would store up to 1.2 million gallons of fuel and dispense it through a Type III hydrant system. The installation's existing fuel storage and delivery infrastructure has sufficient capacity for this throughput. The proposed additions to the hydrant fuel system would support the specialized configuration of the KC-46A PAA.

Additional deicing fluid would be required under Alternative 2 because approximately 150 gallons of undiluted deicing fluid would be used per aircraft deicing operation. The proposed

water fill station would support KC-46A deicing operations, which would generally occur in the same manner and would continue to use the installation's other existing aircraft deicing infrastructure. No new deicing fluid storage tanks would be constructed as the installation's existing deicing ASTs have sufficient capacity. Deicing would continue to occur on the parking ramp in accordance with installation processes and procedures. Waste deicing fluid would be recaptured (vacuumed from the pavement via a Glycol Recovery Vehicle) and recycled. Aircraft deicing is anticipated to occur regularly at Fairchild AFB.

An increase in aircraft maintenance would be likely as a result of increased flight operations, which would require the use of a greater amount of hazardous materials and increased generation of hazardous wastes. The quantities of these hazardous materials and hazardous wastes would be similar to those used or generated by existing aircraft maintenance operations and would be managed by the Fairchild AFB POLs laboratory. Hazardous materials storage and hazardous waste collection points would be added as necessary. The use of hazardous materials and/or petroleum products and the generation of hazardous wastes would continue at Building 1017 (KC-46A Consolidated Tool Kit [CTK]), Building 2007 (two KC-135 Active Duty ARSs), and Building 2050 (4-Bay Hangar with Backshops) due to the activities that would occur in these facilities under Alternative 2. Although the two KC-135 Active Duty ARSs within Building 2007 would serve administrative purposes, the storage of flight crew equipment could also occur within the building. The use of hazardous materials and/or petroleum products and the generation of hazardous wastes could occur at Building 2090 (KC-46A AMXS and two AMUs), Building 2097 (KC-135 AMXS and two AMUs), Building 1003 (DASH-21, AME, ATGL, Seat Pallet, Engine Storage), Building 1013 (AGE MX), the 2-Bay Fuel Cell and Wash Rack Hangar with Backshops, the Supply Warehouse, and the Flight Simulator Facility/FUT Complex. The Fairchild AFB hazardous materials and hazardous waste management plans would be amended for any new hazardous materials, hazardous waste, or petroleum product capabilities. Additionally, shop-specific spill prevention and response plans would be developed as needed. These plans would continue to be followed to lessen the potential for a release and provide spill contingency and response requirements. The potential for contamination to occur would be further minimized through the use of secondary containment for the storage of petroleum products.

Toxic Substances. Short-term, minor, adverse impacts from toxic substances would occur during facility demolition and renovation because these activities could disturb ACMs, LBP, and PCBs in the facilities, or facility components, to be renovated or removed. Surveys for toxic substances would be completed, as necessary, by a certified contractor prior to work activities to ensure that appropriate measures are taken to reduce potential exposure to, and release of, these toxic substances. Contractors would wear appropriate PPE and would be required to adhere to all federal, state, and local regulations as well as the installation's management plans. When necessary, additional precautions would be taken during the renovation of Building 2050 due to the presence of cadmium, chromium, and lead in excess of acceptable threshold limits on the exterior roof deck area. All ACM- and LBP-contaminated debris would be disposed at an USEPA-approved landfill. New building construction would not include the use of these toxic substances because federal policies and laws prevent their use, and building materials that do not contain these substances are available. Long-term, beneficial impacts would occur from

reducing the potential for future human exposure to these toxic substances by reducing the amount of ACMs, LBP, and PCBs to maintain at Fairchild AFB.

Environmental Contamination. Short-term, minor, adverse impacts would occur because some facility construction, demolition, and renovation would coincide with active ERP sites (see **Table 3-43** and **Figure 3-20**). Prior to the start of any construction, demolition, or renovation that would result in ground disturbance, the DAF would coordinate with the Fairchild AFB ERP office to ensure that ground disturbance is coordinated with ongoing remediation and investigation activities. The ERP office would ensure necessary consultation and coordination is completed with the USEPA and Washington State Department of Ecology, as required. ERP sites OW058, SS039, and TU500 include areas of groundwater contamination; therefore, contractors would take appropriate groundwater control measures should ground disturbance reach the depth of groundwater, including regular cleaning of floors and ground surfaces around the disturbance, use of secondary containment, and use of dry solvents to collect spills. The proposed facilities would not impair the ability to monitor the ERP sites within the Project Area because any existing groundwater monitoring wells or treatment systems would be protected or relocated during ground-disturbing activities associated with Alternative 2. OW058 and TU500 also contain areas of soil contamination above residential limits. The Fairchild AFB ERP office would identify these areas to contractors so that appropriate safety precautions could be taken for workers during construction. Future remediation of soil contamination planned for TU500 (specifically, at the sites previously known as OW040 and OW042) would move forward. Additionally, contractors would develop BMPs in accordance with site-specific contamination (e.g., access, digging, groundwater contact restrictions) and would obtain all necessary permits prior to ground disturbance. Proper characterization, handling, and disposition procedures for contaminated groundwater and soils would be followed.

Contractors performing ground-disturbing activities could encounter undocumented soil or groundwater contamination. If soil or groundwater that is believed to be contaminated was discovered, the contractor would be required to immediately stop work, report the discovery to the installation, and implement appropriate safety measures. Commencement of field activities would not continue in this area until the issue was investigated and resolved. The unexpected discovery of unexploded ordnance is unlikely due to the distance of the Project Area from MMRP sites and proximity to previously disturbed ground.

No long-term impacts would occur from operations within the ERP sites because operation of the proposed facilities would not conflict with the LUCs (e.g., restrictions against usage of contaminated groundwater and disturbance of contaminated soil) at these ERP sites.

PFAS. Short-term, minor, adverse impacts would occur because some facility construction would coincide with a PFAS-contaminated area (see **Table 3-43** and **Figure 3-20**). Construction of the 2-Bay Fuel Cell and Wash Rack Hangar, Mission Planning Center, and Squad Ops Facility (two KC-135 Active Duty ARSs) are likely to coincide with soil and groundwater contamination resulting from historic PFOA and PFOS releases. Construction within the footprint of PFOA and PFOS soil contamination would be subject to environmental requirements for the handling and disposition of the groundwater and soil. This construction would be coordinated with the Fairchild AFB ERP office, which would ensure necessary environmental

regulatory consultation and coordination occurs. No impacts on the use of these proposed facilities would be expected because PFOA and PFOS have low potential for vapor intrusion.

Radon. Long-term, minor, adverse impacts from radon are possible due to construction and operation of new and renovated facilities under Alternative 2. Based on the USEPA rating of Radon Zone 1 for Spokane County, it is possible the new and renovated facilities could have indoor radon screening levels greater than 4 pCi/L. Although basements and poorly ventilated areas are most commonly affected by radon, any indoor space in contact with the ground (i.e., first floor of a slab building) is at risk. Radon could be managed in new construction by incorporating passive features into the design that limit the ability for radon to enter the building. These features could include placing aggregate material and matting below the concrete floor to encourage lateral, rather than vertical, flow of soil gas; designing the HVAC system to avoid depressurization of the first floor; and using airtight seals around pipes and wires where they protrude from below grade. Periodic radon testing would occur as needed in each new and renovated building. Post-construction radon management measures, such as installing ventilation systems to remove radon that has already entered the building, would be installed in buildings that test higher than 4 pCi/L.

3.4.10 Health and Safety

The ROI for the health and safety analysis are defined in **Section 3.3.10**.

3.4.10.1 Affected Environment

Flight Safety. A total of three Class A aircraft mishaps (e.g., crashes or crash landings) involving KC-135s have occurred on or near Fairchild AFB in 1962, 1967, and 1987 (ASN 2022b). A fourth Class A mishap occurred on the installation in 1994, when a B-52 assigned to Fairchild AFB crashed near the runway because of pilot error while rehearsing maneuvers for an air show.

The Spokane, Washington, area receives approximately 4 feet of snow and has several months of freezing temperatures every year (U.S. Climate Data 2022). Therefore, deicing aircraft is essential to maintaining operational success and personnel safety on Fairchild AFB. The 92nd Logistics Readiness Squadron stores the installation's de-icing fluid volume in four 12,000-gallon storage tanks. Deicing fluid storage tanks are adjacent to the jet fuel bulk storage area.

Bird/Wildlife-Aircraft Strike Hazard at Fairchild AFB and Vicinity. Most bird strikes at Fairchild AFB occur between April and May, and November and December, and the majority of bird strikes occur in the traffic pattern. Between 2002 and 2007, the 92 ARW experienced an average low of fewer than one strike in January to more than nine in September (92 ARW 2010). As discussed in **Section 3.4.2**, Fairchild AFB is in a migration flyway for migratory birds, particularly for Canada geese in summer. Ducks, pigeons, starlings, and red-tailed hawks pose the biggest threat to aircraft operations at Fairchild AFB. Coyotes, badgers, and deer are the most common mammal species involved in wildlife aircraft strikes on the installation (Fairchild AFB 2018).

The *92d/141st Air Refueling Wing (92 ARW/141 ARW) Bird/Wildlife Aircraft Strike Hazard (BASH) Plan 91-212* (2021), which is implemented in two phases, provides specific guidance

and assigns responsibilities in developing an effective bird/wildlife-aircraft strike hazard reduction program for the Fairchild AFB local flying area (Fairchild AFB 2021a). This plan also provides guidance to aircrews while off-installation. Phase I concentrates on bird control and dispersal and is in effect year-round. Phase II, which concentrates on bird avoidance through scheduling and airfield operating restrictions, is typically implemented during the spring and late fall seasonal migration periods (i.e., April through May and November through December, when the potential for and frequency of bird strikes is greatest). Historical bird strike data provide the basis for when Phase II is to be implemented.

Occupational Safety. Occupational/operational safety at Fairchild AFB is maintained through adherence to federal, DoD, and DAF safety policies and plans.

Weapons/Public Safety. ESQD arcs cover a significant portion of land at Fairchild AFB, primarily on undevelopable land because of its location within primary airfield surfaces and/or CZs. Fairchild AFB is managing its development program to ensure that it meets explosive safety requirements. Currently, no electromagnetic radiation safety zones, antenna look-angles, or security CZs affect development on Fairchild AFB (Fairchild AFB 2014).

DAF policy requires privately owned land within CZs to be acquired by the DAF via a fee simple easement or a restrictive land easement. Accordingly, Fairchild AFB has established easements for all off-installation land within both CZs. Runway 05/23 at Fairchild AFB has CZs encompassing an area 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long, and APZ II is 3,000 feet wide by 7,000 feet long. Additionally, as detailed in **Section 3.4.8**, Spokane County has developed and implemented AOZs to reduce the potential for airport hazards that apply to airports in the county, including Fairchild AFB. The AOZ program is similar in design and intent to the DoD's AICUZ program. The AOZ establishes guidelines for development around the designated airports and has a process for how applications for development are handled (Spokane County 2009, 2020c).

No incompatible developments are currently located within the installation's CZs. The government owns most of the CZ delineated area to the west of the installation, and the DAF easement agreements with the City of Spokane and Spokane County protect the CZ to the east. The City of Spokane and Spokane County purchased the land that covers the eastern CZ on March 6, 2008, to prevent an incompatible development from occurring in the CZ. As discussed in **Section 3.4.8**, incompatible developments, including residential and public use lands, do exist within APZ II.

Emergency Services. The 92nd Civil Engineering Squadron Fire and Emergency Services Flight provides 24-hour crash, structural, and emergency medical first response; technical rescue; hazardous material and weapons-of-mass-destruction incident response; and fire prevention, safety, and training/education services to Fairchild AFB. It also has a mutual-aid agreement with the Washington State Department of Natural Resources covering Cusick Field, which is approximately 75 miles from the installation.

3.4.10.2 Environmental Consequences

3.4.10.2.1 Analysis Methodology

The analysis methodology used to assess health and safety impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.10.2.1**.

3.4.10.2.2 Alternative 2

Flight Safety. Long-term, negligible, adverse impacts on flight safety would be expected from Alternative 2 because the increase in annual aircraft operations could increase the risk of an incident or aircraft mishap, despite there being no change in the number of aircraft operating on the installation. Because an aerial refueling mission (i.e., KC-135) already exists on the installation, transition to the KC-46A would not present new types of flight safety issues. Deicing of aircraft would continue to be conducted in accordance with existing local and federal regulations. Proposed deicing infrastructure improvements would increase deicing efficiency and reduce potential for spill. Additionally, none of the proposed new construction or facility renovations would affect navigable airspace or associated flight safety.

Bird/Wildlife-Aircraft Strike Hazard at Fairchild AFB and Vicinity. Long-term, minor, adverse impacts would be expected due to the increased potential for bird/wildlife-aircraft strikes associated with the proposed 29 percent increase in operations. The overall potential for bird/wildlife-aircraft strikes is not expected to be significantly greater than current levels because all safety actions in place for existing KC-135 operations would continue to be in place for the KC-46A aircraft. Additionally, the proposed KC-46A flight operations would be similar to those currently conducted by KC-135 aircraft at Fairchild AFB. The KC-46A flight program would incorporate use of existing DAF bird avoidance technologies and practices to minimize potential for bird/wildlife-aircraft strikes, such as use of avoidance technologies, temporary airspace limits, and pilot training.

Occupational Safety. Short-term, negligible to minor, adverse impacts on occupational safety at Fairchild AFB would be anticipated from increased occupational hazards during construction, including those from vehicles; noise/dust; air emissions; construction zones; and detours. Impacts would be minimized through compliance with all applicable AFOSH and OSHA requirements.

Short-term, minor, adverse impacts would include increased occupational hazards from the presence and operation of construction vehicles and equipment, such as use of diesel-powered vehicles and equipment; air emissions, noise and dust generation; and hazards related to active construction zones such as trips, falls, movement of equipment and materials, and road detours on the installation during construction, demolition, and renovation of facilities; however, these impacts would be temporary. All renovation and construction activities would comply with all applicable OSHA regulations and applicable installation LUCs to protect workers.

The proposed operation of 24 KC-46A PAA on the installation airfield would not create new or unique occupational safety issues. All operational activities would continue to be conducted in accordance with applicable regulations, technical orders, and DAF AFOSH standards.

No increase in risk or frequency of aircraft mishaps on the airfield would be expected under Alternative 2 because the KC-46A would be maintained, taxied, deiced, and stored in an airfield

environment where an aerial refueling mission already exists. Because the KC-46A is a new airframe and would require response actions specific to the aircraft, emergency and mishap response plans would be updated to include procedures and response actions tailored to the KC-46A and associated equipment. Proposed fueling infrastructure improvements would provide reduction in spill, fire, and contamination risk during daily operation of the KC-46A mission.

Weapons/Public Safety. Proposed construction, demolition, and renovation would not affect existing CZs or APZs; however, some proposed construction, demolition, and renovation would occur within established ESQD arcs on and near the airfield. All applicable procedures and regulations outlined in the Fairchild AFB Development Program would be followed to avoid potential safety impacts (Fairchild AFB 2014). Additionally, new facilities and infrastructure would be built in compliance with Antiterrorism/ Force Protection requirements and seismic safety regulations (as discussed in **Section 3.4.5**).

Ground-disturbing activities associated with construction, demolition, and renovation are likely to coincide with soil and groundwater contamination resulting from historic PFOA and PFOS releases. Refer to **Section 3.4.9** for more information on PFAS contamination and mitigation at Fairchild AFB.

Emergency services. Long-term, negligible, adverse impacts on fire and emergency services could occur due to the potential for increased demand on these services resulting from the increase in personnel and their families/dependents under Alternative 2.

3.4.11 Air Quality

The ROI for the air quality analysis is defined in **Section 3.3.11**.

3.4.11.1 Affected Environment

USEPA Region 10, the Washington State Department of Ecology, and the Spokane Regional Clean Air Agency regulate air quality in Washington State and the Spokane Valley Metropolitan Area. Washington State accepts the federal NAAQS listed in **Table 3-22**. Fairchild AFB is in Spokane County, Washington, which is within the Eastern Washington-Northern Idaho Interstate Air Quality Control Region (40 CFR Part 81.100). USEPA has designated the portion of Spokane County containing Fairchild AFB as attainment for all criteria pollutants.

The portion of Spokane County containing Fairchild AFB is considered “Clearly Attainment” (i.e., not within 5 percent of exceeding any NAAQS) for all criteria pollutants. **Table 3-44** summarizes the county-level air quality design values in Spokane County for O_3, the only pollutant for which 2021 monitoring data were available. Design concentrations are derived from monitoring sites throughout the entire county and are used to indicate compliance with the NAAQS based on 3-year averages, which is the basis for USEPA attainment/nonattainment designations.

Table 3-44. 2021 Air Quality Design Values for Spokane County[a]

Criteria Pollutant	Averaging Period	NAAQS	2021 Design Concentration[b]	Within 5% of Exceeding NAAQS?
O_3	8-hour	0.070 ppm	0.060 ppm	No

Source: USEPA 2022c

[a] 2021 design concentrations for CO, NO_X, $PM_{2.5}$, PM_{10}, lead, and SO_X were not available.

[b] The design concentration is the monitored (ranked or percentile based) concentration that is used to assess compliance with the NAAQS.

Key: NAAQS = National Ambient Air Quality Standards; ppm = parts per million

Spokane County contains two maintenance areas for CO and PM_{10}, respectively. Both maintenance areas overlie the Spokane Valley Metropolitan Area and are approximately 0.2 mile east of Fairchild AFB (Spokane Regional Clean Air Agency and Ecology 2015, 2016). Approximately 24 percent of all aircraft arrivals using Runway 05 approach the runway inside the air mixing zone (i.e., below 3,000 feet) within these two maintenance areas. Therefore, the General Conformity Rule is potentially applicable to emissions of CO and PM_{10} from aircraft operations. As outlined in 40 CFR Part 93.153(b), the applicable *de minimis* level thresholds for these pollutants is 100 tpy for CO and 100 tpy for PM_{10}. Because Fairchild AFB is within an area that is in full attainment for the NAAQS, the General Conformity Rule is not applicable to actions that would occur within the boundary of the installation, such as the facility and infrastructure projects.

USEPA monitors levels of criteria pollutants at representative sites throughout the United States. For reference purposes, **Table 3-45** shows the highest reported concentrations by all monitoring stations within Spokane County or other nearby counties (if not available for Spokane County) within Washington State during the last 3 years.

Table 3-45. 2019–2021 Ambient Air Monitoring Data, Spokane County/Other Washington State Counties

Air Quality Indicator	2019	2020	2021
O_3[a]			
Peak 8-hour value (ppm)	0.066	0.061	0.076
Days above federal standard (0.070 ppm)	0	0	2
PM_{10}[b]			
Peak 24-hour value (µg/m^3)	116	440	144
Days above federal standard (150 µg/m^3)	0	4	0
$PM_{2.5}$[b]			
Peak 24-hour value (µg/m^3)	35.3	396.8	117.7
Max. 98th Percentile (µg/m^3)	26.5	65.7	32.8
Days above federal standard (35 µg/m^3)	0	8	7
Annual average value (µg/m^3)	13.1	13.53	9
Federal annual average primary standard (µg/m^3)	12	12	12
CO[c]			
Peak 1-hour value (ppm)	1.50	1.52	1.37
Days above federal standard (35 ppm)	0	0	0
Peak 8-hour value (ppm)	1.1	1.2	1
Days above federal standard (9 ppm)	0	0	0
NO_X[c]			
Peak 1-hour value (ppb)	53.9	51.4	63.9
Max. 98th Percentile (ppb)	42.8	39.4	41.6
Days above federal standard (100 ppb)	0	0	0
Annual average value (ppb)	22.82	19.40	21.04
Federal annual standard (ppb)	53	53	53
SO_X[d]			
Peak 1-hour value (ppb)	1.3	2.5	1.5
Max. 99th Percentile (ppb)	1.0	1.7	1.4
Days above federal standard (75 ppb)	0	0	0
Peak 3-hour value (ppb)	1.1	1.5	1.3
Days above federal standard (0.14 ppm = 140 ppb)	0	0	0

Source: USEPA 2022i

[a] Spokane County only.

[b] 2019 and 2020 data are only for Stevens County, Washington; no 2019 or 2020 data are available for Spokane County.

[c] Data for King County, Washington.

[d] Data for Douglas County, Washington.

Key: O_3 = ozone; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter

Fairchild AFB operates under a synthetic minor source operating permit issued by the Spokane Regional Clean Air Agency. Permit requirements include annual periodic inventory of all significant stationary sources of air emissions for each of the criteria pollutants of concern,

monitoring, and recordkeeping requirements. Primary sources of air emissions at Fairchild AFB include external combustion units (boilers and hot water heaters for heat and industrial use); internal combustion engines (diesel emergency generators); surface coating and degreasing operations for maintenance of aircraft and facilities; gasoline service stations for motor vehicle fueling; and jet fuel storage and transfer operations (DAF 2020). **Table 3-46** lists Fairchild AFB's facility-wide air emissions from all significant stationary sources (Fairchild AFB 2021i). The table also includes the most recent available Spokane County annual emissions inventory (CY 2017) along with a percentage comparison to Spokane County-level emissions (USEPA 2021a). Washington State does not require permitting of mobile source emissions (e.g., aircraft and vehicle operations).

Table 3-46. Annual Emissions Inventory for Fairchild AFB (CY 2020) and Spokane County (CY 2017)

Source Name/Type	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	GHGs (tpy)
Fairchild AFB (CY 2020)							
Stationary sources	5.60	10.95	1.30	0.12	0.54	0.54	Not provided
Permitted emissions limits	100.0	90.0	100.0	100.0	100.0	100.0	N/A
Spokane County (CY 2017)							
Stationary sources	1,568	6,694	8,117	105	1,516	1,328	405,561
Area sources	752	13,198	3,079	2	15,659	2,146	9,616
Mobile sources	8,470	5,307	50,861	57	558	348	2,595,889
Total	**10,790**	**25,199**	**62,057**	**164**	**17,733**	**3,822**	**3,011,066**
Fairchild AFB (CY 2020) Percent of Spokane County Total Inventory (CY 2017)	**0.05**	**0.04**	**0.002**	**0.07**	**0.003**	**0.01**	**Not available**

Source: Fairchild AFB 2021i, USEPA 2021a

[a] The GHG emissions listed include carbon dioxide, methane, and nitrous oxide.

Key: O_3 = ozone; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; CO = carbon monoxide; NO_X = nitrogen oxides; SO_X = sulfur oxides; ppm = parts per million; ppb = parts per billion; $\mu g/m^3$ = micrograms per cubic meter; N/A = not applicable

Climate and Greenhouse Gases. The Spokane Valley has an average high temperature of 82.6°F in the hottest month of August, and an average low temperature of 21.6°F in the coldest month of December. The region has an average annual precipitation of 1.39 inches per month. The wettest month of the year is December, with an average rainfall of 2.25 inches (Idcide 2022b).

Ongoing global climate change has contributed to glacial retreat, increased frequency of drought and wildfires; reduction of water availability for irrigation; and human health effects, including effects in Washington. Warmer winters have reduced the average snowpack in Washington by 20 percent since 1950, meaning less water flowing through streams during summer months. The combination of warmer weather and lower flows affect the viability of wild fish and the effectiveness of hydroelectric power supply. Regional climate change has also contributed to a drier climate, resulting in increased wildfire risk and drought, and decreased

availability of water for crop irrigation (USEPA 2016b). In 2019, Washington State produced 84.2 million metric tons of CO_2 emissions and was ranked the 25th highest producer of CO_2 in the United States (USEIA 2019b).

3.4.11.2 Environmental Consequences

3.4.11.2.1 Analysis Methodology

The analysis methodology used to assess air quality impacts under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.11.2.1**.

Based on compliance with the NAAQS, the General Conformity Rule is potentially applicable to emissions of CO and PM_{10} from aircraft operations within the Fairchild AFB ROI. The applicable *de minimis* level threshold for these pollutants is 100 tpy (40 CFR § 93.153[b]). For emissions of attainment pollutants, the Prevention of Significant Deterioration threshold (i.e., 250 tpy for all criteria pollutants besides lead in "Clearly Attainment" areas) is used as an insignificance indicator to determine air quality significance. The indicator of 25 tpy for lead is the only screening indicator for that criteria pollutant.

3.4.11.2.2 Alternative 2

Based on compliance with the NAAQS, the General Conformity Rule is not applicable to emissions of criteria pollutants from construction activities within the boundary of Fairchild AFB. Because aircraft arrivals using Runway 05 approach the runway inside the air mixing zone (i.e., below 3,000 feet) within nearby maintenance areas for CO and PM_{10}, the General Conformity Rule is potentially applicable to emissions of CO and PM_{10} from aircraft operations. As outlined in 40 CFR Part 93.153(b), the applicable *de minimis* level thresholds for both CO and PM_{10} is 100 tpy.

Air emissions from construction activities under Alternative 2 would result in short-term, minor, adverse impacts on air quality. Emissions of criteria pollutants and GHGs would be directly produced from operation of heavy construction equipment, heavy duty diesel vehicles hauling demolition debris and construction materials to and from the Project Area, workers commuting daily to and from the Project Area, and ground disturbance. All such emissions would be temporary in nature and produced only when construction activities are occurring.

ACAM was used to estimate the air emissions from Alternative 2. **Table 3-47** provides the estimated total net change in emissions for the ROI. The total net annual emissions from construction are not expected to exceed the first- or second-level insignificance indicators. Detailed emissions calculations are included in **Appendix B**.

Table 3-47. Estimated Annual Net Change in Air Emissions Under Alternative 2

Year	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	Pb (tpy)	CO_2e (tpy)
2025 (Construction)	2.595	0.477	3.734	0.009	72.854	0.098	<0.001	856.7
2026 (Construction)	6.362	1.111	8.825	0.019	21.365	0.245	<0.001	1,883.3
2027 (Construction)	6.181	1.071	8.491	0.018	0.241	0.239	<0.001	1,802.0
2028 (Construction and Operation)	39.994	14.613	7.869	1.185	-1.217	-0.368	<0.001	5,351.4
2029 (Operation)	141.432	7.979	5.977	4.683	-5.590	-2.189	<0.001	15,996.8
Insignificance indicator [a]	250	250	250	250	250	250	25	None
Exceeds insignificance indicator?	No	No	No	No	No	No	No	N/A

[a] Fairchild AFB is within an area that is "Clearly Attainment" for all criteria pollutants. Therefore, the Prevention of Significant Deterioration threshold (i.e., insignificance indicator)of 250 tpy (25 tpy for lead) was applied to emissions from construction and operations within the boundary of Fairchild AFB.
Key: NO_X = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; Pb = lead; CO_2e = carbon dioxide equivalent; tpy = tons per year; N/A = not applicable

The air pollutant of greatest concern during construction is particulate matter, such as fugitive dust. The quantity of uncontrolled fugitive dust emissions from a site is proportional to the area of land being worked and the level of activity. Fugitive dust air emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. Particulate matter air emissions would also occur during combustion of fuels in vehicles and equipment during construction. Emissions of PM_{10} from construction would be temporary and would cease once construction is completed. Additionally, the estimated emissions in **Table 3-47** do not account for BMPs and environmental control measures, which are likely to reduce uncontrolled particulate matter emissions by approximately 50 percent. Construction contractors would employ BMPs and environmental control measures, as listed in **Section 3.3.11.2.2**, to the greatest extent applicable.

Long-term, moderate, adverse, and minor, beneficial impacts on air quality would occur from Alternative 2. Air emissions would be directly produced from operation, heating and cooling of new facilities, KC-46A aircraft operations, and additional personnel at Fairchild AFB. Long-term operational air emissions from Alternative 2 would begin in October 2028 and continue indefinitely. The annual operational air emissions were estimated using ACAM and are summarized in **Table 3-47**. The General Conformity Rule is not applicable to emissions of criteria pollutants from operations within the boundary of Fairchild AFB, based on compliance with the NAAQS. **Table 3-47** shows the annual net change of operational emissions starting in 2029 would not exceed the insignificance indicator of 250 tpy (25 tpy for lead). Therefore, air quality impacts from long-term operations would not be significant. **Table 3-47** shows Alternative 2 would result in an annual net decrease of PM_{10} and $PM_{2.5}$ emissions, resulting in long-term, minor, beneficial, impacts on air quality for these pollutants.

The pollutant of greatest concern during long-term operations is NO_X. Projected emissions of NO_X resulting from Alternative 2 were compared to the most recent emissions inventory for Spokane County (i.e., CY 2017) to determine the relative magnitude of these emissions, and their potential to contribute to an exceedance of the NAAQS for NO_X. The estimated increase of NO_X emissions from operations under Alternative 2 would comprise approximately 1.31 percent of the total NO_X emissions generated by Spokane County in 2017 (141.432/10,790 x 100 = 1.31 percent). The majority of operational NO_X emissions from Alternative 2 would result from aircraft operations to an altitude of 3,000 feet AGL and across several square miles that comprise the Fairchild AFB airspace and associated flight routes. At or higher than this altitude, the projected NO_X emissions would be adequately dispersed through the atmosphere to the point they would not result in substantial ground-level impacts on a localized area. The portion of Spokane County containing Fairchild AFB is considered "Clearly Attainment" for all criteria pollutants, meaning the county is not within 5 percent of exceeding any NAAQS. Because Alternative 2 would increase the county's NO_X emissions by less than 2 percent and this NO_X increase of 141.432 tpy is less than the 250 tpy insignificance indicator per the *Air Force Air Quality EIAP Guide, Volume II – Advanced Assessments*, the operational NO_X emissions from the Alternative 2 would not be substantial enough to contribute to an exceedance of the NO_X NAAQS. Additionally, the General Conformity Rule is not applicable to emissions of criteria pollutants from operational emissions within the boundary of Fairchild AFB, based on compliance with the NAAQS.

Air emissions from stationary sources (i.e., heating systems) at new facilities would not increase the installation's potential to emit above major source thresholds. Therefore, Alternative 2 would not result in a change of the air permitting classification for Fairchild AFB to major source status. If required, new minor sources of air emissions would be added to the installation's synthetic minor source operating permit.

As noted above, the General Conformity Rule is potentially applicable to emissions of CO and PM_{10} from aircraft operations because aircraft arrivals using Runway 05 approach the runway inside the air mixing zone (i.e., below 3,000 feet) within nearby maintenance areas for CO and PM_{10}. As such, the applicable *de minimis* level threshold for both pollutants is 100 tpy. **Table 3-48** provides the estimated total net change in emissions from Alternative 2 for aircraft operations only. Air emissions from aircraft operations would not exceed the *de minimis* level thresholds for CO and PM_{10}; therefore, a General Conformity Rule conformity analysis is not applicable.

Table 3-48. Estimated Net Change in Air Emissions from Aircraft Operations under Alternative 2

	NO_X (tpy)	VOC (tpy)	CO (tpy)	SO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	Pb (tpy)	CO_2e (tpy)
Beddown 24 KC-46A	202.801	7.750	37.918	12.205	0.692	0.580	<0.001	36,400.6
Remove 24 KC-135	-33.449	-0.290	-36.553	-4.905	-6.282	-2.790	<0.001	-14,825.3
Net Change	139.434	7.205	-3.379	4.669	-5.712	-2.308	<0.001	13,625.3
de minimis threshold[a]	N/A	N/A	100	N/A	100	N/A	N/A	N/A
Exceeds *de minimis* threshold?	N/A	N/A	No	N/A	No	N/A	N/A	N/A

[a] Aircraft operations below 3,000 feet occur within CO and PM_{10} maintenance areas. Therefore, the General Conformity Rule is potentially applicable to emissions of CO and PM_{10}. The *de minimis* level threshold for these pollutants is 100 tpy. *De minimis* level thresholds do not apply to emissions of other criteria pollutants.

Key: NO_X = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO_X = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; Pb = lead; CO_2e = carbon dioxide equivalent; tpy = tons per year; N/A = not applicable

Climate Change and Greenhouse Gases. Consistent with EO 14008, this EIS examines GHGs as a category of air emissions. It also examines potential future climate scenarios to determine whether elements of Alternative 2 would be affected by climate change. This EIS does not attempt to measure the actual incremental impacts of GHG emissions from Alternative 2, as there is a lack of consensus on how to measure such impacts. Construction under Alternative 2 would produce a yearly maximum of approximately 1,883.3 tons (1,709 metric tons) of direct CO_2e. By comparison, 1,709 metric tons of CO_2e is approximately the GHG footprint of 368 passenger vehicles driven for 1 year or 333 homes' energy use for 1 year (USEPA 2022f). In 2017, Spokane County produced 3,011,066 tons of CO_2e emissions. Emissions from construction during the highest CO_2e emission year (i.e., 2026) under Alternative 2 would represent less than 0.1 percent of the total CO_2e emissions from the county. Operation under Alternative 2 would result in a net increase in CO_2e emissions of 15,996.8 tpy, which is equivalent to the GHG footprint of 3,127 passenger vehicles driven for 1 year or 1,828 homes' energy use for 1 year (USEPA 2022f). The net increase of CO_2e emissions would increase the yearly CO_2e emissions produced by the county by approximately 0.5 percent, resulting in long-term, minor, adverse impacts. As such, new CO_2e emissions would represent a small percentage of the total CO_2e emissions produced from the county. Therefore, air emissions produced during construction and operation of the new facilities would not meaningfully contribute to the potential effects of global climate change and would not increase the total CO_2e emissions produced by Spokane County.

Per EO 14008, DoD UFC-2-100-01, and the DoD's 2021 *Climate Adaptation Plan*, planning, design, and construction of new facilities and infrastructure on the installations would incorporate measures, strategy, and technology to promote climate resiliency to the extent practicable. Ongoing changes to climate patterns in Washington State are described in **Section 3.4.11.1**. These climate changes are unlikely to affect the DAF's ability to implement Alternative 2. **Table 3-49** outlines potential climate stressors and their effects on Alternative 2. All elements of Alternative 2 in-and-of-themselves are only indirectly dependent on any of the elements

associated with future climate scenarios (e.g., meteorological changes). At this time, no future climate scenario or potential climate stressor would have appreciable effects on any element of Alternative 2.

Table 3-49. Effects of Potential Climate Stressors on Alternative 2

Potential Climate Stressor	Effects on Alternative 2
Glacial retreat	Negligible
Increased frequency of drought and wildfires	Minor
Reduction of water availability for irrigation	Negligible
Human health effects	Negligible

Source: USEPA 2016b

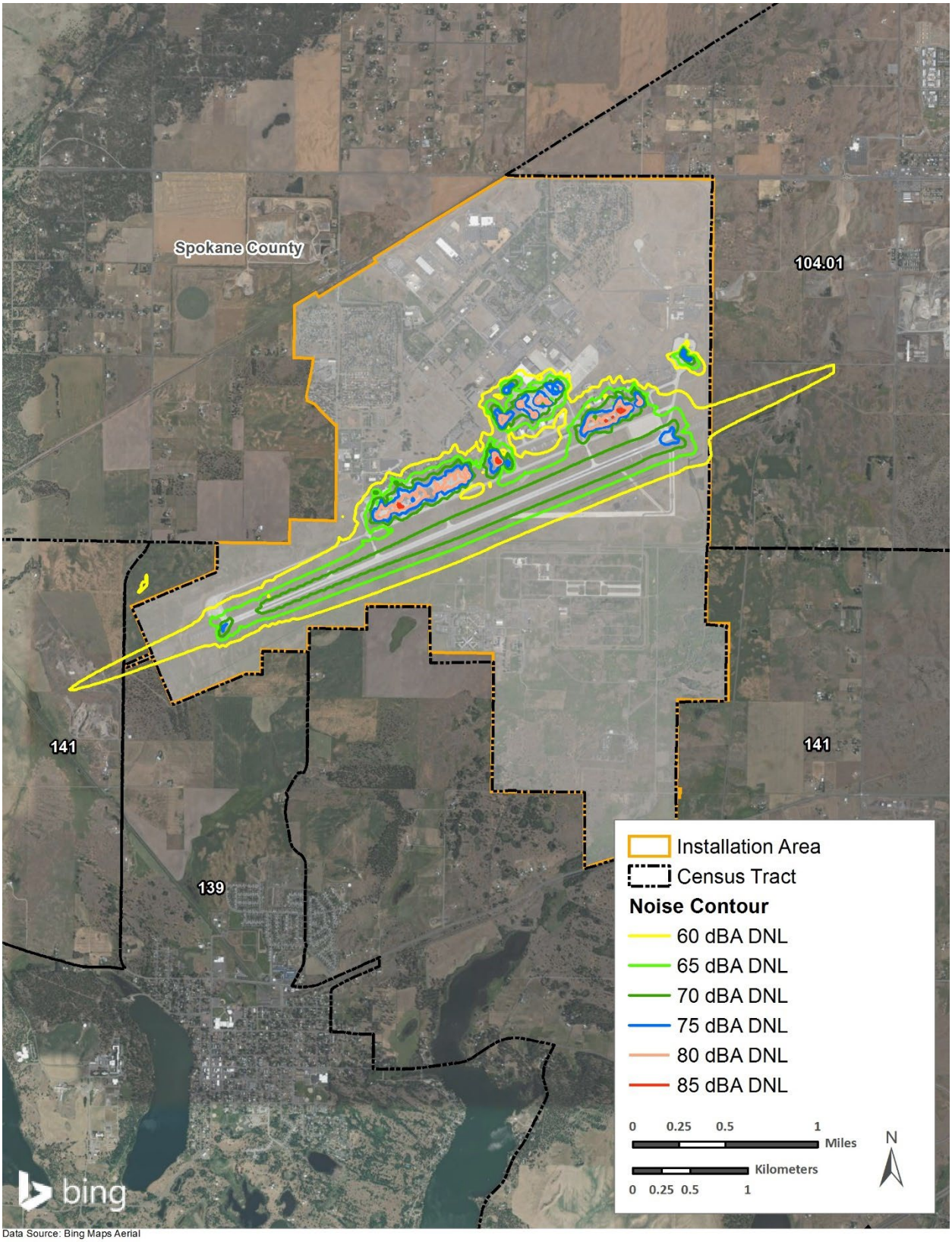
3.4.12 Environmental Justice and Other Sensitive Receptors

The ROI for the environmental justice and other sensitive receptors analysis are defined in **Section 3.3.12**.

3.4.12.1 Affected Environment

The environmental justice and sensitive receptors ROI for Alternative 2 at Fairchild AFB consists of census tracts 104.01, 139, and 141 (see **Figure 3-21**). Similar to the discussion in **Section 3.3.12**, the environmental justice and other sensitive receptors analysis focuses on off-installation areas within the ROI at Fairchild AFB for Alternative 2. To characterize the baseline minority and low-income environmental justice communities, and sensitive child and elderly receptor populations in the Fairchild AFB vicinity, data for Washington State and Spokane County are provided as communities of comparison.

Table 3-50 presents characteristics of the minority and low-income environmental justice populations, and elderly and child sensitive receptor populations within the census tracts of the ROI as compared with the populations of Spokane County and Washington State. In 2020, the minority population for tract 104.01 was greater than that of Spokane County and Washington State and was, therefore, considered a minority environmental justice community. The percentage of low-income persons within tract 104.01 was meaningfully greater than and nearly double both Spokane County and Washington State and was, therefore, determined to be a low-income environmental justice community (USCB 2020a). The percentage minority and low-income persons within census tracts 139 and 141 were lower than those of the communities of comparison and, therefore, were not determined to be environmental justice communities (see **Table 3-50;** USCB 2020a).



Data Source: Bing Maps Aerial

Figure 3-21. Environmental Justice and Sensitive Receptors ROI for Alternative 2

Table 3-50. Minority, Low-Income, Child, and Elderly Populations in the Fairchild AFB Vicinity

Geographic Area	Total Population	Percent Minority[a]	Percent Low-income	Percent Elderly[a]	Percent Children
Census Tract					
104.01	7,675	34.4[b]	22.2[b]	8.0	18.7
139	5,618	9.4	7.3	13.3	19.2
141	6,201	6.3	0.7	16.6	25.8[c]
Community of Comparison					
Spokane County	513,402	13.1	12.9	16.2	22.1
Washington State	7,512,465	26.5	10.2	15.4	22.0

[a] USCB 2020a
[b] Indicates the percentage of the population is meaningfully greater than the percentage of the reference population of the community of comparison, and is therefore considered an environmental justice community.
[c] Indicates the percentage of the population is meaningfully greater than the percentage of the reference population of the community of comparison, and is therefore considered a sensitive receptor community.

Table 3-50 provides the percent of children and elderly persons within the ROI and other areas for general characterization purposes. The elderly population in census tract 141 at 16.6 percent is consistent with that of Spokane County and slightly higher than Washington State. The elderly populations in census tracts 104.01 and 139 were lower than those of the communities of comparison, ranging from 8 to 14 percent. Child populations in census tracts 104.01 and 139 at 18.7 and 19.2 percent, respectively, were lower than those of the communities of comparison. The child population within census tract 141 is higher than those of Spokane County and Washington State. No schools, childcare centers, hospitals, nor retirement communities are located within the ROI. The land directly adjacent to the installation boundary is largely wild space; therefore, environmental justice and sensitive receptor populations would not be expected to congregate there.

3.4.12.2 Environmental Consequences

3.4.12.2.1 Analysis Methodology

The analysis methodology used to assess impacts on environmental justice communities and other sensitive receptors under Alternative 2 are the same as those used for the Alternative 1 analysis described in **Section 3.3.12.2.1**.

3.4.12.2.2 Alternative 2

Short-term, negligible, adverse impacts on environmental justice or sensitive receptor populations could occur from increased noise and actions associated with construction, demolition, and renovation. Proposed construction and renovation would occur within discrete areas of Fairchild AFB in land uses that are functionally related to the airfield, where access is generally restricted to military and DoD civilian personnel. Standard construction safety BMPs (e.g., fencing and other security measures) would reduce potential risks to on-installation populations to minimal levels. Temporary increases in air emissions, noise, and traffic associated with construction and renovation may impact surrounding areas and populations. Therefore, short-term, negligible, adverse impacts on environmental justice or sensitive receptor

populations could occur from construction and renovation associated with Alternative 2. These impacts however would be distributed evenly across the surrounding area and would not be disproportionate on any populations, including minority and low-income populations; nor would exposure of children and elderly persons to environmental health risks or safety risks be increased.

Populations in the ROI are currently experiencing noise under the KC-135 mission at Fairchild AFB and would continue to experience noise under Alternative 2. Annual operations at Fairchild AFB would increase by 29 percent, and the noise contours would also increase. Aircraft noise from the KC-46A and KC-135 operations would continue to cause adverse impacts on populations within the ROI. An additional approximately 54 acres of off-installation land within the ROI would fall under the 60-dBA DNL, including approximately 9 acres of tract 139, 11 acres of tract 141, and 34 acres of tract 104.01. Because the 60-dBA DNL is less than the 65-dBA DNL, for which noise-sensitive land uses are generally acceptable, long-term, adverse impacts would be negligible.

All changes to the 65+ dBA DNL contours would occur within the installation, and no schools, childcare centers, hospitals, retirement communities, or other areas where sensitive receptors might congregate within the ROI would be affected beyond existing noise impacts. Additionally, most of the off-installation affected land within the ROI is largely vacant. Therefore, no adverse noise impacts would be expected on civilians outside the installation, including sensitive receptor populations.

3.5 No Action Alternative

Evaluation of the No Action Alternative compares the impacts of implementing the MOB 6 beddown with the impacts of the No Action Alternative at each installation and for each resource area. Under the No Action Alternative, the following would apply:

- No construction would occur to develop the facilities as proposed for the MOB 6 beddown
- No change in aircraft based at MacDill AFB; operations at MacDill AFB would continue as described for baseline conditions.
- No change in aircraft based at Fairchild AFB; operations at Fairchild AFB would continue as described for baseline conditions. The 92 ARW would continue to fly aerial refueling missions with 36 KC-135 PAA. Additionally, the SERE, JPRA, and KC-135 WIC missions would continue.

Under the No Action Alternative, the affected environments for each resource area at both installations would continue as described in **Sections 3.3** and **3.4**. At each installation, ongoing training operations as well as other planned and approved installation development activities (identified in the cumulative effects analyses in **Section 3.6**) and programs would continue. The existing activities have been approved by DAF and are supported by existing NEPA documentation.

3.6 Cumulative Effects

As noted in **Section 1.1**, this EIS has been developed in accordance with the 2020 CEQ NEPA regulations (40 CFR 1500), as amended in 2022, which requires assessment of cumulative

effects. A cumulative effect is defined as the following (40 CFR Part 1508.1(g)(3)): An effect on the environment that results from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

The cumulative effects analysis approach is provided in **Section 3.6.1**. **Section 3.6.2** lists the reasonably foreseeable actions identified in the Project Areas which would be evaluated with Alternative 1 and Alternative 2 to determine cumulative effects on resources. Respectively, **Sections 3.6.3 and 3.6.4** provide the cumulative impacts analyses for resources in the MacDill AFB and Fairchild AFB Project Areas. The reasonably foreseeable actions could occur whether or not the Proposed Action is implemented. Discussion of the irreversible and irretrievable commitments of resources is provided in **Section 3.6.5.**

3.6.1 Analysis Methodology

Actions that have a potential to interact with the Proposed Action at MacDill AFB (Alternative 1) or Fairchild AFB (Alternative 2) are included in this cumulative effects analysis. This approach enables decision makers to have the most current information available so they can evaluate the range of environmental consequences that would result from the beddown of KC-46A aircraft, infrastructure, and personnel at these locations. Known construction and upgrades to support the KC-46A MOB 6 beddown are a part of the analysis contained in this EIS; however, potential future requirements cannot be predicted. As those requirements become known in the future, NEPA analysis would be conducted, as required.

The assessment of cumulative effects involves identifying and defining the scope of other actions and their interrelationship with a proposed action or alternatives. The scope must consider other projects that coincide with the location and timeline of a proposed action and other actions. Because past and present actions are considered part of the existing condition as described in the affected environment for each resource, this cumulative effects analysis focuses on reasonably foreseeable actions that would be taking place within and near MacDill AFB and Fairchild AFB on a timeline concurrent with the Proposed Action.

3.6.2 Reasonably Foreseeable Actions

Reasonably foreseeable actions that could in combination with the Proposed Action and alternatives contribute to additional impacts on the human environment are discussed in **Tables 3-51** and **3-52** for Alternative 1 at MacDill AFB and Alternative 2 at Fairchild AFB, respectively. **Sections 3.6.3** and **3.6.4** summarize the evaluation of cumulative effects based on the context, intensity, and timing of the Proposed Action related to the reasonably foreseeable actions. For each alternative, a summary of the cumulative effects is provided in a table followed by a discussion for each resource area.

Table 3-51. Reasonably Foreseeable Actions at MacDill AFB and Vicinity

Action	Proponent/ Location	Timeframe	Description	Resource Area Interaction
Military Actions				
Power Generation Facility	MacDill AFB	2022–2025	The DAF has an energy insurance lease under TECO to construct and operate a distributed power generation facility at MacDill AFB (MacDill AFB 2022c).	Air Quality, Noise, Land Use, Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation
Pipeline Replacement	MacDill AFB	2022–2024	MacDill AFB proposes to replace the pipeline from Chevron to the DFSP facility (DAF 2021c).	Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation, Water Resources (wetlands)
USSOCOM MISO Facility	MacDill AFB	2024–2026	USSOCOM has constructed temporary MISO facilities and has planned for permanent MISO facilities on the installation. The location previously selected for the MISO permanent facility has been changed, so NEPA must be conducted for the new proposed MISO facility location at MacDill AFB (MacDill AFB 2019d).	All resources
USSOCOM – Special Operations Forces Operations Integration Facility	MacDill AFB	2024–2026	The National Security Council has directed a USSOCOM mission to operate at MacDill AFB. Offices within USSOCOM Headquarters at MacDill AFB have been remodeled to create 50 additional seats for personnel to begin the assigned mission. USSOCOM however needs a secure and segregated facility with secure network access for 180–190 personnel at a time to operate to accomplish the assigned mission. A permanent facility is being planned and would be constructed to support this mission in 2025, but it would not be ready when this mission is directed to begin in 2022. The temporary building serves as facilities for USSOCOM until the permanent facility can be constructed. The modular and permanent facilities would be located just north of the Special Operations Command Central compound in the location of the current ground maintenance facilities. The grounds maintenance facilities would be relocated.	Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation

Action	Proponent/ Location	Timeframe	Description	Resource Area Interaction
FGUA Sanitary Sewer Effluent Deep Injection Well	MacDill AFB	2023–2024	FGUA's wastewater permit currently allows for land application re-use on the golf courses, with two additional sprayfields and a wet weather storage pond, but not NPDES discharge. FGUA is proposing to apply for a deep injection well for disposing the sanitary sewer effluent.	Soils and Geology, Water Resources, Infrastructure and Transportation, Cultural Resources
FGUA Sanitary Sewer Expansion to West Side	MacDill AFB	2023–2027	FGUA is proposing to expand the sanitary sewer system to the western side of the runway, which is currently served by septic systems. The proposed expansion would start at the new United States Army Reserve (UH-60) lift station, run to the Control Tower, and expand north and south from there (MacDill AFB 2022d).	Natural & Cultural Resources, Soils and Geology, Hazardous Waste and Materials, and Infrastructure and Transportation
Passenger Ferry	MacDill AFB	2023–2024	Passenger ferry service is proposed across Tampa Bay from MacDill AFB to southern Hillsborough County. The project would include a ferry terminal at MacDill AFB, a transit vehicle storage facility, and increased mass transit around the installation. Some dredging may be required to clear the channel for ferry crossing.	Noise, Water Resources, Infrastructure and Transportation, Biological Resources (T&E species), Soils and Geology, Hazardous Waste and Materials, Socioeconomic
ERCIP Project – Convert Overhead Electrical Distribution to Underground	MacDill AFB	2024–2026	The ERCIP Project proposes the recapitalization of 31,600 linear feet of primary overhead electrical distribution systems to below ground. The Proposed Action would include installation of underground cables jacketed in Linear Low-Density Polyethylene into underground conduit encased in concrete, pad mounted transformers elevated above the 100-year floodplain, below-ground cable junction boxes, distribution panels, switchgear and associated support equipment, and streetlights mounted on new poles. Construction would include a combination of directional boring, trenching, and excavation; dewatering of the excavated trench/bored hole; backfill; compaction; disposal of spoils in excess; temporary soil stockpiling; 4-inch topsoil placement in areas; and reseeding/replanting of the disturbed ground within the Project Area.	Natural and Cultural Resources, Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation

Action	Proponent/ Location	Timeframe	Description	Resource Area Interaction
ERCIP – Energy Resilience Transmission and Substations System	MacDill AFB	2022–2024	This action would improve the installation's energy resilience by upgrading and adding redundancy to the electrical distribution system. Proposed improvements include upgrading the switch gear capacity at the Tanker Way Gate electrical substation from 25 kV to 35 kV. Additionally, a total of 22,100 linear feet of new 15-kV electrical distribution lines would be installed to interconnect the Tanker Way Gate substation with the Dale Mabry Gate, the MacDill Avenue Gate, and a new 2,037-square-foot switching station to be constructed near the south flight apron. A 768-square-foot electric power station building would be constructed at the Tanker Way Gate. The 15-kV, below-ground, electrical distribution line would be housed in high density polyethylene conduit, which would be encased in concrete. Installation of the electrical line would be accomplished primarily through direct burial with directional boring used, as needed, to avoid impacts to roadways, taxiways, drainage ditches, and archaeological sites.	Biological Resources, Cultural Resources, Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation
Fuels Operations Facility	MacDill AFB	2025	MacDill proposes construction of a new 3,580-square-foot fuels operation facility in the parking lot east of Building 1062. Once completed, Building 1062 would be demolished and a 4,296-square-foot parking lot would be constructed in its place (MacDill AFB 2020b).	Soils and Geology, Hazardous Waste and Materials, Infrastructure and Transportation
Marina Channel Maintenance Dredging	MacDill AFB	2027–2028	The purpose of this action is to maintain required width and depth of the marina channel. This action is accomplished, on average, every 10 years. Maintenance dredging enables security forces to safely access the marina basin, Coon Creek basin, and Tampa Bay during all tidal levels throughout the year via two connecting channels. These channels are located within the same area on the southern portion of the installation (MacDill AFB 2016).	Water Quality, Noise (underwater), Biological Resources, Cultural Resources, Geology and Soils, Hazardous Materials and Waste
Various Installation Development Projects	MacDill AFB	2020–Future	This includes various short- to long-range facility, airfield, transportation network, energy, and utility development projects proposed to meet mission requirements at MacDill AFB (MacDill AFB 2019b).	All resources
State and Local Actions				
FDOT Projects	FDOT/Hillsborough County	FY 2023–2027	These projects include bridge repair/rehabilitation, traffic signal updates, Information Technology Services communication	Noise, Air Quality, Infrastructure and Transportation

Action	Proponent/ Location	Timeframe	Description	Resource Area Interaction
			system installations, repaving, and sidewalk additions projects (FDOT 2021b).	
Manhattan/Interbay Improvements	City of Tampa	2022–Future	These improvements include maintenance and construction associated with roadways adjacent to MacDill AFB.	Air Quality, Infrastructure and Transportation
ELAPP Storm Water Improvements – South Tampa	City of Tampa	2022–Future	A series of stormwater improvement projects are planned for the South Tampa area to better deal with surface water runoff during the rainy season. This project includes infrastructure improvements and biological stormwater treatment in a created wetland system.	Water Resources, Biological Resources, Infrastructure

Key: TECO = Tampa Electric Company; USSOCOM = U.S. Special Operations Command; MISO = Military Information Support Operations; NEPA = National Environmental Policy Act; FGUA = Florida Governmental Utility Authority; NPDES = National Pollutant Discharge Elimination System; T&E = threatened and endangered; ERCIP = Energy Resilience and Conservation Investment Program; kV = kilovolt ; FDOT = Florida Department of Transportation; FY = fiscal year; ELAPP = Environmental Land Acquisition and Protection Program

Table 3-52. Reasonably Foreseeable Actions at Fairchild AFB and Vicinity

Action	Proponent/Location	Timeframe	Description	Resource Area Interaction
Military Actions				
IDEA	Fairchild AFB	Current–FY 2023	The Fairchild AFB NEPA Team would review the current IDEA, and develop the next IDEA programmed for FY 2023 and associated installation projects.	All resources
Water Well Connection	Fairchild AFB	FY 2023–Future	Fairchild AFB proposes to construct 10 miles of a water well connection running through the community.	Water Resources, Infrastructure and Transportation
State and Local Actions				
Brooks Road Crossing	Washington State Department of Transportation/Spokane County	Future	The Washington State Department of Transportation proposes to upgrade the Brooks Road Crossing outside of Fairchild AFB, including installing a median barrier and guardrail, upgrading lighting to light emitting diode source, and updating signs and markings (WSDOT 2022).	Infrastructure and Transportation, Health and Safety

Key: IDEA = Installation Development Environmental Assessment; FY = fiscal year; NEPA = National Environmental Policy Act

3.6.3 Alternative 1 (Preferred Alternative) – MacDill AFB

This section evaluates the cumulative effects from Alternative 1 at MacDill AFB when combined with the reasonably foreseeable actions identified in **Table 3-51**. **Table 3-53** provides a summary of the cumulative effects; the MOB 6 beddown at MacDill AFB, when combined with other reasonably foreseeable projects that would be constructed and/or operated concurrently, would not result in cumulatively significant impacts on any resource areas analyzed in this EIS.

Table 3-53. Summary of Cumulative Effects for Alternative 1 (Preferred Alternative) at MacDill AFB

Resource Area	Alternative 1 (Preferred Alternative)	Reasonably Foreseeable Actions	Cumulative Effects
Noise	◘ +	◘	◘
Biological Resources	◘ +	◘	◘
Cultural Resources	◘	○	◘
Socioeconomics	+	+	+
Soils and Geology	◘	◘	◘
Water Resources	◘	◘ +	◘ +
Infrastructure and Transportation	◘ +	◘ +	◘ +
Land Use	◘ +	◘	◘ +
Hazardous Materials and Waste	◘	◘	◘
Health and Safety	◘ +	◘	◘ +
Air Quality	◘	◘	◘
Environmental Justice and Other Sensitive Receptors	○	◘ +	◘ +

Key: ○ = negligible or no impacts; ◘ = minor to moderate impacts that are not significant; ● = significant impacts; **+ =** beneficial impacts

3.6.3.1 Noise

Localized, short-term, minor, adverse impacts on the noise environment would be expected under Alternative 1 due to noise generated from heavy equipment used during construction. When conducted concurrently with any of the reasonably foreseeable actions identified in **Table 3-51**, these impacts would be slightly greater. BMPs implemented for Alternative 1 and other on-installation projects would help reduce potential impacts on the noise environment. These impacts would be temporary and minor. Long-term, minor, beneficial impacts would be expected under Alternative 1 due to a decrease in land acreage impacted by the aircraft operations noise contours. Construction of a new power generation facility and the various operations facilities described in **Table 3-51**, as well as the daily operation of the Passenger Ferry, would increase operational noise. Operational noise would generally be quieter than aircraft noise, so no long-term, cumulative impacts would be anticipated.

3.6.3.2 Biological Resources

The adverse impacts on biological resources at MacDill AFB are associated with short-term noise impacts related to construction, including heavy equipment usage and increased human presence. Reasonably foreseeable actions identified in **Table 3-51** and various installation development projects may result in cumulative noise impacts on wildlife. Species would be expected to migrate to and use adjacent suitable habitat during noise events. Additionally, most of the wildlife inhabiting these areas are habituated to noise disturbances because of the urbanized environment. The DAF would continue to follow all minimization and mitigation measures outlined in standard operating procedures and/or agreed upon during ESA Section 7 consultations. Combined increases could occur in the frequency of startle responses or other behavioral modifications caused by combined construction activities. As with Alternative 1, these cumulative projects are in already disturbed areas, so loss of vegetation and habitat, and any potential increased startle responses would be expected to be minimal.

It is possible the Environmental Land Acquisition and Protection Program (ELAPP) Storm Water Improvements project in South Tampa state project could minimally contribute to noise impacts on wildlife; however, the distance between that project and construction under the Proposed Action makes it unlikely there would be any cumulative noise impacts.

The Marina Channel Maintenance Dredging and Passenger Ferry projects may have some combined impacts from the transportation of equipment, increased human presence, and construction and operational noise. Cumulative adverse impacts from the reasonably foreseeable actions combined with Alternative 1 would be short-term and minor to moderate for construction associated noise, long-term and negligible for loss of habitat and vegetation, and long-term and minor for operational noise on shorebirds. No cumulative impacts on protected plants are anticipated.

3.6.3.3 Cultural Resources

The reasonably foreseeable actions identified in **Table 3-51** that have the potential to interact with Alternative 1 to impact cultural resources consist of the U.S. Special Operations Command (USSOCOM) MISO Facility, FGUA Sanitary Sewer, FGUA Sanitary Sewer Expansion to West Side, Energy Resilience and Conservation Investment Program (ERCIP) Project – Convert Overhead Electrical Distribution to Underground, ERCIP – Energy Resilience Transmission and Substations System, and Marina Channel Maintenance Dredging projects. Those reasonably foreseeable actions would require ground-disturbing activities and/or introduce new buildings and/or structures to the installation that could result in visual impacts to historic properties. The potential for adverse effects under Section 106 would be analyzed for each individual project.

Given the extent of archaeological survey previously completed on MacDill AFB and that no archaeological resources are in the APE, it is likely that potential adverse effects under Section 106 would be specific to architectural resources and could be successfully mitigated in consultation with the Florida SHPO through the development and implementation of an agreement document. It is anticipated that the long-term impacts of Alternative 1 would be reduced to moderate impacts under NEPA with mitigation, and that the other identified

reasonably foreseeable actions would not contribute more than minor effects. Therefore, long-term, moderate, cumulative impacts on cultural resources would be expected under NEPA.

3.6.3.4 Soils and Geology

If construction for any of the other installation projects listed in **Table 3-51** was to occur simultaneously with Alternative 1, ground disturbance, soil compaction, and erosion associated with the construction efforts would result in cumulative minor to moderate impacts on soils and geology. Due to implementation of BMPs and project-specific and installation ESCPs and SWPPPs, these impacts would be temporary and minor. Long-term, minor to moderate, cumulative impacts would occur due to increased erosion and sedimentation associated with the increase in impervious surfaces from Alternative 1 and other construction or dredging projects identified in **Table 3-51** at MacDill AFB.

3.6.3.5 Socioeconomics

Alternative 1 and reasonably foreseeable actions at MacDill AFB and the surrounding area have the potential to positively impact socioeconomics in the local communities. Construction activities on MacDill AFB would have short-term, minor, beneficial, cumulative socioeconomic impacts through local construction employment and wages, and direct and indirect benefits from local spending. Long-term, minor, beneficial, cumulative impacts would be realized from public and private economic development initiatives in the greater Tampa area. Additional residential, commercial, office/business, and tourism development would generate local permanent employment, wage, and sales tax income to support the local economy.

3.6.3.6 Water Resources

Short-term, negligible to minor, adverse impacts on water resources could occur due to ground disturbance and incidental contaminant discharges that may potentially reach the surficial aquifer in this area and increased erosion and sedimentation under Alternative 1. When combined with construction or dredging associated with any of the reasonably foreseeable actions identified in **Table 3-51**, these impacts may be slightly greater.

Long-term, minor to moderate, adverse, cumulative impacts on water resources would result from increased erosion and sedimentation associated with the increase in impervious surfaces under Alternative 1 in combination with the other infrastructure and facility construction projects identified in **Table 3-51**. Impacts would be minimized through implementation of BMPs, project-specific and installation ESCPs and SWPPPs, and Section 438 of the EISA.

3.6.3.7 Infrastructure and Transportation

Alternative 1 and reasonably foreseeable actions at MacDill AFB and within the surrounding area have the potential to affect the following infrastructure: potable water, electrical system, liquid fuel supply, sanitary sewer and wastewater, stormwater system, communications, solid waste management, liquid fuels supply, airfield, and transportation. Short-term, minor, adverse cumulative impacts during construction would be anticipated from potential on- and off-installation service interruptions should utility lines need to be rerouted, when a new facility is connected to the distribution systems, or when new utility distribution systems are added.

Upgrade and construction of new infrastructure on- and off-installation, such as the Power Generation Facility, Pipeline Replacement, FGUA Sanitary Sewer Expansion, ERCIP Projects, ELAPP Storm Water Improvements, and various installation development projects would result in long-term, beneficial impacts from upgraded and new utility supply systems, increasing the efficiency of such utility systems at MacDill AFB. Long-term, minor, beneficial impacts also would occur on transportation at MacDill AFB from the addition of a Passenger Ferry transit option, which could be used by commuting personnel and help alleviate potential gate congestion from additional personnel under the Alternative 1. Additionally, the FDOT projects and Manhattan/Interbay Improvements would improve regional transportation systems and the roadway network, relieving potential additional traffic congestion resulting from Alternative 1. Long-term, negligible to minor, adverse cumulative impacts on the infrastructure and transportation systems at MacDill AFB could occur if any reasonably foreseeable action required the permanent addition of personnel at the installation, or if state and local reasonably foreseeable actions resulted in an increase of Hillsborough County residents, increasing the demand for public utilities. Overall, Alternative 1, when combined with other reasonably foreseeable future projects, would result in a minor cumulative impact on infrastructure.

3.6.3.8 Land Use

Short-term, minor, adverse, cumulative impacts on MacDill AFB land use would result from temporary increases in noise levels if any of the other on-installation construction, demolition, or renovation projects listed in **Table 3-51** were to occur simultaneously with Alternative 1. Additional short-term, minor, adverse, cumulative impacts could occur from a temporary reduction in facility, airfield ramp, and hangar availability during any simultaneous construction, demolition, or renovation projects; minimal disruptions to ongoing operations would be expected. The combined noise levels from these projects and Alternative 1 would not result in additional areas of incompatible land use nor preclude the viability of the existing land uses; therefore, minor cumulative impacts would be expected.

Because all future development on MacDill AFB would adhere to the IDP, long-term, minor, beneficial, cumulative impacts on MacDill AFB land use would occur due to the implementation of Alternative 1 in conjunction with on-installation reasonably foreseeable projects. These projects would consolidate like functions and increase efficiency, and facility demolition would remove outdated and underused facilities or portions of facilities. Therefore, they would result in an efficient use of installation land and would not conflict with existing or future land uses on the installation.

No cumulative impacts on off-installation land use would be expected because any construction, demolition, or renovation projects on off-installation land would not be expected to interact with Alternative 1, which would be implemented entirely on MacDill AFB. Apart from Alternative 1, none of the cumulative projects listed in **Table 3-51** would result in a change to MacDill AFB aircraft operations or corresponding land use. Prior to the implementation of any construction, demolition, or renovation project listed in **Table 3-51**, the DAF would obtain an Environmental Resource Permit to ensure consistency with the FCMP.

3.6.3.9 Hazardous Materials and Waste

Short-term, minor, adverse impacts would occur under Alternative 1 from the use of hazardous materials and petroleum products; generation of hazardous wastes during the proposed construction, demolition, and renovation; potential disturbance to toxic substances during facility demolition and renovation; and some potential overlap with active ERP sites. In combination with construction, demolition, and renovation under the reasonably foreseeable actions identified in **Table 3-51**, short-term, minor, adverse, cumulative impacts would be expected on hazardous materials and waste.

Long-term, negligible, adverse impacts would occur from the increased use of hazardous materials and petroleum products and the increased generation of hazardous wastes under Alternative 1 due to the proposed 14 percent increase in aircraft operations. Long-term, negligible to minor, adverse, cumulative impacts would be expected from increased use of hazardous materials and petroleum products and the increased generation of hazardous wastes under Alternative 1 in combination with the reasonably foreseeable actions identified in **Table 3-51**, such as the power generation facility, fuels operations facility, and additional installation development projects.

3.6.3.10 Health and Safety

Long-term, negligible, adverse impacts would be expected from a slight increase in bird/wildlife-aircraft strike hazard potential associated with the proposed 15 percent increase in operations under Alternative 1. Short-term, minor, adverse impacts on occupational safety at MacDill AFB would occur due to increased hazards to personnel and civilians from construction activities, and the presence and operation of associated vehicles and equipment on the installation. If construction for Alternative 1 were to occur simultaneously with construction for any of the reasonably foreseeable actions discussed in **Table 3-51**, short term, minor to moderate, adverse, cumulative impacts would be expected due to increased hazards from construction activities and equipment. Long-term, negligible, adverse, cumulative impacts on fire and emergency services would occur due to potential for increased demand on emergency services from additional personnel under Alternative 1 and the other on-installation projects identified in **Table 3-51**.

3.6.3.11 Air Quality

Implementation of Alternative 1 at MacDill AFB would increase air emissions and impact air quality on and near the installation. Cumulatively, the construction activities associated with Alternative 1 and the other reasonably foreseeable projects would result in short-term, intermittent increases in air pollutant levels during those phases of work. If construction, demolition, and renovation under Alternative 1 is conducted concurrently with the Power Generation Facility, USSOCOM MISO and Special Operations Forces facilities, or other installation development and utility projects, short-term cumulative increases in air emissions on or near the installation would be expected. Additionally, concurrent construction of Alternative 1, combined with the transportation projects proposed near the installation, would result in minor cumulative increases in vehicle emissions from the increase in traffic within the ROI.

Alternative 1 would result in long-term, moderate impacts on emissions. Operation of new facilities on the installation associated with the projects identified in **Table 3-51** and the proposed transportation projects could result in minor air emissions increases from long-term operation of equipment and increased traffic. Therefore, long-term, moderate, adverse, cumulative impacts on air quality would be expected.

3.6.3.12 Environmental Justice and Other Sensitive Receptors

Short-term, minor, adverse, cumulative impacts on environmental justice or sensitive receptor populations could occur from construction and renovation associated with Alternative 1 and reasonably foreseeable actions discussed in **Table 3-51**. Temporary increases in air emissions, noise, and traffic associated with construction and renovation may impact surrounding areas and populations. These impacts would be distributed evenly across the surrounding area and not disproportionately affect disadvantaged or sensitive receptor populations because there would not be an increased exposure to environmental health or safety risks.

3.6.4 Alternative 2 – Fairchild AFB

This section evaluates the cumulative effects from Alternative 2 at Fairchild AFB when combined with the reasonably foreseeable actions identified in **Table 3-52**. **Table 3-54** provides a summary of the cumulative effects. As shown in this table, the MOB 6 beddown at Fairchild AFB, when combined with other reasonably foreseeable projects that would be constructed and/or operated concurrently, would not result in cumulatively significant impacts on any resource areas carried forward for analysis in this EIS.

Table 3-54. Summary of Cumulative Effects for Alternative 2 at Fairchild AFB

Resource Area	Alternative 2	Reasonably Foreseeable Actions	Cumulative Effects
Noise	◘	◘	◘
Biological Resources	◘	○	◘
Cultural Resources	○	○	○
Socioeconomics	+	+	+
Soils and Geology	◘	◘	◘
Water Resources	◘	◘	◘
Infrastructure and Transportation	◘	◘ +	◘ +
Land Use	◘ +	○	◘ +
Hazardous Materials and Waste	◘	○	◘
Health and Safety	◘ +	◘ +	◘ +
Air Quality	◘	◘	◘
Environmental Justice and Other Sensitive Receptors	○	◘	◘

Key: ○ = negligible or no impacts; ◘ = minor to moderate impacts that are not significant; ● = significant impacts; **+ =** beneficial impacts

3.6.4.1 Noise

Localized, short-term, minor, adverse impacts on the noise environment would be expected under Alternative 2 due to noise generated from heavy equipment used during construction. When conducted concurrently with any of the reasonably foreseeable actions identified in **Table 3-52**, these impacts would be slightly greater. BMPs implemented for Alternative 2 and other on-installation projects would help reduce potential impacts on the noise environment. These impacts would be temporary and minor. Long-term, minor, adverse impacts on the noise environment would be expected due to the increased acreage exposed to the 65+ dBA DNL contours for KC-46A operations on the installation. In combination with operation of new facilities and infrastructure as identified in the Installation Development Environmental Assessment (IDEA), cumulative impacts would likely be slightly greater, but still less than significant.

3.6.4.2 Biological Resources

The overlap of projects identified in the Fairchild AFB IDEA project with Alternative 2 would contribute to noise and potential vegetation and habitat loss. The overall cumulative impact would be expected to be minor.

3.6.4.3 Cultural Resources

No reasonably foreseeable actions identified in **Table 3-52** have the potential to interact with Alternative 2, if implemented, to impact cultural resources. If, at a later date, it is determined one or more of the reasonably foreseeable actions has the potential to affect cultural resources, the potential for adverse effects under Section 106 would be analyzed for each individual project. It is anticipated that the long-term impacts of Alternative 2 would be negligible under NEPA in conjunction with the identified reasonably foreseeable actions.

3.6.4.4 Soils and Geology

If construction of installation projects listed in **Table 3-52** was to occur simultaneously with Alternative 2, ground disturbance, soil compaction, and erosion associated with the construction efforts would result in minor, cumulative impacts on soils and geology. Due to implementation of BMPs and project-specific and installation ESCPs and SWPPPs, these impacts would be temporary and minor. Long-term, moderate, cumulative impacts would occur due to increased erosion and sedimentation associated with the increase in impervious surfaces from Alternative 2 and other construction projects identified in **Table 3-52** at Fairchild AFB.

3.6.4.5 Socioeconomics

Alternative 2 and the reasonably foreseeable actions identified in **Table 3-52** for Fairchild AFB and the surrounding area could have short- and long-term, minor, beneficial impacts on socioeconomics. Construction activities on Fairchild AFB would have short-term, minor, beneficial socioeconomic impacts through local construction employment and wages, and direct and indirect benefits from local spending. Short- and long-term, minor, beneficial impacts would also be realized from additional state and local infrastructure development in the greater Spokane area.

3.6.4.6 Water Resources

Short-term, negligible to moderate, adverse impacts on groundwater resources could occur at Fairchild AFB due to the potential for construction activities or associated incidental contaminant discharges to intersect with the local groundwater table or result in increased erosion and sedimentation under Alternative 2. In combination with construction under the reasonably foreseeable actions identified in **Table 3-52**, these impacts would be slightly greater.

Long-term, negligible, adverse cumulative impacts on groundwater could occur due to increased demand for potable water associated with the increase in personnel under Alternative 2. In combination with the water well connection, cumulative impacts may be slightly greater. Long-term, moderate, adverse, cumulative impacts on surface water would be expected due to increased erosion and sedimentation from an increase in impervious surfaces associated with Alternative 2 and reasonably foreseeable actions.

3.6.4.7 Infrastructure and Transportation

Alternative 2 and reasonably foreseeable actions at Fairchild AFB and within the surrounding area have the potential to affect the following infrastructure: potable water, liquid fuel supply, stormwater system, communications, solid waste management, liquid fuels supply, airfield, and transportation. Short-term, minor, adverse, cumulative impacts during construction would be anticipated from potential on- and off-installation service interruptions should utility lines need to be rerouted, when a new facility is connected to the distribution systems, or when new utility distribution systems are added.

Renovation of existing infrastructure and construction of new infrastructure on- and off-installation, such as the Intelligence Facility Upgrade, new water distribution line connections, new potable water intertie, new hydrant fueling system, and logistics facility renovation addressed in the IDEA; and the new water well connection would result in long-term, beneficial impacts from upgraded and new utility supply systems, increasing the efficiency of such utility systems at Fairchild AFB. Long-term, negligible, beneficial impacts would also occur on transportation at Fairchild AFB and in the surrounding area from the Brooks Road Crossing, which would alleviate some traffic near Fairchild AFB and reduce potential congestion from the additional personnel under Alternative 2. Additionally, the project to modify Thorpe Gate and Rambo Gate under the IDEA would allow those gates to accommodate more vehicular traffic and increase two-way traffic flow. Overall, implementation of Alternative 2, when combined with other reasonably foreseeable future projects, would not result in a significant cumulative impact on infrastructure or transportation.

3.6.4.8 Land Use

Short-term, minor, adverse, cumulative impacts on Fairchild AFB land use would result from temporary increases in noise levels if any of the other on-installation construction, demolition, or renovation projects listed in **Table 3-52** were to occur simultaneously with Alternative 2. The combined noise levels from these projects and Alternative 2 would not result in areas of additional incompatible land use nor preclude the viability of the existing land uses. Additional short-term, minor, adverse, cumulative impacts could occur from a temporary reduction in

facility, airfield ramp, and hangar availability during any simultaneous construction, demolition, or renovation projects; minimal disruptions to ongoing operations would be expected.

Because all future development on Fairchild AFB would adhere to the IDP, long-term, minor, beneficial, cumulative impacts on Fairchild AFB land use would be expected due to the implementation of Alternative 2 in conjunction with other on-installation reasonably foreseeable projects. These projects would consolidate like functions and increase efficiency, and facility demolition would remove outdated and underused facilities or portions of facilities. Therefore, they would result in an efficient use of installation land and would not conflict with existing or future land uses on the installation.

No cumulative impacts on off-installation land use would be expected because any construction, demolition, or renovation projects on off-installation land would not be expected to interact with Alternative 2, which would be implemented entirely on Fairchild AFB. Apart from Alternative 2, none of projects listed included in **Table 3-52** would result in a change to Fairchild AFB aircraft operations or corresponding land use.

3.6.4.9 Hazardous Materials and Waste

Short-term, minor, adverse impacts would occur under Alternative 2 from the use of hazardous materials and petroleum products; the generation of hazardous wastes during the proposed construction, demolition, and renovation; potential disturbance to toxic substances during facility demolition and renovation; and some potential overlap with active ERP sites. In combination with construction, demolition, and renovation under the reasonably foreseeable actions identified in **Table 3-52**, cumulative impacts would be similar.

Long-term, minor, adverse impacts would occur from the increased use of hazardous materials and petroleum products and the increased generation of hazardous wastes due to the 29 percent increase in aircraft operations. In combination with reasonably foreseeable actions at Fairchild AFB, cumulative impacts would be slightly greater.

3.6.4.10 Health and Safety

Because additional or changed flight operations would not be anticipated under any of the reasonably foreseeable actions, only long-term, negligible to minor, adverse impacts on flight safety and bird/wildlife-aircraft strike hazard would be expected at Fairchild AFB under Alternative 2. Short-term, minor, adverse impacts on occupational safety at Fairchild AFB would occur due to increased hazards to personnel and civilians from construction activities, and the presence and operation of associated vehicles and equipment on the installation. If construction for Alternative 2 were to occur simultaneously with construction for any projects under the IDEA and the water well connection, short term, minor, adverse, cumulative impacts would be expected due to increased hazards from construction activities and equipment. Long-term, negligible, adverse, cumulative impacts on fire and emergency services could occur due to increased demand from additional personnel under Alternative 2 and any additional facilities associated with IDEA projects at Fairchild AFB.

3.6.4.11 Air Quality

Implementation of Alternative 2 at Fairchild AFB would increase air emissions and impact air quality on and near the installation. Cumulatively, the construction activities associated with Alternative 2 and the other reasonably foreseeable projects would result in short-term, intermittent increases in air pollutant levels during those phases of work. If Alternative 2 is constructed concurrently with the water well connection action or other installation development projects, short-term cumulative increases in air emissions on or near the installation would be expected. Additionally, concurrent construction of Alternative 2, combined with the transportation projects proposed near the installation, would result in minor cumulative increases in vehicle emissions from the increase in traffic within the ROI.

Long-term, moderate, adverse, cumulative impacts on air quality would be expected. Alternative 2 would result in long-term, moderate, impacts on emissions. Operation of new facilities on the installation associated with the IDEA and Alternative 2 could result in minor air emissions increases from long-term operation that would reduce air quality in the ROI.

3.6.4.12 Environmental Justice and Other Sensitive Receptors

If any of the IDEA projects, the water well connection project, or the Brooks Road Crossing improvements were to occur concurrently with the Alternative 2, short-term, minor, adverse, cumulative impacts on environmental justice or sensitive receptor populations could occur. Temporary increases in air emissions, noise, and traffic associated with construction and renovation may affect surrounding areas and populations. These impacts would be distributed evenly across the surrounding area and not disproportionately affect disadvantaged or sensitive receptor populations because there would not be an increased exposure to environmental health or safety risks.

3.6.5 Unavoidable Adverse Impacts

NEPA requires an analysis for any potential significant impacts resulting from implementation of a proposed action, including those that can be mitigated to a less than significant level. Unavoidable adverse impacts would result from the Proposed Action. Avoidance, minimization, or mitigation of adverse effects on biological, cultural, and other environmental resources would be implemented to the greatest extent possible and practicable.

Biological Resources. Ground-disturbing activities associated with the construction, renovation, and demolition under the Proposed Action would result in the loss of vegetation and wildlife habitat. These losses would be unavoidable; however, temporarily disturbed sites would be revegetated with native species following construction to support native plant communities and restore wildlife habitat in the long-term. Vegetation and wildlife habitat within the footprint of new impervious surface would be permanently lost.

Energy. The construction, renovation, and demolition activities under the Proposed Action, and proposed increased annual aircraft operations at Fairchild AFB, would require the use of fossil fuels, a non-renewable natural resource. The use of non-renewable resources is an unavoidable occurrence, although not considered significant.

Hazardous Materials and Wastes. The use and generation of hazardous materials and wastes during construction, renovation, and demolition would be unavoidable; however, the hazardous materials and wastes would be handled in accordance with federal, state, and local policies and would not be expected to result in significant impacts.

3.6.6 Compatibility with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The KC-46A MOB 6 beddown at either installation would occur on government-owned lands that DAF operates. The proposed construction, renovation, and demolition, and long-term operations associated with the Proposed Action and alternatives would not differ from the current activities occurring at either installation. DAF would continue to follow all requirements related to installation development and would therefore be consistent with current federal, regional, state, and local land use policies and controls. The Proposed Action and alternatives would not conflict with any applicable off-installation land-use ordinances and would follow all applicable permitting, building, and safety requirements. After the arrival of the KC-46A at either installation and commencement of KC-46A operations, DAF would monitor aircraft noise and collect additional flight data to update the AICUZ study. Based on the results of the refined or validated projected noise footprints, DAF would coordinate with local county and city land use planners to update current planning documents as needed.

3.6.7 Relationship between Short-Term Uses of the Human Environment and Maintenance and Enhancement of Long-Term Productivity

CEQ regulations (40 CFR Part 1502.16) specify that environmental analysis must address "…the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Short-term uses of the biophysical components of the human environment include direct, project-related disturbances and direct impacts associated with an increase of population and activity that occurs over less than 5 years. Long-term uses of the human environment include those impacts occurring over more than 5 years, including permanent resource loss.

The Proposed Action and alternatives would not require short-term resource uses that would result in long-term compromises of productivity. Although construction and renovation projects associated with the MOB 6 beddown could result in an increase of impervious surface, it would not result in intensification of land use at either installation or within the surrounding areas, as most projects would occur within previously developed or disturbed areas and KC-46A operations would be similar in intensity and type to existing KC-135 operations.

Implementation of the Proposed Action is not expected to result in the types of impacts that would reduce environmental productivity, affect biodiversity, or permanently narrow the range of beneficial uses of the environment.

3.6.8 Irreversible and Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses to identify "...any irreversible or irretrievable commitments of resources that would be involved in the proposal should it be implemented" (40 CFR Part 1502.16). Irreversible and irretrievable resource commitments are

related to the use of nonrenewable resources and the effects the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable timeframe. Building construction material, such as gravel and fuel usage for construction equipment, would constitute the consumption of non-renewable resources. Irretrievable resource commitments also involve the loss in value of an affected resource that cannot be restored because of the action.

For the KC-46A MOB 6 beddown, most resource commitments would be neither irreversible nor irretrievable. Most impacts would be short term and temporary (e.g., air emissions from construction), or longer lasting but negligible (e.g., meeting housing demand for proposed personnel increases on- or off-installation). Those limited resources that could involve a possible irreversible or irretrievable commitment would be used in a beneficial manner.

Construction and renovation of installation facilities and infrastructure would require the consumption of limited amounts of material typically associated with interior renovations (wiring, insulation, windows, drywall) and exterior construction (concrete, steel, sand, mortar, brick, asphalt). An undetermined amount of energy to conduct construction, renovation, demolition, and operation of these facilities would be expended and irreversibly lost, but energy would be used in an efficient and sustainable manner throughout the useful life cycle of the facilities.

Training operations would continue to involve the consumption of nonrenewable resources, such as gasoline used in vehicles and jet fuel used in the KC-46A and other aircraft. None of these activities is expected to significantly decrease the availability of mineral or petroleum resources. Personal vehicle use by the new personnel and those continuing to support the existing missions would consume fuel, oil, and lubricants. The amount of these materials used would increase slightly; however, this additional use is not expected to significantly affect the availability of the resources in any alternative's region or the nation.

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6 Glossary

92nd Air Refueling Wing (92 ARW): A DAF unit based out of Fairchild AFB consisting of the Operations, Maintenance, Mission Support, and Medical Groups; 12 Wing staff agencies; 366th Training Group and the DAF's SERE school; and several other tenant organizations.

141st Air Refueling Wing: An Air National Guard unit with both a federal and state mission. When gained by Air Mobility Command, the federal mission is to train, equip and deploy quality mobility forces to forward operating locations in support of specific contingency plans and other short-notice taskings. Under order of the Governor of the State of Washington, the wing provides protection of life and property and preserves peace, order, and public safety.

A-weighted decibel (dBA): Decibel measurement on the "A-weighting" scale. A decibel adjusted (weighted) to reflect the relative loudness of sounds most sensitive to human ears.

Above Ground Level (AGL): Altitude expressed in feet measured above the ground surface.

Accident Potential Zone (APZ): An area near a runway that is based on historical military accident and operations data, and the application of a margin of a safety that represents those areas where an accident is most likely to occur. APZs are normally 3,000 feet wide and extend up to 15,000 feet from the end of the runway.

Advisory Council on Historic Preservation (ACHP): An independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources, and advises the President and Congress on national historic preservation policy.

Air Force Instruction (AFI): Instructions implementing U.S. laws and regulations and providing policy for DAF personnel and activities.

Air Force Reserve Command (AFRC): A major command of the DAF, consisting of commissioned officers and enlisted airmen, serving as the federal Air Reserve Component of the DAF.

Air Installation Compatible Use Zone (AICUZ): A land-use-planning program, used by the military, to protect the health, safety, and welfare of those living near military airfields while preserving the defense flying mission. AICUZ presents noise zones and APZs for military airfields, and recommendations for compatible land use.

Air National Guard (ANG): A federal military reserve force of the DAF, as well as the air militia of each U.S. state, the District of Columbia, the Commonwealth of Puerto Rico, and the territories of Guam and the U.S. Virgin Islands.

Air Mobility Command (AMC): A major command with headquarters at Scott Air Force Base, Illinois. AMC executes Rapid Global Mobility and enables Global Reach (i.e., the ability to respond anywhere in the world in a matter of hours). This is accomplished through AMC's four core mission areas: Airlift, Air Refueling, Air Mobility Support, and Aeromedical Evacuation.

Air Quality: The degree to which the ambient air is pollution-free, assessed by measuring several indicators of pollution.

Anti-terrorism/Force Protection: Requirements for design of facilities on military installations to improve security, minimize fatalities, and limit damage to facilities in the event of a terrorist attack.

Asbestos-containing Material (ACM): Any material containing more than 1 percent asbestos.

Bald and Golden Eagle Protection Act (BGEPA): A federal act that prohibits the take, possession, or transport of bald eagles; golden eagles; and the parts (e.g., feathers, body parts), nests, and eggs without authorization from USFWS.

Beddown: The provision of facilities and other necessary infrastructure to support a new mission or weapon system.

Bird/Wildlife-Aircraft Strike Hazard (BASH): A DAF program to reduce the possibilities of bird or wildlife collisions with aircraft.

Boom Operator: An aircrew member aboard tanker aircraft who is responsible for safely and effectively transferring aviation fuel from one military aircraft to another during flight.

Candidate Species: The ESA defines the term “candidate species” as one where substantial information exists to support proposals to list as endangered or threatened.

Clean Air Act: This Act empowered the USEPA to establish standards for common pollutants that represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety to protect public health and safety.

Clean Water Act: The primary federal law in the United States governing water pollution. The Clean Water Act established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution, and ensuring that surface waters would meet standards necessary for human sports and recreation.

Clear Zone (CZ): An APZ constituting the innermost portions of the runway approach.

Community of Comparison: The smallest jurisdiction for which U.S. Census Bureau data that encompass the footprint of impacts for each resource and is used to establish appropriate thresholds for the impacts analysis.

Council on Environmental Quality (CEQ): The CEQ is within the Executive Office of the President and is composed of three members appointed by the President, subject to approval by the Senate. Members are to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs of the nation; and to formulate and recommend national policies to promote the improvement of environmental quality.

Criteria Pollutants: The six pollutants that are the main indicators or air quality, including carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, suspended particulate matter, and lead.

Critical habitat: Habitat deemed by the USFWS as essential to the conservation of a federally threatened or endangered species.

Day-Night Average Sound Level (DNL): The average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels from 10 p.m. to 7 a.m.

Decibel (dB): A unit used to express the intensity of a sound wave, equal to 20 times the common logarithm of the ratio of the pressure produced by the sound wave to a reference pressure, usually 0.0002 microbar.

***De Minimis* Threshold:** The minimum threshold for which a conformity determination must be performed for various criteria pollutants in various areas.

Endangered Species: The ESA of 1973 defined the term "endangered species" to mean any species (including any subspecies of fish, wildlife, or plants; and any distinct population segment of any species of vertebrate fish or wildlife that interbreeds when mature) that is in danger of extinction throughout all or a significant portion of its range.

Environmental Justice: Pursuant to EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, review must be made as to whether a federal program, policy, or action presents a disproportionately high and adverse human health or environmental effect on minority and/or low-income populations.

Environmental Justice Community: Minority or low-income environmental justice communities should be identified if the percentage of persons characterized as being a minority or low-income populations within the region of influence is either greater than 50 percent or is meaningfully higher than the community of comparison. CEQ also states, "A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds".

Equivalent Sound Level (L_{eq}): The average sound level in dB.

Fiscal Year (FY): U.S. government accounting year beginning October 1 through September 30.

Floodplain: An area of low-lying ground adjacent to a river, formed mainly of river sediments and subject to flooding.

Groundwater: Water held underground in the soil or in pores and crevices in rock.

Hazardous Material: Solids, liquids, or gases that can harm people, other living organisms, property, or the environment.

Hazardous Waste: Waste that poses substantial or potential threats to public health or the environment. In the United States, the treatment, storage, and disposal of hazardous waste is regulated under the RCRA.

Joint Land Use Study (JLUS): A JLUS is a cooperative land use planning effort between military installations and surrounding communities that examines the positive and negative impacts that military installations have on surrounding communities, and vice versa.

Low-income Population: Low-income populations are defined as individuals whose income is below the federal poverty threshold based on income data collected in the 2016-2020 American Community Survey.

Main Operating Base (MOB): A permanently manned, well-protected base with robust infrastructure. MOBs are characterized by command and control structures, enduring family support facilities, and strengthened force protection measures.

Maximum Sound Level (L_{max}): Maximum sound level in decibels (dB).

Mean Sea Level (MSL): Altitude expressed in feet measured above average sea level.

Migratory Bird Treaty Act (MBTA): A federal act enacted to protect migratory birds and their parts.

Minority Population: Minority populations are defined as members of the following population groups: Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and multi race that includes one of the aforementioned races; and Hispanic or Latino. The U.S. Census Bureau considers race and Hispanic or Latino origin (ethnicity) as two separate concepts, and these data are recorded separately.

Mobile Sources: Includes cars and light trucks, heavy trucks and buses, nonroad engines, equipment, and vehicles.

National Ambient Air Quality Standards (NAAQS): NAAQS are established by the USEPA for criteria pollutants that represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect public health and safety.

National Environmental Policy Act (NEPA): The NEPA of 1969, updated in 2020 and amended in 2022, directs federal agencies to take environmental factors into consideration in their decisions.

National Historic Preservation Act (NHPA): The NHPA of 1966, as amended, established a program for the preservation of historic properties throughout the United States.

National Register of Historic Places (NRHP): The NRHP is the federal government's official list of districts, sites, buildings, structures, and objects deemed worthy of preservation.

Noise Contour: Noise contours are a series of lines superimposed on a map of the airport's environs. These lines represent various DNL levels, typically 65 through 85 dBA.

NOISEMAP: A suite of computer programs and components developed by the DAF to predict noise exposure near an airfield due to aircraft flight, maintenance, and ground run-up operations.

Operation: An aircraft operation consists of a single activity such as a landing or a takeoff by one aircraft.

Power Setting: The power or thrust output of an engine in terms of kilonewtons thrust for turbojet and turbofan engines, or shaft power in terms of kilowatts for turboprop engines.

Primary Aerospace Vehicle Authorization (PAA): PAA consists of the aircraft authorized and assigned to perform a DAF wing's mission.

Prime Farmland: Prime farmland is a designation assigned by the USDA for land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The land is also used as cropland, pastureland, rangeland, forest land, or other land, but cannot be used as urban built-up land or water

Sensitive Receptor: Populations, such as child and elderly, that have the potential to be more susceptible than other populations to certain environmental impacts and risks.

Scoping: A NEPA process of identifying the main issues of concern at an early stage in planning to discover any alternatives and aid in site selection.

Sound Exposure Level (SEL): A measure of the total energy of an acoustic event. It represents the level of a 1-second-long constant sound that would generate the same energy as the actual time-varying noise event, such as an aircraft overflight. SEL provides a measure of the net effect of a single acoustic event, but it does not directly represent the sound level at any given time.

State Historic Preservation Office(r) (SHPO): State department responsible for assigning protected status for cultural and historic resources.

Take (under ESA): The ESA also prohibits any action that causes a "take" of any listed species. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Threatened Species: A species likely to become endangered within the foreseeable future throughout all, or a significant portion, of its range.

Total Force Integration (TFI): A concept that was enacted into law through the passage of the 2008 National Defense Authorization Act, which pairs two DAF component units (host and associate) together to operate as one.

Traditional Cultural Property: A historic property that I NRHP-eligible due to its association with cultural practices or beliefs of a living community that are rooted in the said community's history and are important in maintaining the continuing cultural identity of the community.

MOB6

KC-46A MAIN OPERATING BASE NO.6 BEDDOWN

HEADQUARTERS AIR MOBILITY COMMAND