DRAFT

ENVIRONMENTAL ASSESSMENT

For

FIREFIGHTER TRAINING FACILITY

At

MARINE CORPS BASE CAMP BLAZ, FINEGAYAN, GUAM

July 2023

This page intentionally left blank.

Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Firefighter Training Facility
Project Location:	Marine Corps Base Camp Blaz, Guam
Lead Agency for the EA:	Commander, Joint Region Marianas
Affected Region:	Finegayan, Guam
Action Proponent:	Marine Corps Base Camp Blaz
Point of Contact:	EV21 Project Mgr., Firefighter Training Facility EA Email: GuamFFTF@hhf.com Naval Facilities Engineering Systems Command, Pacific 258 Makalapa Drive, Suite 100 Joint Base Pearl Harbor-Hickam, HI 96860-3134
Date:	July 2023

Marine Corps Base Camp Blaz, a Command of the U.S. Navy (hereinafter, referred to as the Navy) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing NEPA. The Proposed Action would construct and operate a Firefighter Training Facility (FFTF). The FFTF would be constructed to include a six-story training tower, firefighter training mockups, an Emergency Vehicle Operations Course, and a covered observation/control facility to meet National Fire Protection Association 1402 standards. Construction is proposed to begin in 2024 and is expected to be completed within two years. This EA evaluates the potential environmental impacts associated with two action alternatives (including a Preferred Alternative) and the No Action Alternative to the following resource areas: visual resources, cultural resources, terrestrial biological resources, noise, water resources, air quality and greenhouse gases, hazardous materials and hazardous wastes, public health and safety, and environmental justice.

This page intentionally left blank.

EXECUTIVE SUMMARY

ES.1 Proposed Action

Marine Corps Base (MCB) Camp Blaz, a Command of the U.S. Navy (hereinafter, referred to as the Navy) proposes to construct and operate a Firefighter Training Facility (FFTF) at MCB Camp Blaz to support the MCB Camp Blaz Fire Department personnel in meeting the Commander, Navy Installations Command (CNIC) mandatory training and certification requirements. CNIC requirements indicate that the FFTF is critical to provide necessary fire protection and emergency services to MCB Camp Blaz. The Proposed Action would consist of the construction and operation of four training facilities: 1) an emergency vehicle operator course (EVOC), 2) a six-story enclosed firefighter training tower, 3) firefighter training mockups, and 4) a covered observation/control facility. All facilities would be constructed to meet the National Fire Protection Association (NFPA) 1402 standards. The six-story training tower would be the only NFPA-compliant facility on Guam to provide necessary ladder truck operations training required by CNIC. Construction of the Proposed Action would require the demolition of existing facilities at the selected project site. Construction is proposed to begin in 2024 and is expected to be completed within two years. The FFTF's footprint would be approximately eight acres (3.2 hectares) and located within the MCB Camp Blaz installation boundary.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide an NFPA-compliant FFTF at MCB Camp Blaz for Fire Department personnel to meet mandatory CNIC training and certification requirements, as well as to meet the Aggregate Response Time (ART) required by Department of Defense Instruction (DoDI) 6055.06. The FFTF is critical to ensure all MCB Camp Blaz firefighting personnel maintain proficiency and can operate safely and effectively in all capabilities required per the installation's scope of services, in support of the relocation of forces from Okinawa, Japan.

Several six-story bachelor enlisted quarters and bachelor officer quarters are currently being constructed at MCB Camp Blaz. Currently, there is no multistory firefighting training tower on Guam that would serve the purpose of training firefighters to respond to fires at six-story facilities. Thus, a six-story training tower is needed to provide ladder truck operation training in accordance with NFPA 1402 Standard. NFPA 1402 Standard also requires 11 training mockups, an EVOC, and a covered observation/control facility.

Firefighters remain in a "response status" during training. DoDI 6055.06 Section 7.2, Table 1 establishes a seven-minute ART for emergency fire response. Therefore, the FFTF components need to be co-located within the MCB Camp Blaz installation boundary, in order to meet the DoDI 6055.06 response time requirement. Co-locating all of the training components in one location would also provide operational and cost efficiency.

ES.3 Screening Factors

Alternative sites were proposed for analysis based upon the following site selection screening factors:

- Outside wellhead protection areas as outlined in Title 22 Guam Administrative Rules Guam Environmental Protection Agency, Chapter 7, Section 7130 (Water Resources Development and Operating Regulations)

- Not within unique geological features (i.e., sink holes with significant aquifer recharge features)
- Compatible with installation land use plan
- Within a seven-minute response radius of MCB Camp Blaz as outlined in DoDI 6055.06

The Navy is considering two action alternatives that meet the purpose of and need for the Proposed Action.

Alternative 1 (Preferred Alternative) would involve construction and operation of the FFTF on an approximately eight-acre parcel at the south end of MCB Camp Blaz on the Andreen Softball Field (Figure ES-1). The site is within the MCB Camp Blaz installation boundary adjacent to Route 3. The existing softball field, associated structures, and the adjacent tennis courts would be demolished. The existing concrete road surface to the site would be hardened to accommodate the increased weight and traffic of fire and emergency vehicles. New utility lines would be constructed to connect the proposed FFTF to utility points of connection within MCB Camp Blaz.

Alternative 2 would involve construction and operation of the FFTF on an approximately eight-acre parcel at the northeastern extent of the MCB Camp Blaz. The site is within the MCB Camp Blaz installation boundary, adjacent to Potts Junction (i.e., the intersection of Route 3 and Route 3A) (Figure ES-1). The site is currently forested, so this alternative would require the land to be cleared and graded. This alternative would also include new utility connections to existing connection points within MCB Camp Blaz.

The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA the No Action Alternative is also carried forward for analysis in this Environmental Assessment (EA). The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline for analysis.

Under the No Action Alternative, the Proposed Action would not occur and no FFTF would be constructed. MCB Camp Blaz Fire Department personnel would conduct their training in compliance with interim training measures established for MCB Camp Blaz. Since there are no multistory FFTFs on Guam to support ladder training, they would be forced to conduct ladder training on existing multistory non-FFTF buildings throughout Joint Region Marianas (JRM). They would conduct live-firefighting training at existing FFTFs at Andersen Air Force Base (AAFB) or Naval Base Guam (NBG). The live-firefighting training facilities at NBG and AAFB are dated and plagued with mechanical challenges, and they are located outside of the seven-minute response time to MCB Camp Blaz as required under DoDI 6055.06. This would result in an unacceptable risk to personnel and property at MCB Camp Blaz, in the event of a fire or other emergency during training activities.

ES.4 Summary of Environmental Resources Evaluated in the EA

An EA should discuss impacts in proportion to their potential environmental effects, with only a brief discussion of impacts on resource areas that are negligible or nonexistent. Thus, this EA does not evaluate airspace, geological resources, infrastructure, land use or socioeconomics because the Proposed Action would have little to no impact on these resources. The Proposed Action has the potential to impact the following resource areas, which are discussed in more detail in the EA: visual resources, cultural resources, terrestrial biological resources, noise, air quality and greenhouse gases, water resources, hazardous materials and hazardous wastes, public health and safety, and environmental justice.

Figure ES-1: Location Map

ES.5 Public Involvement

Council on Environmental Quality regulations direct agencies to involve the public in preparing and implementing their NEPA procedures.

The Navy has prepared this Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The Draft EA review period begins with a public notice published in the Pacific Daily News indicating the availability of the Draft EA and the locations where public review copies are available. The notice of availability of the Draft EA will also be distributed to the government agencies and community stakeholders identified in Chapter 8. Additionally, a notice of availability of the Draft EA will be published on MCB Camp Blaz's social media accounts. The Navy postponed the release of the Draft EA from June 2023 to mid-July 2023, due to Typhoon Mawar disaster relief efforts on the island of Guam, to ensure the public will be afforded a timelier opportunity to review the Draft EA.

Following the publication of the notice of availability, the Draft EA will be available for public review and comment for 30 days. This review period has been extended from a minimum of 15 days to ensure that there is sufficient opportunity for the public to provide their comments. During the public comment period, printed copies of the Draft EA will be made available at the Dededo Public Library and the University of Guam Robert F. Kennedy Library. The Draft EA will also be made available for viewing and download on the following website: https://pacific.navfac.navy.mil/About-Us/National-Environmental-Policy-Act-NEPA-Information/

During the public review period, the Navy is planning to meet with local agencies and officials, including, but not limited to, the Guam Governor's office and the Guam Environmental Protection Agency.

ES.6 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a summary of the potential impacts to the resources associated with each of the alternative actions analyzed.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Visual Resources	No impact	Less than significant impacts Vertical elements of the Preferred Alternative would be visible from Route 3. The six-story training tower, and to a lesser extent, the two-story observation/control facility and security fence line would be noticeable to pedestrians, motorists, and residents along Route 3. The six-story training tower would be similar in scale to the elevated NCTS water tanks along Route 3, and the two-story observation/control facility would be of a similar scale to other existing buildings in the area. These newly introduced visual elements would not appreciably degrade visual resources and would be consistent with the character and type of development in the southern portion of MCB Camp Blaz (i.e., the former NCTS) visible from Route 3.	Less than significant impacts Alternative 2 would be partially visible from Route 3. Since the Alternative 2 project area is currently forested, the development of the FFTF and the six-story training tower would generate a moderate visual contrast to the surrounding forested areas. However, the lands directly east of the project area have already been cleared for MCB Camp Blaz. The remaining forested area would help to screen views into the site from Route 3A and portions of Route 3. Thus, the overall visual impacts would be minimal.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Cultural Resources	No impact	No significant impacts The potential to encounter cultural resources in the Preferred Alternative area of potential effect (APE) is low. Geospatial analysis concluded that the entirety of this area was graded to bedrock due to mid-20th century military construction. Cultural artifacts, recovered from disturbed contexts during grubbing and clearing for MCB Camp Blaz, are currently located in a temporary storage location within the APE. These artifacts will be relocated to a publicly accessible location at the MCB Camp Blaz main gate. These artifacts will be installed with informational signage and other necessary interpretive features with language consulted upon with the Guam SHPO per Part VIIb.1 of the 2011 Guam PA. As is required under the 2011 Guam PA, the Navy prepared a PA memo documenting its proposed finding of No Historic Properties Affected for the Preferred Alternative. The memo was submitted to the Guam SHPO on March 27, 2023.	Less than significant impacts Site 66-08-2305, a former Seabee encampment, is located within the Alternative 2 project area. This site was partially removed by the construction of Marine Corps Base Camp Blaz (Project J-001B). At that time, the Navy completed data recovery for the entire site to mitigate adverse effects. Construction of Alternative 2 would result in further impacts to Site 66-08-2305, including the removal of Features 2 (former fuel pipeline), 3a (refuse dump), and 4 (naval artillery round crater). These features appear to have been undisturbed by Project J-001B. Prior to implementation, the Navy would initiate consultation with the Guam SHPO under the 2011 PA to mitigate potential adverse effects from Alternative 2. Since data recovery was already completed for the entire site under Project J001-B, no further data recovery would be necessary. Additional mitigation measures would likely include performing archaeological monitoring consistent with the 2018 Dispute Resolution agreement between Joint Region Marianas and the Guam SHPO.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Terrestrial Biological Resources	No impact	Less than significant impacts The Preferred Alternative would be located primarily on previously developed land, but it would include clearing of approximately 0.1 acres (0.04 hectares) of degraded limestone forest. Potential effects on migratory birds and the Mariana fruit bat would be minimized by implementing BMPs including pre-construction surveys and shielded lighting. In accordance with Section 7 of the ESA, the Navy conducted formal consultation with the USFWS. The Navy determined the project is likely to adversely affect the Mariana fruit bat (Appendix B).	Less than significant impacts Alternative 2 would be located in an existing forested area and would require clearing of 0.5 acres (0.2 hectares) of *Spathodea* forest, and 7.2 acres (2.9 hectares) of *Vitex* forest. There are nine high value trees (*Elaeocarpus joga*) within the footprint that would be removed. One federal special status species was identified within the Alternative 2 footprint during surveys in 2015: five *Tuberolabium guamense* orchids growing on non-native *Vitex parviflora* trees. Healthy *Tuberolabium guamense* individuals would be transplanted into protected areas where feasible. Potential effects on migratory birds and the Mariana fruit bat would be minimized by implementing the same BMPs as for the Preferred Alternative.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Noise	No impact	Less than significant impacts Construction would result in short-term increases in daytime noise. The estimated construction noise levels for the nearest residences along Route 3 would be similar to existing noise levels from vehicle traffic on Route 3. The estimated construction noise levels at Finegayan Elementary School would be below Guam Department of Public Works Standards for schools. Noise associated with operation of the facility is anticipated to have a negligible effect on the noise environment.	Less than significant impacts Construction would result in short-term increases in daytime noise. The estimated construction noise levels for the nearest residences along Route 3 and the Starts Guam Golf Resort would be below Guam Department of Public Works Standards for residences and active sports facilities. Noise associated with operation of the facility is anticipated to have a negligible effect on the noise environment.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Water Resources	No impact	Less than significant impacts Water usage during the construction and operational period would be negligible when compared with the overall MCB Camp Blaz demand for water and would be well within the estimated available yield for the Finegayan sub-basin of the Northern Guam Lens Aquifer. The new facilities would be designed based on the principles of LID and would not increase stormwater runoff from the project site into adjacent areas. Erosion control BMPs would be implemented during construction in compliance with applicable permits. Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system.	Less than significant impacts Water usage during the construction and operational period would be negligible when compared with the overall MCB Camp Blaz demand for water and would be well within the estimated available yield for the Finegayan sub-basin of the Northern Guam Lens Aquifer. The new facilities would be designed based on the principles of LID and would not increase stormwater runoff from the project site into adjacent areas. Erosion control BMPs would be implemented during construction in compliance with applicable permits. Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Air Quality and Greenhouse Gases	No impact	Less than significant impacts Air emissions would be generated during both the construction and operational period (e.g., fugitive dust, combustion of fossil fuels for equipment, burning of fuels for live-firefighting trainings, etc.). Anticipated air quality impacts are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. GHG emissions would have a negligible effect on Guam's overall contribution to GHG emissions.	Less than significant impacts Air emissions would be generated during both the construction and operational period (e.g., fugitive dust, combustion of fossil fuels for equipment, burning of fuels for live-firefighting trainings, etc.). Anticipated air quality impacts are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. GHG emissions would be greater than for the Preferred Alternative, but would still have a negligible effect on Guam's overall contribution to GHG emissions.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Hazardous Materials and Hazardous Wastes	No impact	Less than significant impacts Existing structures associated with the Andreen Softball Field could contain special hazards (i.e., asbestos or lead-based paint). Operations of the FFTF would include the storage of propane in an aboveground tank. This storage tank would be constructed and maintained in compliance with all applicable federal regulations. Propane would be connected to the live-firefighting props via underground gas piping and dispensed through certified burn pans. Some training exercises would utilize Class A materials (i.e., raw, untreated wood or hay) as fuel. Once the training fire is extinguished, any remaining ash or debris would be swept up and disposed of with regular solid wastes (i.e., dumpster). Operations of the FFTF would not involve the use of aqueous film forming foams (AFFF). AFFF was previously used to extinguish fires, but it is now known to contain Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS). The Navy has released Interim Technical Guidance prohibiting the purchase and use of AFFF (Navy, 2022).	Less than significant impacts Construction related impacts are likely to be similar to the Preferred Alternative except that there are no known existing structures at the Alternative 2 project site, and therefore no special hazards (i.e., ACM, LBP and LCP) are likely to be encountered. Operation of the FFTF would be the same as for the Preferred Alternative.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Public Health and Safety	Adverse Impacts Under the No Action Alternative, the proposed FFTF would not be constructed. MCB Camp Blaz Fire Department personnel would be required to conduct their training under interim training measures at existing, non-compliant FFTFs at AAFB or NBG. Additionally, mutual aid partners (i.e., NBG, AAFB, and GovGuam fire departments) would not have access to a multistory training facility to help prepare them for potential fires or other emergencies on multistory buildings throughout the island of Guam.	Beneficial impacts The Preferred Alternative will provide beneficial impacts for MCB Camp Blaz and the larger Guam community through improved firefighter training facilities. Currently, there are no NFPA-compliant multistory firefighter training props on Guam. The Proposed Action includes a six-story training tower which will provide similar compatible training environments to the six-story BEQs on MCB Camp Blaz and other multistory buildings on Guam. Mutual aid partners will be invited to use the FFTF for training alongside MCB Camp Blaz firefighters.	Beneficial impacts Alternative 2 will provide the same beneficial impacts as the Preferred Alternative.
Environmental Justice	No Impact	Less than significant impacts The Preferred Alternative would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.	Less than significant impacts Alternative 2 would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Key: AAFB = Andersen Air Force Base; AAQS = Ambient Air Quality; APE = Area of potential effect; BEQ = Bachelor Enlisted Quarter; BMP = Best Management Practice; BO = Biological Opinion; CNIC = Commander, Navy Installations Command; ESA = Endangered Species Act; FFTF = Firefighter Training Facility; GHG = Greenhouse Gas; HAP = Hazardous Air Pollutants; LID = Low Impact Development; GovGuam = Government of Guam; MBTA = Migratory Bird Treaty Act; MCB = Marine Corps Base; NBG = Naval Base Guam; NCTS = Naval Computer and Telecommunications Station; NFPA = National Fire Protection Agency; NRHP = National Register of Historic Places; NHPA = National Historic Preservation Act; PA = Programmatic Agreement; USFWS = United States Fish and Wildlife Service

Environmental Assessment for FIREFIGHTER TRAINING FACILITY at MARINE CORPS BASE CAMP BLAZ, FINEGAYAN, GUAM

TABLE OF CONTENTS

List of Figures

List of Tables

Appendices

Abbreviations and Acronyms

Acronym	Definition
AAFB	Andersen Air Force Base
AAQS	Ambient air quality standard
APE	Area of Potential Effects
ART	Aggregate Response Time
ATFP	Antiterrorism Force Protection
BEQ	bachelor enlisted quarters
BMP	best management practice
BO	Biological Opinion
CAA	Clean Air Act
CCD	Coastal Consistency Determination
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	Carbon dioxide equivalent
CNIC	Commander, Navy Installations Command
CNMI	Commonwealth of the Northern Mariana Islands
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DoD	United States Department of Defense
DoDI	Department of Defense Instruction
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EIAMD	Enhanced Integrated Air and Missile Defense
EO	Executive Order
ESA	Endangered Species Act
EVOC	Emergency Vehicle Operator Course
FAA	Federal Aviation Administration
FFTF	Firefighter Training Facility
FONSI	Finding of No Significant Impact
GBSP	Guam Bureau of Statistics and Plans
GEPA	Guam Environmental Protection Agency
GHG	greenhouse gases
GovGuam	Government of Guam
GWNR	Guam National Wildlife Refuge
GWP	global warming potential
HAP	hazardous air pollutant
IPCC	Intergovernmental Panel on Climate Change
IRP	Installation Restoration Program
JGPO	Joint Guam Program Office
JRM	Joint Region Marianas
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
MCB	Marine Corps Base
MCO	Marine Corps Order
MDA	Missile Defense Agency
MGd	million gallons per day
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NBG	Naval Base Guam
NCTS	Naval Computer and Telecommunications Station

Acronym	Definition
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Agency
NHPA	National Historic Preservation Act
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NOA	notice of availability
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction
PCB	polychlorinated biphenyl
PIRCA	Pacific Islands Regional Climate Assessment
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
ppm	parts per million
RCP	Representative Concentration Pathway
RFFA	Reasonably Foreseeable Future Action
ROD	Record of Decision
ROI	region of influence
SEIS	Supplemental Environmental Impact Statement
SEL	sound exposure level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCS	Space Control Squadron
tpy	tons per year
U.S.	United States
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps

This page intentionally left blank.

1 Purpose of and Need for the Proposed Action

This section introduces the project, provides background context, and describes the project location, purpose and need, scope of analysis, relevant laws and regulations, and public and agency participation.

1.1 Introduction

Marine Corps Base (MCB) Camp Blaz, a Command of the United States (U.S.) Navy (hereinafter, referred to as the Navy) proposes to construct and operate a Firefighter Training Facility (FFTF) at MCB Camp Blaz. The Proposed Action would consist of the construction and operation of four training facilities: 1) an emergency vehicle operator course (EVOC), 2) a six-story enclosed firefighter training tower, 3) firefighter training mockups, and 4) a covered observation/control facility. Construction of the Proposed Action would require the demolition of existing facilities at the selected project site. Construction is proposed to begin in 2024 and is expected to be completed within two years. The FFTF's footprint would be approximately eight acres (3.2 hectares) located within the MCB Camp Blaz installation boundary.

The Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) Regulations, Navy Regulations, and Marine Corps Order (MCO) 5090.2 for implementing NEPA.

1.2 Background

In September 2010, the Navy signed a Record of Decision (ROD) regarding the 2010 Final Environmental Impact Statement (EIS) for the Guam and the Commonwealth of the Northern Mariana Islands (CNMI) Military Relocation. The 2010 EIS evaluated a range of facilities and infrastructure associated with relocation of Marine Corps forces and dependents from Okinawa, Japan to Guam. The 2010 ROD included a Fire Station per United Facilities Criteria 4-730-10 to provide fire protection services to facilities and personnel aboard MCB Camp Blaz.

In August 2015, the Navy issued a ROD regarding the 2015 Supplemental Environmental Impact Statement (SEIS) for the "2012 Road Map Adjustments," which adopted a new force posture in the Pacific providing for a materially smaller and reconfigured Marine Corps force on Guam. This SEIS evaluated additional alternatives for Marine Corps main cantonment and family housing area to support the scaled down relocation of Marine Corps forces to Guam. The ROD was signed in August 2015 and the DoD has proceeded to implement the Preferred Alternative, including the construction of the main cantonment at MCB Camp Blaz.

In 2019, Commander, Navy Installations Command (CNIC) identified a requirement for an FFTF to satisfy the fire and emergency services training and certification program (F&ESCP) requirement outlined in the Office of the Chief of Naval Operations 11320.23 G CH. 11, MCO 11000.11A, and Department of Defense Instruction (DoDI) 6055.06. The F&ESCP shall be developed to meet the National Fire Protection Association's (NFPA) professional qualifications Standard 1000 and 1072 series, and NFPA 1402 Standard on Facilities for Fire Training and Associated Props, 2019 Edition. Moreover, the F&ESCP shall ensure appropriate training and equipment are provided to prepare firefighters for the scope of emergency services at MCB Camp Blaz.

DoDI 6055.06 also requires a seven-minute Aggregate Response Time (ART) for emergency fire response. Therefore, the FFTF would need to be located within MCB Camp Blaz to allow firefighters to meet the ART requirement during training.

1.3 Location

MCB Camp Blaz is located in the municipality of Dededo Village on the northwestern coast of Guam (Figure 1-1). The Philippine Sea forms the western boundary of MCB Camp Blaz. The installation is bordered to the south by private land. Route 3 forms the eastern boundary of the installation, with Finegayan Elementary School and residential housing areas located directly across from the installation. Route 3A runs along the northern edge of the installation and separates MCB Camp Blaz from Andersen Air Force Base (AAFB) Northwest Field to the north.

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide an NFPA-compliant FFTF at MCB Camp Blaz for Fire Department personnel to meet training, certification, and response time requirements. The FFTF is critical to ensure all MCB Camp Blaz firefighting personnel maintain proficiency and can operate safely and effectively in all capabilities required per the installation's scope of services, in support of the relocation of forces from Okinawa, Japan.

Several six-story bachelor enlisted quarters (BEQs) and bachelor officer quarters are currently being constructed at MCB Camp Blaz. Currently, there is no multistory firefighting training tower on Guam. Thus, a six-story training tower is needed to provide ladder truck operation training in accordance with NFPA 1402 Standard. NFPA 1402 Standard also requires 11 training mockups, an EVOC, and a covered observation/control facility.

Firefighters remain in a "response status" during training. DoDI 6055.06 Section 7.2, Table 1 establishes a seven-minute ART for emergency fire response. Therefore, the FFTF components need to be co-located within the MCB Camp Blaz installation boundary, in order to meet the DoDI 6055.06 response time requirement. Co-locating all of the training components in one location would also provide operational and cost efficiency.

Figure 1-1 Location Map

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed include: visual resources, cultural resources, terrestrial biological resources, noise, water resources, air quality and greenhouse gases, hazardous materials and hazardous wastes, public health and safety, and environmental justice. The project area for each resource analyzed may differ due to how the Proposed Action interacts with or impacts the resource.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole are outlined in Table 1-1.

Table 1-1 Key Documents

Document Title	*Description*
2010 EIS for Guam and CNMI Military Relocation (JGPO, 2010)	To support the buildup of U.S. forces on the island of Guam, the Department of the Navy prepared the Final EIS and ROD for the Guam and CNMI Military Relocation (JGPO, 2010). Volume Two of the 2010 EIS evaluated the potential environmental impacts of the relocation of Marine Corps forces, including several alternative layouts and locations for the proposed Marine Corps main cantonment and family housing area at Finegayan. Guam. The Preferred Alternative included 2,580 acres (1,044 hectares) of land for the development of the main cantonment and family housing area at Finegayan, Guam (including most of the current MCB Camp Blaz and additional surrounding areas).
2015 SEIS for Guam and CNMI Military Relocation (2012 Roadmap Adjustments)	In 2015, JGPO completed an SEIS/ROD that evaluated the potential environmental impacts of several new alternatives for the proposed Marine Corps main cantonment and family housing area. The 2015 SEIS identified a Preferred Alternative that relocated the proposed family housing area to AAFB and reduced the footprint of the proposed main cantonment at Finegayan. The ROD was signed in August 2015 and the DoD has proceeded to implement the Preferred Alternative, including the construction of the main cantonment, which was subsequently named Marine Corps Base Camp Blaz.

Key: CNMI = Commonwealth of the Northern Marianas Islands; JGPO = Joint Guam Program Office; EIS = Environmental Impact Statement; ROD = Record of Decision; MCB = Marine Corps Base; SEIS = Supplemental Environmental Impact Statement; AAFB = Andersen Air Force Base; DoD = Department of Defense

1.7 Relevant Laws and Regulations

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

- American Indian Religious Freedom Act (42 U.S.C. 1996)
- Archaeological and Historic Preservation Act (54 U.S.C. 312501-312508)
- Archaeological Resources Protection Act (16 U.S.C 470aa-470mm)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- EO 12088 as amended, Federal Compliance with Pollution Control Standards
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis
- EO 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136 et seq.)
- Guam Administrative Rules, Chapter 7, Section 7130, Water Resources Development and Operating Regulations
- Guam Air Pollution Control Act (10 GCA Health and Safety, Chapter 49)
- Guam Safe Drinking Water Act (10 GCA Health and Safety, Chapter 53)
- National Historic Preservation Act of 1966, as amended (54 U.S.C. 100101); Programmatic Agreement Among the DoD, The Advisory Council on Historic Preservation, The Guam State Historic Preservation Officer, and CNMI State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian
- Navy regulations for implementing NEPA (32 CFR part 775)
- NEPA; CEQ NEPA implementing regulations; Navy procedures for implementing NEPA (42 U.S.C. § 4331; 40 CFR parts 1500-1508; 32 CFR part 775)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Safe Drinking Water Act (42 U.S.C section 300f et seq.)
- Toxic Substances Control Act (15 U.S.C. sections 2601 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703 et seq.)

A description of the Proposed Action's consistency with these laws, policies and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 5 (Table 5-1).

1.8 Public and Agency Participation and Intergovernmental Coordination

CEQ regulations direct agencies to involve the public in preparing and implementing their NEPA procedures.

The Navy has prepared this Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment. The Draft EA review period begins with a public notice published in the Pacific Daily News indicating the availability of the Draft EA and the locations where public review copies are available. The notice of availability of the Draft EA will also be distributed to the government agencies and community stakeholders identified in Chapter 8. Additionally, notice of availability of the Draft EA will be published on MCB Camp Blaz's social media accounts. The Navy postponed the release of the Draft EA from June 2023 to mid-July 2023, due to Typhoon Mawar disaster relief efforts on the island of Guam, to ensure the public will be afforded a timelier opportunity to review the Draft EA.

Following the publication of the notice of availability, the Draft EA will be available for public review and comment for 30 days. This review period has been extended from a minimum of 15 days to ensure that there is sufficient opportunity for the public to provide their comments. During the public comment period, printed copies of the Draft EA will be made available at the Dededo Public Library and the University of Guam Robert F. Kennedy Library. The Draft EA will also be made available for viewing and download on the following website: https://pacific.navfac.navy.mil/About-Us/National-Environmental-Policy-Act-NEPA-Information/

During the public review period, the Navy is planning to meet with local agencies and officials, including but not limited to the Guam Governor's office and the Guam Environmental Protection Agency.

As is required under Section 106 of the National Historic Preservation Act and the 2011 Programmatic Agreement (PA) Among the DoD, The Advisory Council on Historic Preservation, The Guam State Historic Preservation Officer, and CNMI State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian, the Navy prepared a PA memo documenting its proposed finding of No Historic Properties Affected for the Preferred Alternative. The memo was submitted to the Guam SHPO on March 27, 2023.

In accordance with Section 7 of the Endangered Species Act, the Navy conducted formal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding the Preferred Alternative. The Navy determined that the Preferred Alternative is likely to adversely affect the federally-listed threatened Mariana fruit bat (*Pteropus mariannus mariannus*) in a letter to the USFWS dated May 2, 2023 (see Appendix B).

A Coastal Consistency Determination was prepared and submitted to the Guam Bureau of Statistics and Plans (GBSP), Coastal Management Program. In accordance with the Coastal Zone Management Act the Navy determined that the Preferred Alternative is consistent to the maximum extent possible with the federally approved enforceable policies of the Guam Coastal Management Program. The Navy submitted a Consistency Determination on the Preferred Alternative to GBSP requesting their review and concurrence. The Navy received GBSP's conditional concurrence on this determination via correspondence dated February 20, 2023 (Appendix C).

2 Proposed Action and Alternatives

This chapter includes an overview of the Proposed Action, the alternatives screening process, alternatives carried forward for analysis, and best management practices (BMPs) included in the Proposed Action.

2.1 Proposed Action

Marine Corps Base (MCB) Camp Blaz proposes to construct and operate a Firefighter Training Facility (FFTF) at MCB Camp Blaz to support the MCB Camp Blaz Fire Department personnel in meeting Commander, Navy Installations Command (CNIC) mandatory training and certification requirements. CNIC requirements state that the FFTF is critical to provide necessary fire protection and emergency services to MCB Camp Blaz. The Proposed Action would consist of the construction and operation of four training facilities: 1) an emergency vehicle operator course (EVOC), 2) a six-story enclosed firefighter training tower, 3) firefighter training mockups, and 4) a covered observation/control facility. All facilities must be constructed to meet National Fire Protection Association (NFPA) 1402 standards. Construction of the Proposed Action would require demolition of existing facilities at the chosen alternative project site. Construction is proposed to begin in 2024 and is expected to be completed within two years. The FFTF's footprint would be approximately eight acres (3.2 hectares) and would be located within the MCB Camp Blaz installation boundary.

2.2 Screening Factors

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally Proposed Action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and meet the purpose and need require detailed analysis. Non-geographical alternatives, such as alternative training methods, would not meet the purpose and need for the Proposed Action and were not carried forward for analysis in this EA.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

- Minimize encroachment on wellhead protection areas as outlined in Title 22 Guam Administrative Rules Guam Environmental Protection Agency, Chapter 7, Section 7130 (Water Resources Development and Operating Regulations)
- Not within unique geological features (i.e., sink holes with significant aquifer recharge features)
- Compatible with installation land use planning and operational constraints
- Within a seven-minute response radius of MCB Camp Blaz as outlined in Department of Defense Instruction (DoDI) 6055.06 Section 7.2, Table 1

Various alternatives were evaluated against the screening factors. The alternatives considered include:

- No Action
- Alternative 1 (Preferred Alternative): New FFTF at Andreen Softball Field
- Alternative 2: New FFTF near Potts Junction
- Alternative 3: New FFTF near the MCB Camp Blaz (see Figure 2-4)
- Alternative 4: New FFTF near the MCB Camp Blaz (see Figure 2-4)
- Alternative 5: New FFTF near the MCB Camp Blaz (see Figure 2-4)

2.3 Alternatives Carried Forward for Analysis

Although several possible alternatives were evaluated, as described in Section 2.4, only two reasonable alternatives were identified. Based on the screening factors identified above, two alternatives were carried forward for further analysis; Alternative 1 (Preferred Alternative) and Alternative 2. Alternatives 3-5 were eliminated from further analysis based on the screening factors, as discussed in Section 2.4.

The No Action Alternative will also be carried forward for analysis. The No Action Alternative would not meet the purpose of and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and no FFTF would be constructed. MCB Camp Blaz Fire Department personnel would conduct their training in compliance with interim training measures established for MCB Camp Blaz. Since there are no multistory FFTFs on Guam to support ladder training, they would be forced to conduct ladder training on existing multistory non-FFTF buildings throughout Joint Region Marianas (JRM). They would conduct live-firefighting training at existing FFTFs at Andersen Air Force Base (AAFB) or Naval Base Guam (NBG). The live-firefighting training facilities at NBG and AAFB are dated and plagued with mechanical challenges, and they are located outside of the seven-minute response time to MCB Camp Blaz as required under DoDI 6055.06. This would result in an unacceptable risk to personnel and property at MCB Camp Blaz, in the event of a fire or other emergency during training activities.

2.3.2 Alternative 1 (Preferred Alternative)

Alternative 1 (Preferred Alternative) would involve construction and operation of the FFTF on an approximately eight-acre parcel at the south end of MCB Camp Blaz on the Andreen Softball Field (Figure 2-1). The site is within the MCB Camp Blaz installation boundary, adjacent to the existing MCB Camp Blaz security gate. The existing softball field, associated structures, and the adjacent tennis courts would be demolished and the existing concrete road surface to the softball field would be reconstructed to accommodate the increased weight and traffic of fire and emergency vehicles. New utility lines would be constructed to connect the proposed FFTF to points of connection within MCB Camp Blaz.

The majority of construction activities will take place during normal working hours (6:00 AM to 3:30 PM). Nighttime construction may occasionally be required if the contractor falls behind schedule and needs to recoup time. Nighttime construction may also be required if there is a need to deconflict

munitions of explosive concern (MEC) arcs and nearby operations if any unexploded ordnance (UXO) were to be discovered, which is not expected to be likely. Construction of the Preferred Alternative is expected to begin in 2024 and continue for a period of 24 months.

2.3.2.1 Facilities

The FFTF would consist of the four primary facilities described in Table 2-1. Construction of the proposed facilities would incorporate Leadership in Energy and Environmental Design, commonly referred to as LEED, and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

Table 2-1 Proposed FFTF Training Facilities

Facility	***Description***
EVOC	The EVOC would be an approximately six-acre (2.4 hectare) paved concrete surface that would enable the base fire and rescue vehicle operators to improve and maintain their driving skills in responding to fire and emergency situations. As newer models of fire and emergency vehicles increase in size and weight, vehicle operators must be able to proficiently control the speed and maneuverability of their vehicles for safe and effective operations. The EVOC would be a flat, paved area where cones can be placed and configured for different training exercises. Vehicles used on the EVOC would include four-man engine trucks, four-man ladder trucks, two-man pumper trucks, and other emergency vehicles.
Mockups	The training facility would include 11 firefighter "training mockups." A mockup is a life-size version of a particular scenario that a firefighter may encounter. The mockup allows firefighters to train on a real-world example in a controlled environment. For example, an automobile mockup would contain an automobile that firefighters can use to practice fire extinguishing techniques. The mockups Would be constructed on a concrete paved two-acre area outside of the EVOC. Vehicle circulation would be provided from the training area entry to the area surrounding each mockup. The 11 training mockups to be constructed per NFPA 1402 are: 1 Roof Chop Trainer 2 Vehicle Extraction Area 3 Drafting Pit Area 4 Horizontal Tank Prop* 5 Automobile Prop* 6 Dumpster Prop* 7 Structural Collapse/Search & Rescue Area 8 Hazmat Containment/Decontamination Training Area 9 Portable Fire Extinguisher Prop* 10 Simulated Electrical Powerlines 11 Vertical Fuel Storage Tank Prop* * Live-firefighting simulation

Table 2-1 Proposed FFTF Training Facilities

Facility	*Description*
Training Tower	The six-story training tower would match the height of the tallest BEQs on MCB Camp Blaz. The training tower would have a footprint of approximately 7,200 square feet (689 square meters), and the structure would consist of reinforced and protected (including from extreme heat and fire) concrete with all necessary components such as roof, walls, flooring, foundation, windows, and doors appropriate to Guam seismic, typhoon, and tropical environmental conditions. The tower would be fitted with a range of training related improvements including: rappelling hooks on roof and rappelling safety-nets, a working elevator, a search maze on the ground floor, smoke machines, standpipe connections on each floor and/or in stairwell, enclosed stairwell all the way to the roof from ground floor, exterior ladders mounted on structure accessible from ground floor up to highest level, and training props (including live-firefighting props; one per floor).
Covered Observation/ Control Facility	The covered observation/control facility would be a two-story building with an approximately 2,500 square foot (232m^2) building footprint. It would be an air-conditioned structure consisting of reinforced and protected concrete with all components such as exterior roof, walls, flooring, foundation, windows and doors, stairs enclosures, mechanical, electrical, plumbing, utilities, and information systems appropriate to Guam's seismic, typhoon, and tropical environmental conditions. On the second floor, the observation area will allow instructors and simulation controllers to observe and control all the training equipment and activities in the training area. The facility would have a camera system to monitor the entire training area and control systems to control the propane, audio/video, communications, mechanical, electrical, and related utilities. All the training and non-training related equipment/entities will be managed in this observation area.

Key: EVOC = Emergency Vehicle Operator Course; BEQ = Bachelor Enlisted Quarters; MCB = Marine Corps Base; NFPA = National Fire Protection Agency; m^2 = Square meter

2.3.2.2 Utilities Infrastructure

The Preferred Alternative would include improvements for water, wastewater, propane, electrical, and telecommunications infrastructure. Underground water, wastewater, and electrical utilities would be installed from the project site to the nearest point of connection on Haputo Road, approximately 750 feet (228 meters) north of the proposed site. The Preferred Alternative would include installation of a 2,000 foot-long (610 meters) underground communications line to a point of connection north of the proposed FFTF. Specific utility line locations and points of connection are not shown in Figure 2-1 due to Operational Security (OPSEC) guidelines (Department of the Navy, 2019). Stormwater at the site would be managed according to guidelines in United Facilities Criteria (UFC) 3-210-10 Low Impact Development.

Within the project site, utility distribution would be provided underground to service the facilities. The Preferred Alternative would include the construction of an aboveground propane tank (approximately 10,000 gallons [37,854 liters]). This central propane tank will be piped to five of the eleven training props and the training tower. In addition to the primary connection to the central propane tank, each of the propane-serviced props and tower will each be individually connected to smaller auxiliary propane tanks (up to six) for redundancy during maintenance of the central propane tank. The smaller auxiliary tanks will not exceed 10,000 gallons (37,854 liters) in total additional capacity. The Preferred Alternative would also include the installation of an aboveground water tank (approximately 21,000 gallons [79,494 liters]). The propane tank would be refilled by a mobile refueler and the water tank would be supplied via an on-site utility connection.

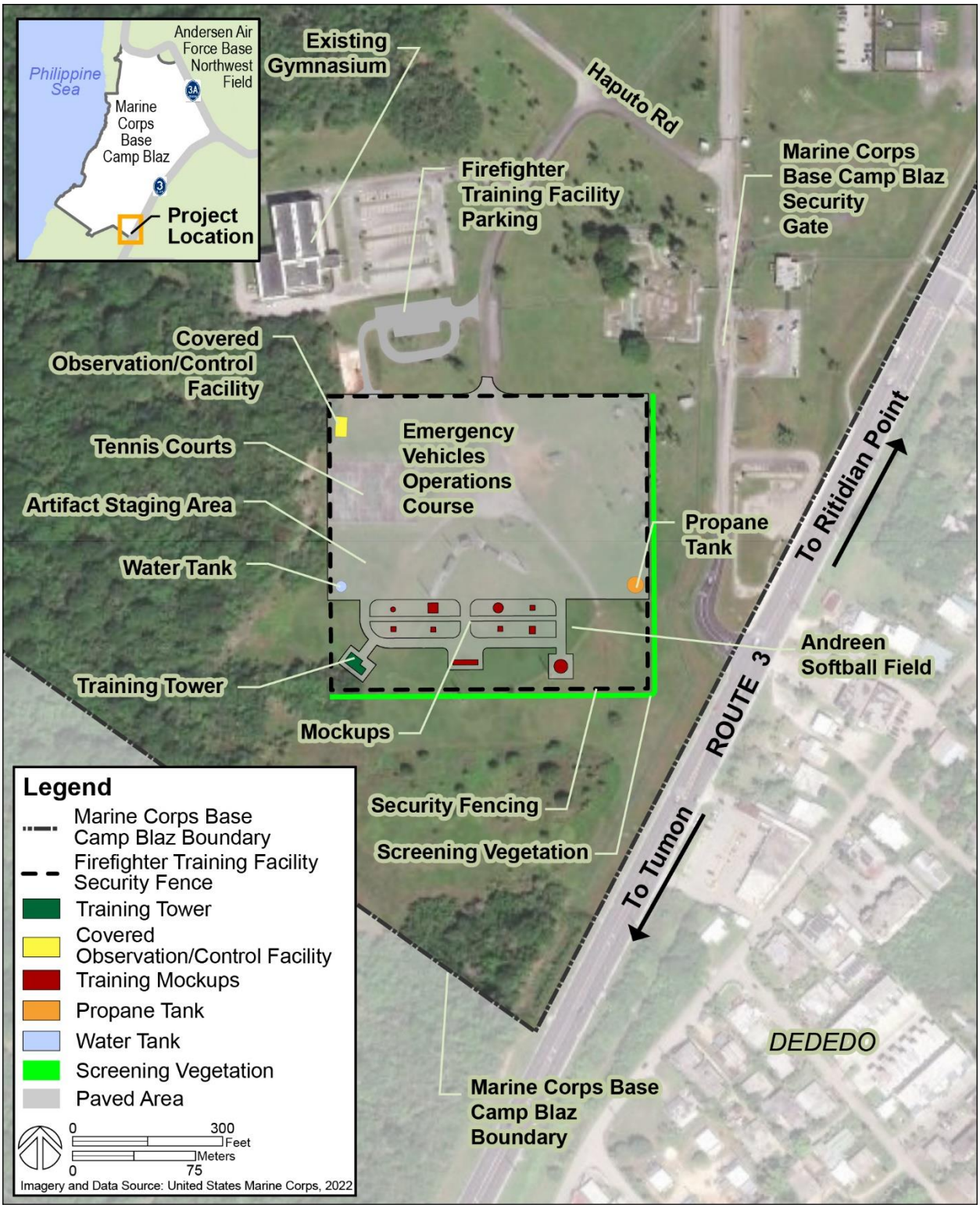


Figure 2-1 Alternative 1 (Preferred Alternative) – Conceptual Site Plan

2.3.2.3 Site Improvements

Site improvements for the Preferred Alternative are described in Table 2-2.

Table 2-2 Site Improvements for Preferred Alternative

Improvement	*Description*
Site Preparation	The FFTF footprint proposed in the Preferred Alternative is within a previously developed area of MCB Camp Blaz. The area would be cleared and graded and the material removed and disposed of prior to construction. Existing facilities occupying the proposed FFTF site would be demolished to accommodate the new facilities. Facilities to be demolished include the softball field, tennis courts, and associated utilities, poles, slabs, fences, and structures. Additionally, cultural artifacts, recovered from disturbed contexts during grubbing and clearing elsewhere around MCB Camp Blaz, are currently located in a temporary artifact staging area (Figure 2-2) within the Preferred Alternative project area. These artifacts will be relocated to a publicly accessible location at the MCB Camp Blaz main gate, and will be installed with informational signage and other necessary interpretive features with language consulted upon with the Guam SHPO per part VIIb.1 of the 2011 Guam PA.
Site Access Roads and Parking	Access to the Preferred Alternative would be provided by the existing Andreen Softball Field access road. Parking would be provided at the existing parking lot located south of the existing gymnasium. The access road and parking lot would be resurfaced to plain cement concrete to support the increased weight and traffic of emergency vehicles accessing the training facility.
Antiterrorism Force Protection and security fencing	The Preferred Alternative would provide ATFP features and comply with ATFP regulations and physical security in accordance with DoD Minimum Antiterrorism Standards for Buildings. Security fencing would be installed along the perimeter of the proposed FFTF site. The fence would be approximately eight feet (2.4 meters) tall. Barbed wire is not required. Building exterior and site lighting would be provided. All lighting would be shielded to reduce light pollution and potential impacts to wildlife.
Vegetation Screening	The Preferred Alternative would include planting of a vegetative screening strip along south and east edges of the proposed FFTF perimeter security fence. The vegetation would consist of at least 50% native species in accordance with the Guam Landscaping Guidelines (Naval Facilities Engineering Systems Command Pacific, 2022).

Key: FFTF = Firefighter Training Facility; MCB = Marine Corps Base; ATFP = Antiterrorism/Force Protection; DoD = Department of Defense; NRHP = National Register of Historic Places; PA = Programmatic Agreement; SHPO = State Historic Preservation Officer

Figure 2-2 Artifact Staging Area

2.3.2.4 Operations

The proposed FFTF would not be occupied on a regular basis and no permanently-based personnel are proposed for this facility. The FFTF is a training ground, primarily for MCB Camp Blaz Fire Department Personnel, and secondarily for mutual aid partners (i.e., Naval Base Guam, Andersen Air Force Base, and Government of Guam Fire Departments). Training events would typically occur monthly, with training occurring on one prop or mockup for each session. A typical training event involves the use of the EVOC and/or training props for an approximately three-hour period (one-hour instruction, one-hour hands-on training, one-hour after-action review). The facility would be open for operations during weekdays between 6:00 AM and 3:30 PM. Occasional weekend training would occur during the same hours. Nighttime training events would occasionally be required. Nighttime training is expected to take place approximately once per quarter and would conclude by approximately 9:00 PM.

During the operational period, firefighters training at the facility would travel to the FFTF in firefighting vehicles from their home stations. Vehicles that may be used during training include:

- Pumper trucks (standard fire trucks)
- Ladder trucks
- Tanker truckers
- Various emergency vehicles

The average training event is estimated to involve 15 personnel and six firefighting vehicles. There would be variations of this typical training event depending on training demands, but this is considered to be a reasonable average case. Once per quarter, larger training events would occur involving up to 28 personnel and ten vehicles. These larger training events would occur with mutual aid partners. Personnel would arrive and depart using their assigned firefighting vehicles.

Some training exercises would utilize live-firefighting scenarios and would generate visible flames at the facility. The majority of training would be conducted with propane, a Class B combustible that is clean burning and leaves virtually no residue. Inside the six-story training tower, some training would be conducted using burning hay or wooden pallets (referred to as Class A combustibles). The Class A combustibles would be untreated (i.e., they would not have been treated with chemicals). The anticipated volume of fuel (hay and wood) per training is approximately 3-5 pallets or 50 pounds (23 kilograms) of hay (i.e., half bail). Annual usage is conservatively anticipated to be 1 ton per year of wood and 1 ton per year of hay. The hay/wood pallet fires would be confined to the interior of the training tower and would not present a hazard of wildfires.

Domestic water would be used by firefighters to simulate real fire suppression methods. Aqueous Film Forming Foam (AFFF) would not be used for firefighting training at the FFTF. Wastewater from all training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system.

The Preferred Alternative would include the installation of a public address system to instruct training participants during their exercises. The public address system would not be used during night training events except in an emergency.

2.3.3 Alternative 2

Alternative 2 would involve construction and operation of the FFTF on an approximately eight-acre parcel at the north end of MCB Camp Blaz (Figure 2-3). The site is within the MCB Camp Blaz installation boundary, adjacent to Potts Junction (i.e., the intersection of Route 3 and Route 3A). The site is currently forested, so this alternative would require land to be cleared and graded, and the material removed and disposed of prior to construction. The project footprint is previously undeveloped and there is the potential for the discovery of cultural and terrestrial biological resources at this site. Discussion of cultural and terrestrial biological resources can be found in sections 3.3 and 3.4, respectively. New communications lines would be constructed to connect the proposed FFTF to a point of connection within MCB Camp Blaz. Construction of the Alternative is expected to begin in 2024 and continue for a period of 24 months.

2.3.3.1 Facilities

The proposed facilities for Alternative 2 would be the same as for the Preferred Alternative (see section 2.3.2.1, Table 2-1).

2.3.3.2 Utilities Infrastructure

Alternative 2 includes utilities improvements for water, wastewater, propane, electrical and telecommunications infrastructure. A 6,560-foot-long (2,000 meter) new communications line would be installed to connect the FFTF to a point of connection west of the proposed FFTF. Water, wastewater, and electrical utilities would be required at this site. Water and wastewater utilities would be extended from a connection point on the main access road. The water connection point is at a distance of 617 feet (188 meters), the wastewater connection point is at a distance of 943 feet (287 meters). Electrical utilities would be extended from the adjacent substation to the west of the project site at a distance of 950 feet (290 meters). Specific utility line locations and points of connection are not shown in Figure 2-3 due to OPSEC guidelines (Navy, 2019). All utility and communications infrastructure would be installed below ground. Stormwater at the site would be managed according to guidelines in UFC 3-210-10 Low Impact Development.

Within the project site, utility distribution would be provided underground to service the facilities, similar to the Preferred Alternative. Alternative 2 would include the construction of an aboveground propane tank (approximately 10,000 gallons [37,854 liters]). This central propane tank would be piped to five of the eleven training props and the training tower. In addition to the primary connection to the central propane tank, each of the propane-serviced props and tower would each be individually connected to smaller auxiliary propane tanks (up to six) for redundancy during maintenance of the central propane tank. The smaller auxiliary tanks would not exceed 10,000 gallons (37,854 liters) in total additional capacity. Alternative 2 would also include the installation of an aboveground water tank (approximately 21,000 gallons [79,494 liters]). The propane tank would be refilled by a mobile refueler and the water tank would be supplied via an on-site utility connection.

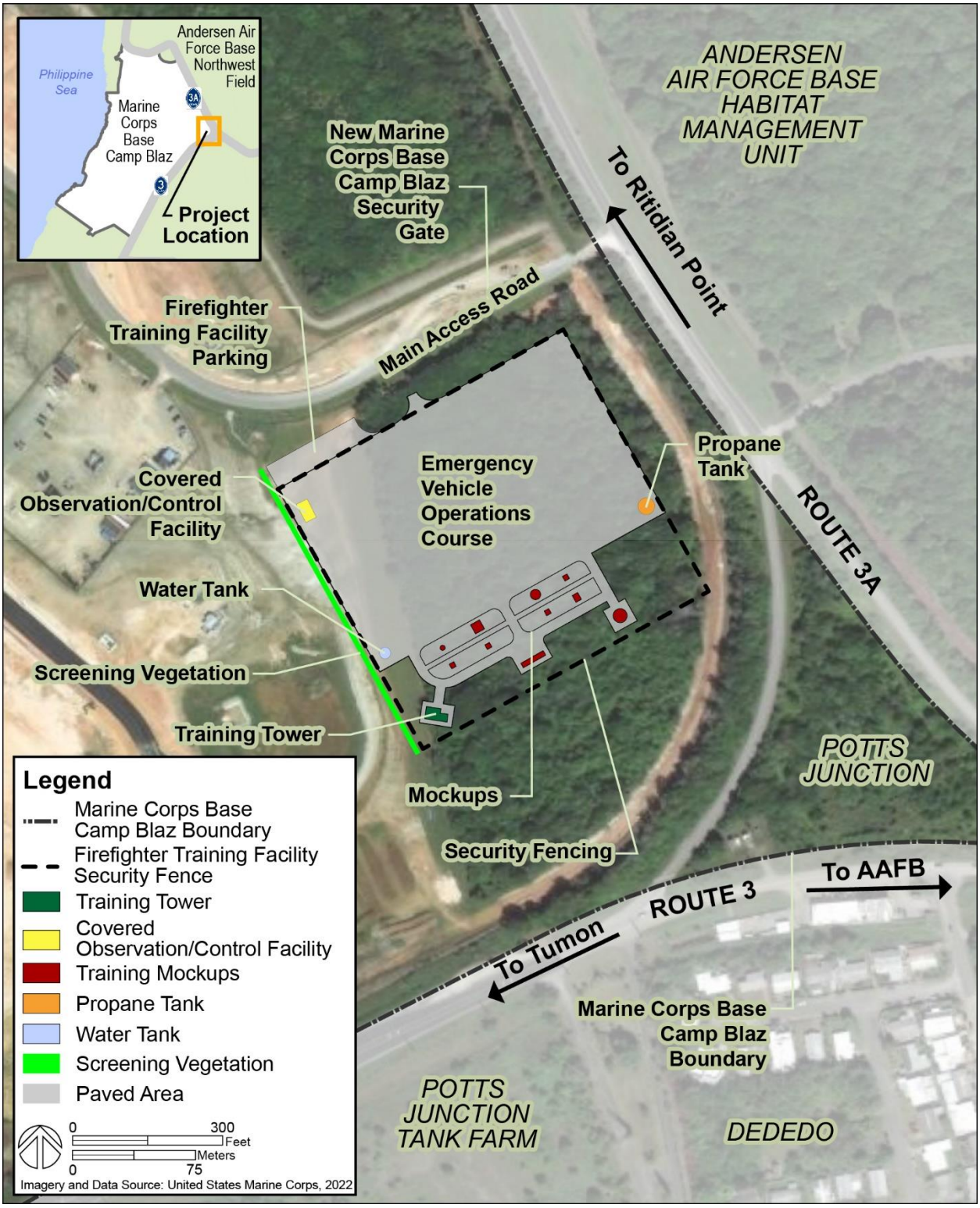


Figure 2-3 Alternative 2 – Conceptual Site Plan

2.3.3.3 Site Improvements

Site improvements for Alternative 2 are included in the table below (Table 2-3).

Table 2-3 Site Improvements for Alternative 2

Improvement	*Description*
Site Preparation	The FFTF footprint proposed in Alternative 2 is located within an existing forested area. Construction of the proposed FFTF would require the clearing of existing vegetation. The project footprint would be cleared and graded, and the material removed and disposed of prior to construction of the proposed FFTF.
Site Access Roads and Parking	Access to the Alternative 2 site would be provided by the roadway currently under construction along the northern boundary of this site. Parking would be provided in an asphalt lot adjacent to the road in the northwestern corner of the site. The parking requirement proposed parking area (945 square yards (790 m^2)) would be additional to the eight-acre footprint of the FFTF.
Anti-Terrorism Force Protection and Security Fencing	Alternative 2 would provide ATFP features and comply with ATFP regulations and physical security in accordance with DoD Minimum Anti-Terrorism Standards for Buildings. Security fencing would be installed along the perimeter of the proposed FFTF site. The fence would be approximately eight feet (2.4 meters) tall. Barbed wire is not required.
Screening Vegetation	Alternative 2 would include planting of a screening vegetation strip along the southwest edge of the proposed FFTF perimeter security fence. The vegetation would consist of at least 50% native species in accordance with the Guam Landscaping Guidelines (Naval Facilities Engineering Systems Command Pacific, 2022).

Key: FFTF = Firefighter Training Facility; MCB = Marine Corps Base; m^2 = square meters; ATFP = Anti-Terrorism/Force Protection; DoD = Department of Defense

2.3.3.4 Operations

Under this alternative, the operation of the proposed FFTF would be the same as for the Preferred Alternative (see Section 2.3.2.4).

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

Several alternative locations were considered but not carried forward based on the screening factors described in Section 2.2 (see Table 2-4 and Figure 2-4).

Table 2-4 Alternatives Considered But Not Carried Forward For Detailed Analysis

Alternative Name	*Location*	*Reason for Dismissal*
Alternative 3: New FFTF at MCB Camp Blaz	Within MCB Camp Blaz, approximately 2,000 feet (610 meters) west of the BEQs.	Location conflicts with preexisting operational constraints
Alternative 4: New FFTF at MCB Camp Blaz	Within MCB Camp Blaz approximately 3,000 feet (915 meters) southwest of the BEQs.	Located within two wellhead protection zones; known sinkholes in the area
Alternative 5: New FFTF at MCB Camp Blaz	Within MCB Camp Blaz approximately 4,000 feet (1,912 meters) south of the BEQs	Located within two wellhead protection zones; known sinkholes in the area

Key: FFTF = Firefighter Training Facility; EA = Environmental Assessment; MCB = Marine Corps Base

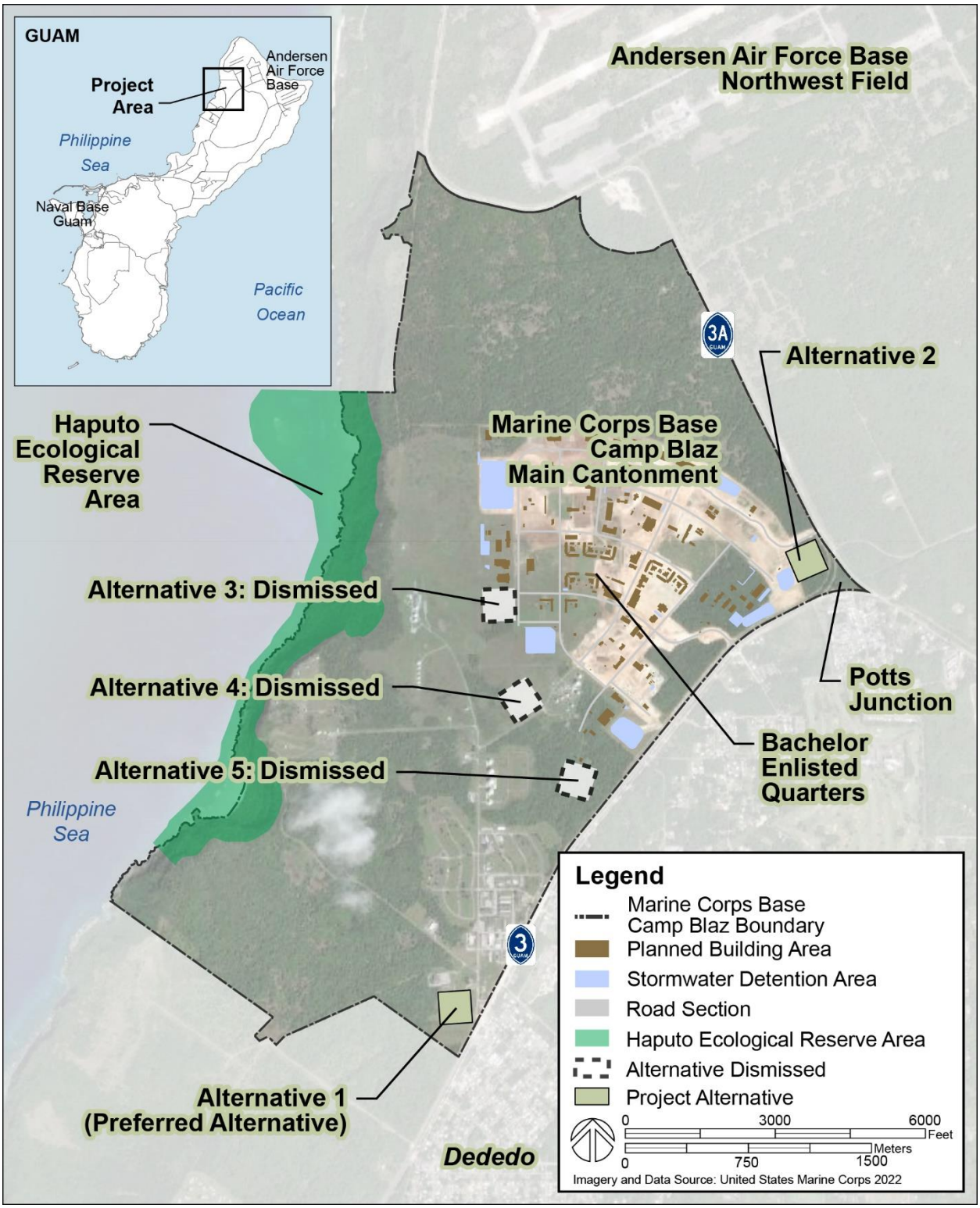


Figure 2-4 Location of Alternatives not Carried Forward for Detailed Analysis

2.5 Best Management Practices Included in Proposed Action

This section presents an overview of the BMPs that are incorporated into the Proposed Action. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-5 includes a list of BMPs. Mitigation measures are discussed separately in Chapter 4.

Table 2-5 Best Management Practices

BMP	***Description***
Plant screening vegetation	To minimize impacts to visual resources, the Navy would plant screening vegetation along the FFTF perimeter fence facing Route 3.
Management of Cultural Resources	To protect cultural resources, the Navy would comply with the PA among the Commander, Navy Region Marianas; Advisory Council on Historic Preservation; and the Guam Historic Preservation Office. In the event there are inadvertent discoveries of historic properties during any ground-disturbing activity, the SOPs listed in the Programmatic Agreement among the Commander, Navy Region Marianas; Advisory Council on Historic Preservation; and the Guam Historic Preservation Office regarding Navy Undertakings on the Island of Guam (Navy et al. 2011) would be implemented. Inadvertent discoveries of historic properties would be documented per the NHPA and associated regulations 36 CFR 800.
Pre-construction nest surveys of MBTA-protected bird species	To prevent adverse impacts to protected avian species nest surveys for protected bird species would be conducted before construction. Active nests would be left in place and undisturbed until chicks have fledged. A biologist would monitor active nests during construction activities to reduce the chances of nest abandonment by temporarily shutting down construction activities that disrupt the normal daily patterns of the birds.

Table 2-5 Best Management Practices

BMP	*Description*
BMPs for Mariana fruit bat	To avoid or minimize impacts to Mariana fruit bats, the following would be conducted: 1. The Navy would ensure that all construction activities would occur within the limits of construction to prevent additional habitat loss. Limits of construction must be shown on contract plans and specifications and physically demarcated in the field prior to any vegetation clearing. This measure is intended to prevent additional habitat loss. The measure would be implemented during pre-construction and construction. 2. Pre-construction surveys for Mariana fruit bats would be conducted by a qualified biologist the day before and the day of vegetation clearing of Mariana fruit bat habitat. a. Qualified biologist is defined as a person who has successfully completed a full four-year course of study in an accredited college or university leading to a bachelor's or higher degree, which includes a major field (24 semester hours) of study in biological sciences, wildlife biology, botany, natural resource management, environmental sciences, or related disciplines appropriate to this position or an appropriate combination in education and experience AND a minimum of 100 documented hours conducting Mariana fruit bat surveys or monitoring of closely related species. 3. Construction contractors would be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint at the start of each day where noise generating equipment would be used. If Mariana fruit bats are observed prior to the start of work in the project footprint, work would be postponed until the Mariana fruit bat has left the area of its own volition. If bats enter the project footprint after the start of construction, work would continue. 4. Operators of the FFTF would be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint prior to use of the facility. If Mariana fruit bats are observed prior to the start of training, work would be postponed until the Mariana fruit bat has left the area of its own volition. If bats enter the project footprint after the start of training, work would continue. 5. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the use of shielded outdoor lights to protect Mariana fruit bats. 6. The Navy would specify housekeeping and vehicle cleanliness measures in contractor environmental plans to reduce the likelihood of spread of invasive species within the construction area. To the extent practicable and to be performed in conjunction with stormwater pollution prevention practices, cargo and vehicles would be inspected upon entry to the construction site and high-pressure wash-down would be performed to reduce organic material and mud from leaving or entering the jobsite. Dirty vehicles, equipment or cargo would be cleaned of dirt, debris, organisms, weeds and other material before they enter the jobsite and discarded material would be tested, packaged or treated before disposal. Green waste would be reused on-base to the greatest extent practicable and would be managed to reduce Coconut Rhinoceros Beetle and Little Fire Ant spread or breeding.

Table 2-5 Best Management Practices

BMP	*Description*
Shielded lighting	The Navy would use shielded outdoor lights to prevent disorientation, disturbance, and/or injury to light-sensitive wildlife, including Mariana fruit bats and MBTA-species. Shielded outdoor lighting would also reduce impact from light pollution to the public ROW along Route 3.
Management of noise emissions during construction	Construction noise would be reduced by ensuring correctly functioning muffler systems are installed on equipment utilizing internal combustion engines. Compressors, whether electric or fuel powered, would be used with appropriate containment or baffles to help abate noise levels.
Erosion control	To prevent or minimize water quality impacts, the Navy would comply with NPDES provisions. These provisions include SWPPP; erosion and sediment control measures, such as protection of erodible soils; control of storm water runoff from the construction site; use of sediment basins; use of vegetation and mulch on soil exposed by grading; use of silt fencing and barriers around excavated and cleared areas; and fugitive dust control measures.
Low impact development	To prevent or minimize water quality impacts, wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release. For example, an equalization tank system would be used to collect, treat, and pump the wastewater to the sanitary sewer system.
Spill Prevention Control	To prevent or minimize water quality impacts, equip all vehicles with on-board spill containment kits, park on paved surfaces where possible, and place drip pans beneath parked vehicles. In the event of an accidental release of fuel, implement the Guam Environmental Protection Agency *Spill Prevention Control Countermeasure Program.*
Construction dust control	To prevent or minimize impacts from air pollution such as fugitive dust. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Other potential BMPs include paving and landscaping of project areas early in the construction schedule and moving construction equipment and workers to and from the project site during off-peak traffic hours.
Hazardous Waste Management	Hazardous materials or wastes encountered during construction would be handled, transported, disposed of and/or remediated in accordance with applicable federal and territorial regulations.
Standard operating procedures	To ensure safety and avoid environmental impacts from the operations of the facility, the MCB Camp Blaz Fire Department will establish standard operating procedures for the proposed FFTF.

Key: MBTA = Migratory Bird Treaty Act; NPDES = National Pollutant Discharge Elimination System; NHPA = National Historic Preservation Act; PA = Programmatic Agreement; ROW = Right of Way; SOP = Standard Operating Procedure; SWPPP = Storm Water Pollution Prevention Plan

3 Affected Environment and Environmental Consequences

3.1 Approach to Analysis

This chapter summarizes the approach to defining the affected environment and effects analysis for resources evaluated in this Environmental Assessment (EA). Detailed analysis by resource subject and resource-specific methodology is provided in Section 3.2 through Section 3.10.

3.1.1 Describing the Affected Environment

The affected environment includes areas where impacts from the Proposed Action or alternatives evaluated in the EA could occur, as depicted graphically by the region of influence (ROI). The affected environment is considered the baseline environment as it stands currently without the Proposed Action. Historical actions and predictable environmental trends have contributed to the current environment. Under the no-action and action alternatives, environmental trends and reasonably foreseeable future actions (RFFAs) are assumed to proceed (where there is no evidence to the contrary). The analysis takes these factors into account to determine the potential for additive effects or conflicting uses of the human environment.

3.1.2 Predictable Environmental Trends

Predictable environmental trends in this EA are trends generally agreed upon by the greater scientific community and/or those that could result from RFFAs. A future action is considered an RFFA for this EA if it is (1) included in a federal, state, or local planning document; (2) likely to occur based on the recommendations of federal, state, or local planning agencies; (3) an existing permit application; or (4) a fiscal appropriation that is likely (or reasonably certain) to occur. For purposes of this analysis, RFFAs were considered if they could result in potential impacts that could have temporal or geographic overlap with potential effects of the Proposed Action and alternatives.

3.1.2.1 Climate Change

Climate change is an environmental trend with wide ranging implications for the assessment of potential future environmental impacts. The existing climate conditions in the project area provide a baseline for the analysis of potential changes to the various resource areas associated with climate change. The existing climate conditions in Guam are representative of the existing climate conditions of the project area as summarized in Table 3-1.

Table 3-1 Existing Climate Conditions of Guam

Climate Condition	*Description*
Regional Temperature	Average annual air temperature is 83°F (28°C). Temperature ranges remain between 77°F (25°C) and 88°F (31°C) throughout the year.
Precipitation pattern	Rainfall averages between 84-116 inches (213-295 centimeters) per year. Rainy season is between the months of June through December. The dry season (January through May) can have 75 percent less rain than the rainy season.
Frequency and intensity of extreme weather events	The typhoon belt extends through the region. An average of three tropical storms and one typhoon pass within 180 nautical miles (333 kilometers) of Guam each year.
Elevation	The elevation of MCB Camp Blaz is roughly 410 feet (125 meters) above sea level.

Table 3-1 Existing Climate Conditions of Guam

Climate Condition	*Description*
Sea Surface Temperatures	Average sea surface temperature is 83.5°F (28.6°C). Sea surface temperatures range from the warmest temperature in August of 85.3°F (29.6°C) to the coldest temperature in February of 82°F (27.8°C)

Key: MCB = Marine Corps Base; °F = degrees Fahrenheit; °C = degrees Celsius;
Source: Keener et al. 2015; World Sea Temperature, 2022.

Climate change is a global issue and trend occurring as a result of collective emissions of greenhouse gases (GHGs) with regional consequences. The latest science on climate change is summarized by numerous agencies, with the most prominent being the Intergovernmental Panel on Climate Change (IPCC). The Sixth Assessment Report is the most recent IPCC report, released in 2021. The Pacific Islands Regional Climate Assessment (PIRCA) released a report focused on Climate Change in Guam in 2020 (Grecni et al.).

Climate change is likely to negatively impact Guam. Potential long-term negative environmental impacts include sea level rise, increases in ocean temperature, increasing severity of storms and droughts due to changing weather patterns, increased hot days and lower overall rainfall, and changes to local ecosystems that could include the loss of species. Predictable environmental trends associated with climate change for each resource are based on the PIRCA report (Grecni et al., 2020.). The PIRCA report provides various scenarios–future high, future low—and predictions for frequency of rainfall events and sea level rise (see Table 3-2). The predictable environmental trends associated with climate change identified in Table 3-2 were evaluated to determine their potential future effects on each resource evaluated in this EA, as well as the potential for additive impacts from the Proposed Action.

Table 3-2 Predictable Environmental Trends Associated with Climate Change Projected for Late Century

Predictable Trend	*Description*
Rising global temperatures (air/ocean)	Air temperatures have been increasing in Guam. Average air temperature is predicted to rise by between 2.7-6.3°F (1.5-3.5°C) by 2100 (RCP 8.5). In the 1950s, 5 days per year exceeded 88°F (31°C). By the 1990s, this had increased to 36 days per year, and by 2100 Guam is projected to have 257 days over 90°F (32°C).
Change in precipitation patterns	Under the future high scenario presented in the PIRCA report average annual rainfall is projected to decrease 7% by 2100. Under this model the rainy season is predicted to see a 12% reduction while the dry season will see a 9% increase in rainfall. Decreased rainfall is expected to reduce rainfall recharge rates to the NGLA which will lead to increased groundwater salinity.
Increased frequency and/or intensity of extreme weather events	The Marianas region is expected to experience more frequent and intense extreme rainfall events. Drought conditions are projected to occur in four out of ten years on average by 2100. The number of typhoons that affect Guam is expected to decrease, however, tropical cyclone intensity is likely to increase. This will lead to stronger storms. Future typhoons are likely to happen less often but be more severe and have greater impact.

Table 3-2 Predictable Environmental Trends Associated with Climate Change Projected for Late Century

Predictable Trend	*Description*
Rising Sea Level and Associated Storm Surge	The sea level around Guam is rising at an average rate of 0.13 inches (3.4 millimeters) per year. Global MSL is projected to rise between 1 and 4.3 feet (0.3-1.3 meters) by 2100. Sea level rise in Guam is expected to be higher than the global average. A scenario of 3 feet (0.9 meters) of sea level rise will expose 58% of Gaum's infrastructure to impacts, predominantly in the South. Sea level rise is not expected to increase groundwater salinity in the NGLA (USGS, 2019). Note that sea level rise and storm surge are not expected to impact either project alternative due to the sites being over 300 feet (91 meter) above MSL and approximately 1 mile (1.6 kilometers) inland from the coast.
Ocean Acidification	Ocean acidification has been slowly increasing since 1988 due to additional carbon dioxide in the atmosphere reacting with sea water. This increases the acidity of the ocean. Under projected warming, coral reefs in Guam will experience annual bleaching beginning in 2035. Note that ocean acidification is not expected to impact this project due to the sites being over 300 feet (91 meters) above MSL and approximately 1 mile (1.6 kilometers) inland from the coast.

Key: °C = degrees Celsius; °F = degrees Fahrenheit; MSL = mean sea level; NGLA = Northern Guam Lens Aquifer; PIRCA = Pacific Islands Regional Climate Assessment; RCP = representative concentration pathway;
Sources: Grecni et al., 2020; USGS, 2019.

3.1.2.2 Reasonably Foreseeable Future Actions

The RFFAs considered as part of the predictable environmental trends are summarized in Table 3-3 and depicted in Figure 3-1.

Table 3-3 Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Actions	*Project Description*	*Time Frame*
Infrastructure Upgrades Andersen Air Force Base (AAFB), Guam	The United States (U.S.) Air Force proposes to construct infrastructure upgrades at AAFB and to use this infrastructure consistent with existing installation operations once construction is completed. Infrastructure upgrades would occur adjacent to the existing airfield operations area and in the Munitions Storage Area-1, totaling approximately 204 acres (83 hectares). Infrastructure upgrades adjacent to the existing airfield operations area would occur in a location that is referred to as the "North Ramp."	Environmental Impact Statement underway. Construction anticipated to take seven years starting in 2024.

Table 3-3 Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Actions	*Project Description*	*Time Frame*
Air National Guard (ANG) Beddown for the Fifth Space Control Squadron (SPCS #5) Basing Actions AAFB, Guam	The U.S. Air Force proposes to construct and operate facilities for the beddown of a defensive ANG SPCS mission (SPCS #5) at AAFB, Guam. The proposed SPCS #5 beddown would encompass an area approximately five acres (two hectares) in size and would be located near the Base Exchange. The proposed improvements would include the construction of a new administration building, maintenance area, hazardous storage area, equipment pad, parking lot, and air conditioner unit. The SPCS #5 would require the addition of between 62 and 105 ANG personnel in support of a defensive mission.	Initial operational capability by 2023 and full operational capability by 2024
198 megawatt (MW) Ukudu Power Plant Dededo, Guam	GPA is constructing the new 198 MW Ukudu Power Plant in Dededo, approximately three miles (five kilometers) south of MCB Camp Blaz. The new power plant would replace existing power plants in Cabras and would burn ULSD and natural gas. The new power plant would increase power reliability on Guam and would integrate existing and future sources of renewable energy into the island-wide power system.	Construction to be completed in 2024
Defense of Guam Enhanced Integrated Air and Missile Defense (EIAMD) Multiple sites on Guam	The EIAMD will involve the deployment and operation of a combination of components from the Missile Defense Agency (MDA), Department of the Army, and Department of the Navy that would be integrated for air and missile defense. These proposed components include missile defense radars and sensors, missile interceptor launchers, and command and control systems. The MDA anticipates airspace modification may be necessary at sites where radars would be located. The MDA and Army need to strategically locate and integrate the system components at multiple sites around Guam. The MDA has not released specific locations so this project is not included in Figure 3-1.	Operational capability by 2027
Construction of Facilities and Associated Infrastructure at the Guam National Wildlife Refuge (GNWR), Ritidian Unit Yigo, Guam	The U.S. Marine Corps proposes to construct replacement facilities and associated infrastructure for the U.S. Department of the Interior (DOI) (including the U.S. Fish and Wildlife Service and U.S. Geological Survey) at the Ritidian Unit of the GWNR. The proposed action also includes road improvements and development of an alternate public access route to the new DOI facilities and recreation areas within the GWNR, demolition of the existing DOI facilities, and preparation of the demolition site for restoration and regeneration.	Construction to be completed by 2028

Key: AAFB = Andersen Air Force Base; ANG = Air National Guard; DOI = Department of the Interior; EIAMD = Enhanced Integrated Air and Missile Defense; FONSI = Finding of No Significant Impact; GPA = Guam Power Authority; GWNR = Guam National Wildlife Refuge; MDA = Missile Defense Agency; MW = megawatt; SPCS = Space Control Squadron; ULSD = Ultra Low Sulfur Diesel.

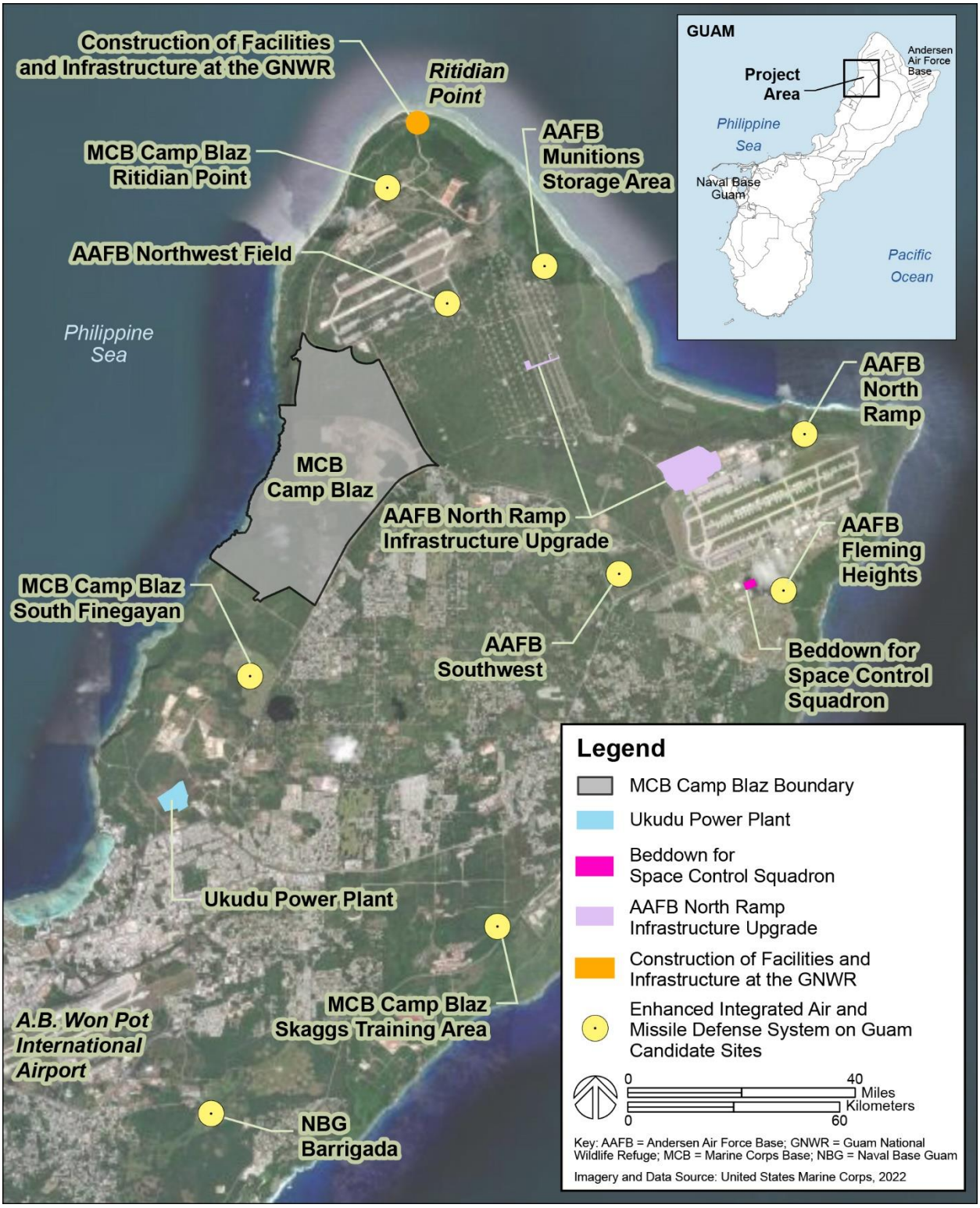


Figure 3-1 Location of Reasonably Foreseeable Future Actions

3.1.3 Description of Effects Analysis

"Significantly," as used in the National Environmental Protection Act (NEPA), requires considerations of both context and intensity (See 40 Code of Federal Regulations [CFR] 1508.27 for complete definition). Context means that the significance of an action must be analyzed under several perspectives such as society as a whole, the affected region, the affected interests, and the locality. Significance varies with the setting of a Proposed Action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would need to be in order to be significant.

3.1.4 Resources Evaluated in Detail

This EA analyzes the following resources in detail: visual resources, cultural resources, terrestrial biological resources, noise, water resources, air quality and greenhouse gases, hazardous materials and hazardous wastes, public health and safety, and environmental justice.

Impacts to the following resource areas were negligible or nonexistent, therefore, they were not analyzed in detail:

Airspace: Construction and operation of the Proposed Action would not involve impacts to military or civilian airspace.

Geological Resources: The Proposed Action would not involve work that will affect major geological characteristics such as topography (i.e., sink holes with significant aquifer recharge features), bedrock material, or mineral deposits. Ground-altering construction activities would comply with all applicable regulations, and the Contractor would be responsible for implementing Best Management Practices (BMPs) to control soil erosion and sedimentation during construction activities (See BMP Table 2-5). There are no significant aquifer recharge features in the project area.

Infrastructure: The Proposed Action would not require any infrastructure improvements outside of the installation. The operations of the proposed facility would have a negligible effect on the overall demand for utility service at MCB Camp Blaz.

Land Use: The Proposed Action would be located entirely within MCB Camp Blaz and would have no impact on off-base development. The entire territory of Guam lies within the Coastal Zone as defined by the Coastal Zone Management Act (CZMA). The Navy is coordinating with the Guam Bureau of Statistics and Plans to ensure the Proposed Action is consistent with the Guam Coastal Management Program to the maximum extent practicable and complies with the CZMA. Appendix C includes the coastal consistency analysis for the Proposed Action.

Socioeconomics: The Proposed Action would not contribute to changes in socioeconomic conditions on the island of Guam. There would be no change in the number of personnel assigned to MCB Camp Blaz, and, therefore, there would be no changes in area population or associated demands for housing and support services.

Transportation: Construction activities associated with the Proposed Action would generate temporary increases in traffic to the immediate project vicinity. However, these temporary increases would be minimal and would not exceed roadway capacities. During the operational period, MCB Camp Blaz firefighters training at the facility would travel to the FFTF in their firefighting apparatus (i.e., pumper truck, ladder truck, tanker truck etc.) from the fire station within MCB Camp Blaz. During mutual aid trainings (approximately four times per year), firefighters from mutual aid fire departments across Guam would travel to train at the FFTF. They would generally travel to the site in their firefighting apparatus from their home stations and there would be a negligible impact on traffic.

3.2 Visual Resources

This section describes potential impacts to visual resources that could result from implementation of the Proposed Action.

3.2.1 Regulatory Setting

The North and Central Guam Land Use Plan established a land use vision for the area and identifies goals and policies to achieve that vision (Guam Bureau of Statistics and Plans [GBSP], 2009). In the plan, Natural Systems, Policy Seven states, "identify and preserve existing scenic views from public places, such as parks, highways and shoreline areas." The project sites for the Preferred Alternative and Alternative 2 are not within scenic view planes.

3.2.2 Affected Environment

Views are described in terms of foreground (visual elements nearest to the viewer), background (visual elements furthest from the viewer), and middle-ground (visual elements between the foreground and background). Visual resources are further defined by the following:

- Dominant landscape features
- Diversity
- Elements of line, color, form, and texture
- Historic and cultural importance
- Overall landscape character

3.2.2.1 Existing Conditions

The ROI for visual resources consists of areas where physical changes would occur and the locations from which they are visible. For this project, this is defined as MCB Camp Blaz and the adjacent areas from which the Proposed Action would be visible, including public views into MCB Camp Blaz from Route 3. The area is relatively flat with no prominent topographic features such as hills or valleys.

The Alternative 1 project site is located in the southeast corner of MCB Camp Blaz, 100 feet (30 meters) from Route 3 (Figure 3-2). The site elevation is 370 feet (113 meters) above Mean Sea Level (MSL). The site is 1 mile (1.6 kilometers) inland of the coastline. The landscape surrounding the Alternative 1 project site is predominantly cleared and previously developed as part of the former Naval Computer and Telecommunications Station (NCTS). When viewed from outside of the MCB Camp Blaz installation boundary, the site is behind installation fencing and close to a security gate that provides access to MCB Camp Blaz (formerly the NCTS gate). The proposed site is located on the existing Andreen Softball Field and the adjacent tennis courts. The field has a perimeter fence, backstop, dugouts, lighting, and an

announcer's booth. Viewed from Route 3, the tennis courts are behind the softball field, and consist of a perimeter fence, playing surface, and lighting. Beyond the site is an existing limestone forest.

The Alternative 2 project site is located in an existing forested area in the northeast corner of MCB Camp Blaz 450 feet (135 meters) from the intersection between Route 3 and Route 3A, known as Potts Junction (Figure 3-3). The site elevation is 470 feet (143 meters) above MSL. The site is 1 mile (1.6 kilometers) inland of the coastline. The site would require clearing and grading, and the material to be removed and disposed of prior to construction. The site is surrounded by installation security fencing topped by barbed wire. Power lines run alongside the installation fence. Adjacent to the west edge of the site is land area already cleared for the construction of the MCB Camp Blaz. The cleared area extends 2,000 feet (610 meters) to the east from the Alternative 2 project site along the Route 3 frontage. Public views from Route 3 along this cleared frontage are defined by the ongoing construction of the MCB Camp Blaz, including the six-story BEQs located approximately 0.5 miles (0.8 kilometers) west of the Alternative 2 project site.

3.2.2.1.1 Key Observation Points

Key Observation Points (KOPs) were identified to represent viewing locations of the potentially affected landscape. KOPs are accessible to the general public. Views experienced from the KOPs provide a representation of characteristic landscape and the visual quality that could be affected by the Proposed Action.

One KOP is associated with each alternative. Given the flat topography and surrounding land use, the KOPs for both alternatives will be from locations along Route 3 (Figures 3-2 and 3-3). The visual impact analysis focuses primarily on public views of the Proposed Action sites. Table 3-4 describes the views toward the alternative project areas from the KOPs along Route 3.

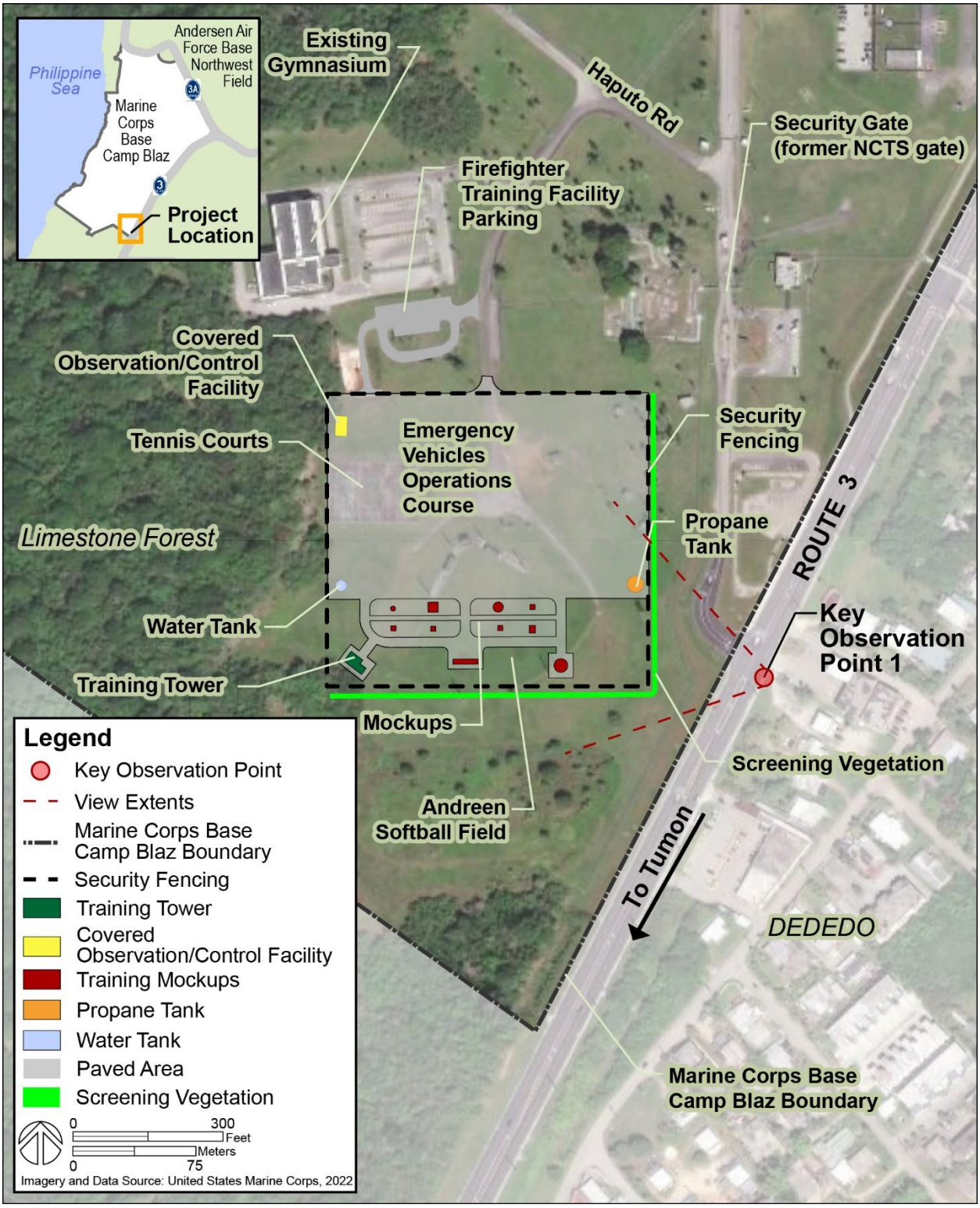


Figure 3-2 Location of Key Observation Point 1 (Preferred Alternative)

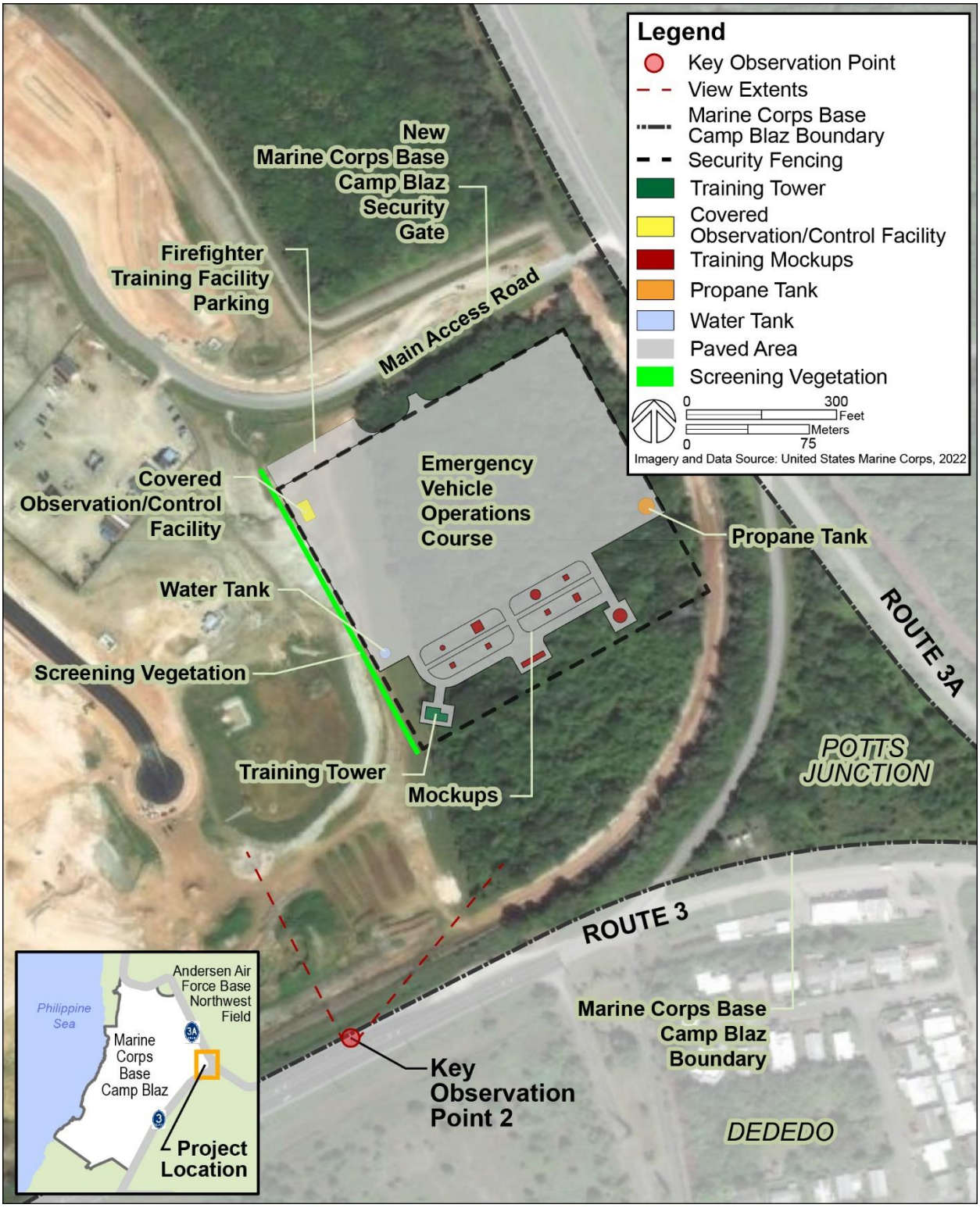
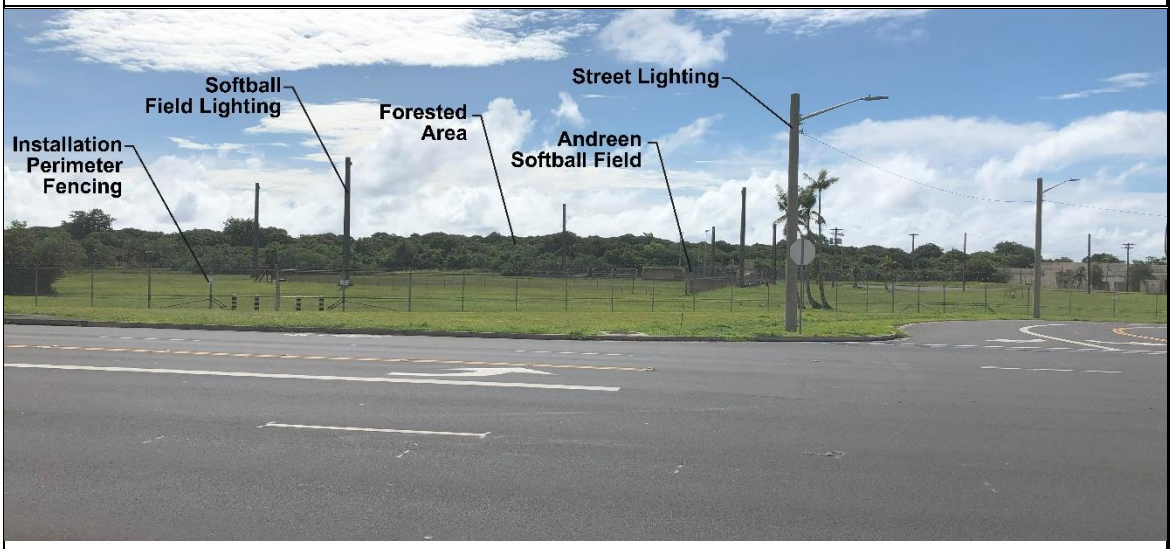
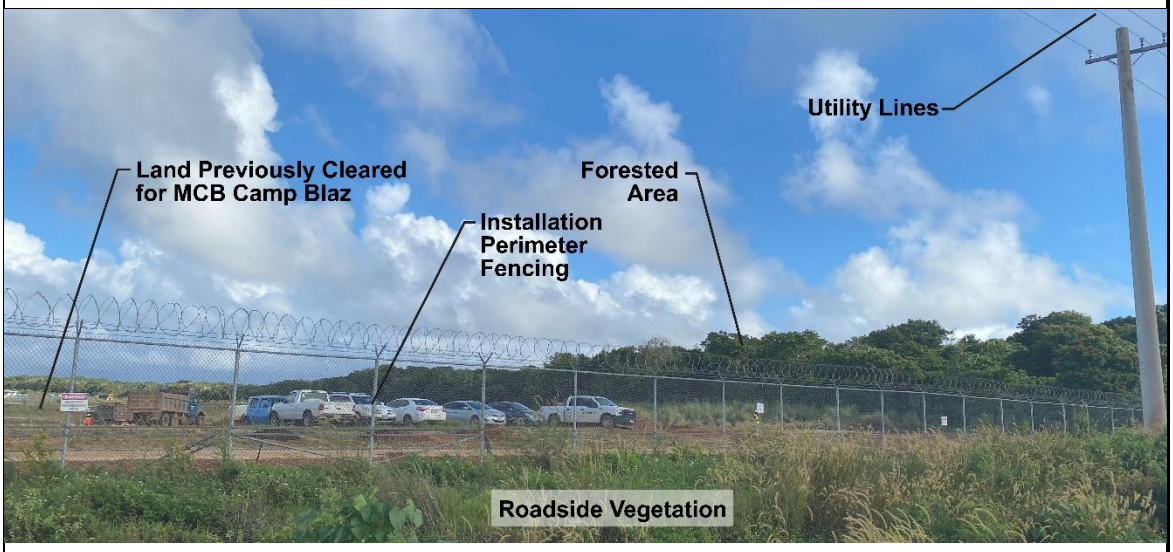


Figure 3-3 Location of Key Observation Point 2 (Alternative 2)

Table 3-4 Views Toward the Project Areas from Key Observation Points

KOP	*Description of existing views toward the project areas from Route 3*
1	The view is characterized by installation perimeter fencing and street lighting in the foreground adjacent to Route 3. Behind the fencing, the middle-ground is characterized by the existing Andreen Softball Field, and the associated lighting. The forested area is in the background. A key map indicating the KOP viewshed is provided in Figure 3-2. 
2	The view is characterized by roadside vegetation, installation perimeter fencing, and utility lines in the foreground. The middle-ground includes the areas previously cleared for the MCB Camp Blaz. The existing forested area (where Alternative 2 would be located) serves as the background. A key map indicating the KOP viewshed is provided in Figure 3-3. 

3.2.2.2 Predictable Environmental Trends

3.2.2.2.1 Predictable Trends Associated with Climate Change

Table 3-5 summarizes the predictable environmental trends for visual resources associated with climate change.

Table 3-5 Predictable Environmental Trends for Visual Resources Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	Not applicable. No reasonably close causal relationships to visual resources identified.
Change in precipitation patterns	Not applicable. No reasonably close causal relationships to visual resources identified.
Increased frequency and/or intensity of extreme weather events	Increased frequency and/or intensity of extreme weather events could cause damage and destruction to the facility and natural vegetation that contribute to the existing project area.
Rising Sea Level and Associated Storm Surge	Not applicable. No reasonably close causal relationships to visual resources identified.
Ocean Acidification	Not applicable. No reasonably close causal relationships to visual resources identified.

3.2.2.2.2 Predictable Trends Associated with RFFAs

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on visual resources because none of the RFFAs will be visible from either KOP.

3.2.3 Environmental Consequences

The evaluation of visual resources in the context of environmental analysis typically addresses the contrast between visible landscape elements. Collectively, these elements comprise the aesthetic environment, or landscape character. The landscape character is compared to the Proposed Action's visual qualities to determine the compatibility or contrast resulting from the buildout and demolition activities associated with the Proposed Action.

3.2.3.1 Nature and Type of Impacts

Construction activities such as vegetation clearing and operation of equipment and machinery can draw the eye of sensitive viewers and contrast with the existing landscape. Likewise, a newly built structure may introduce visual contrast due to changes in form, line, color, or texture against the existing landscape. Both construction and operations can introduce nighttime lighting to the landscape, increasing nighttime visibility in the area as well as potential glare.

3.2.3.2 Impact Assessment Methodology

The North and Central Guam Land Use Plan includes a policy to "identify and preserve existing scenic views from public places, such as parks, highways and shoreline areas (GBSP, 2009)." The sites for the Preferred Alternative and Alternative 2 are not within scenic views. Therefore, the visual impact analysis primarily focuses on public views of the Proposed Action sites which are gained from Route 3.

Short-term project activities such as project construction are considered to have no impacts or minor impacts to visual resources because the construction work would only be temporary and will not become a constant feature of the site. The analysis considers the affected area and degree of effects from the Proposed Action. The level of impact was assessed for the permanent facility for each alternative. The level of impact was determined by assessing the level of contrast between the Proposed Action and the surrounding landscape, and the degree to which those visual changes would degrade the existing character of the landscape.

3.2.3.3 No Action Alternative Impact Assessment

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

3.2.3.4 Alternative 1 (Preferred Alternative) Impact Assessment

A photosimulation of the completed Preferred Alternative from KOP 1 is provided in Figure 3-4.

Figure 3-4 Photosimulation of the Preferred Alternative from Key Observation Point 1

3.2.3.4.1 Construction-related impacts

The increased presence of construction materials and equipment, and/or increased level of construction-related activities would cause moderate visual contrast and impacts during construction and laydown. The site is previously developed and vegetation clearing would be minimal. Structures including the announcer's booth and fencing for the Andreen Softball Field would be demolished. Construction activities would occur in the middle-ground as viewed from Route 3.

3.2.3.4.2 Operations-related impacts

The project will include vegetative screening along the FFTF security fence facing Route 3. Therefore, most of the low-lying visual elements of the FFTF will be screened from view. The main vertical elements (the six-story training tower, and to a lesser extent the two-story observation/control facility and security fence line) would be noticeable to pedestrians, motorists, and residents along Route 3, as indicated in Figure 3-4. These elements would result in moderate visual contrast and impacts. The six-

story training tower would be similar in scale to the elevated NCTS water tanks along Route 3, and the two-story observation/control facility would be a similar scale to other existing buildings along Route 3. These newly introduced visual elements would not appreciably degrade visual resources and would be consistent with the nature and type of development in the southern portion of MCB Camp Blaz (i.e., the former NCTS) visible from Route 3.

All utilities would be underground and would not impact visual resources. There would be some visual impacts during training activities, particularly during live-firefighting activities when flames could be visible from the various training props, including the training tower. These would primarily occur during daytime hours. Evening training sessions would take place approximately four times per year. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the implementation of BMPs identified in Table 2-5, including shielded lighting.

3.2.3.4.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change and the RFFAs would generally have minimal to no additive impacts to visual resources. Increased frequency and/or intensity of extreme weather events could cause damage and destruction to the FFTF and natural vegetation that contribute to the characteristic landscape of MCB Camp Blaz, but these impacts would likely be temporary. None of the RFFAs are within the same view planes as the Preferred Alternative.

3.2.3.5 Alternative 2 Impact Assessment

A photosimulation of Alternative 2 from KOP 2 is provided in Figure 3-5.

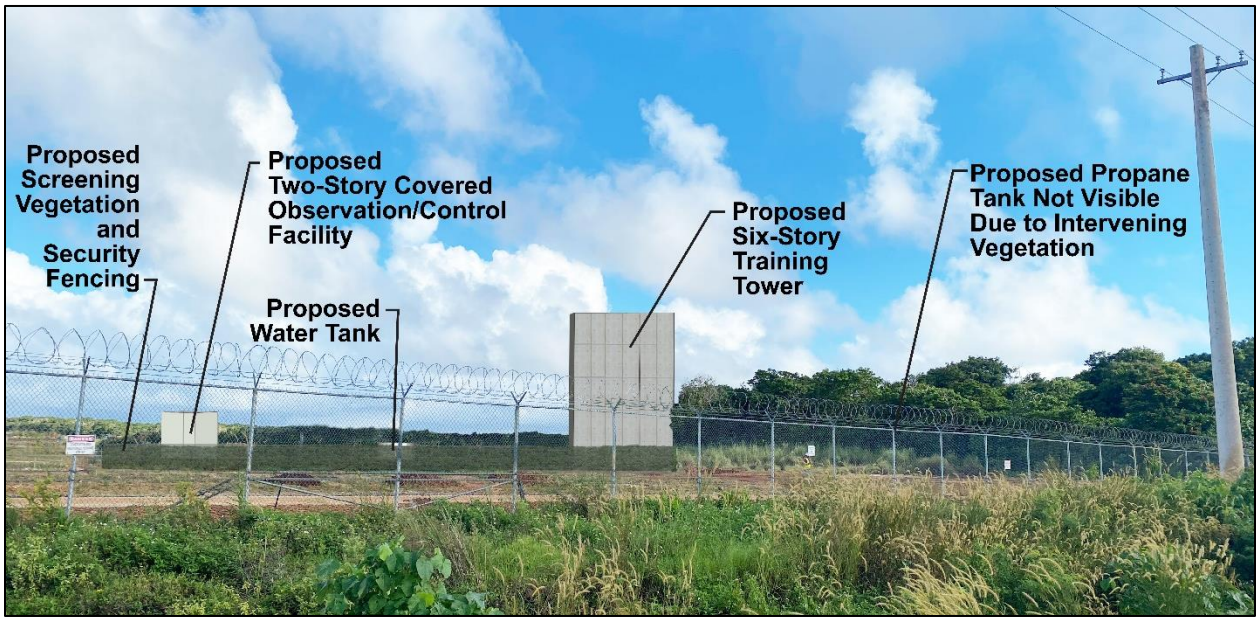


Figure 3-5 Photosimulation of Alternative 2 from Key Observation Point 2

3.2.3.5.1 Construction-related impacts

The increased presence of construction materials and equipment, and/or increased level of construction-related activities would cause minimal visual contrast and impacts during construction and laydown. Vegetation clearing would be required for this site. The vegetation clearing would predominantly occur behind a screen of trees, but a portion of the construction site would be visible in the middle-ground as viewed from Route 3.

3.2.3.5.2 Operations-related impacts

The project would include vegetative screening along the FFTF security fence facing Route 3. Therefore, most of the low-lying visual elements of the FFTF would be screened from view. Operations-related impacts would primarily be associated with a change in landscape character due to the six-story training tower which would be visible from Route 3. Since the Alternative 2 project area is currently forested, the development of the FFTF and the six-story training tower would generate a moderate visual contrast to the surrounding forested areas. However, the lands directly east of the project area have already been cleared for MCB Camp Blaz. Additionally, there would be a remaining forested buffer that would help to obstruct views into the site from Route 3A and portions of Route 3 so the overall visual impacts would be minimal.

All utilities would be underground and will not impact visual resources. There would be some visual impacts during training activities particularly during live-firefighting activities when flames could be visible from the various training props. These would primarily occur during daytime hours. Evening training sessions would take place approximately four times per year. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the implementation of BMPs identified in Table 2-5, including shielded lighting.

3.2.3.5.3 Predictable Environmental Trends Additive Impacts

Potential additive impacts to visual resources from predictable environmental trends associated with climate change and the RFFAs would be the same as discussed for the Preferred Alternative.

3.3 Cultural Resources

This discussion of cultural resources includes historic properties, architectural resources, archaeological resources, and other properties of cultural significance. For the purposes of this analysis, historic properties can be divided into three major categories:

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

3.3.1 Regulatory Setting

Cultural resources are governed by federal laws and Executive Orders (Eos), including the Archeological and Historic Preservation Act (AHPA), American Indian Religious Freedom Act (AIRFA), Archaeological Resources Protection Act of 1979 (ARPA), EO 13007, Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), and National Historic Preservation Act (NHPA). For the purposes of this analysis, the term "cultural resource" refers to all resources of cultural importance protected by these federal laws and Eos.

In compliance with the NHPA, the Navy consults with regulators and other interested parties to identify historic properties and other cultural resources that may be impacted by the Proposed Action. Per the NHPA, historic properties are defined as any district, site, building, structure, or object listed in, or eligible for listing in, the National Register of Historic Places (NRHP). The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office (SHPO). A NRHP-eligible property has the same protections as a property listed in the NRHP. Historic properties include archaeological and architectural resources.

3.3.2 Affected Environment

The Navy has conducted inventories of cultural resources and historic preservation mitigation investigations within the proposed project areas at MCB Camp Blaz to identify and evaluate historical properties that are listed or potentially eligible for listing in the NRHP (Athens 2009; Church et al. 2009; Dixon and Walker 2011; Dixon et al. 2011, 2016, 2017, 2018; Eakin et al. 2012; Haun 1988; Hokanson et al. 2008; Hunter-Anderson et al. 2001; Kurashina et al. 1985; Maxwell et al. 2020; McNeill and Welch 1998; Mohlman 2015; NAVFAC Pacific 2015; Pacheco et al. 2020; Welch 2010; Yee et al. 2004) (Figures 3-6 and 3-7). The eastern half of the Preferred Alternative, overlapping with the softball field, has not been the subject of archaeological survey.

The area of potential effect (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program, or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For the Preferred Alternative, the Navy determined that the APE encompasses 12.8 acres (5.2 hectares) (Figure 3-6). For Alternative 2, the Navy determined that the APE encompasses 17 acres (6.9 hectares) (Figure 3-7).

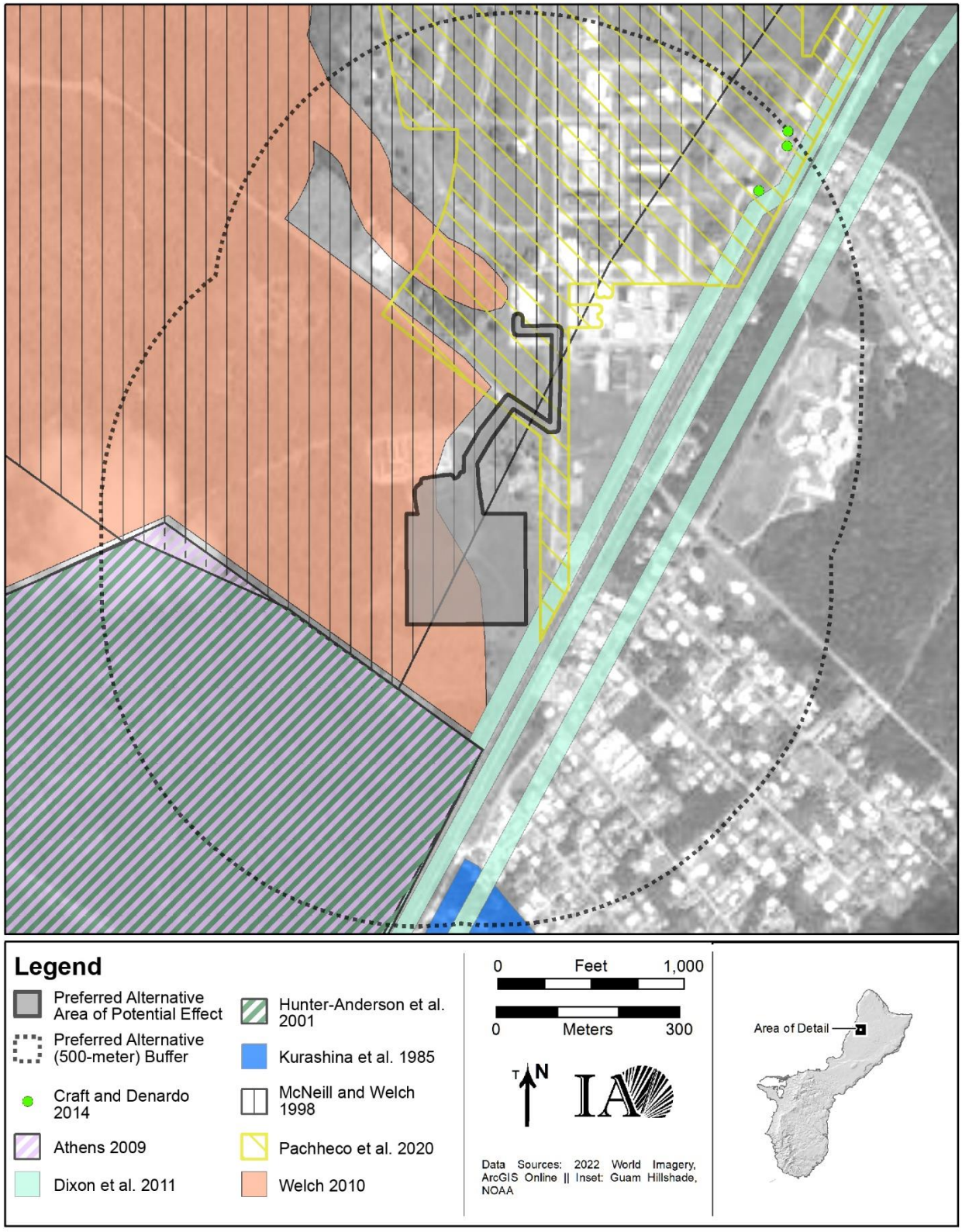


Figure 3-6 Preferred Alternative Area of Potential Effect and Previous Cultural Resources Investigations

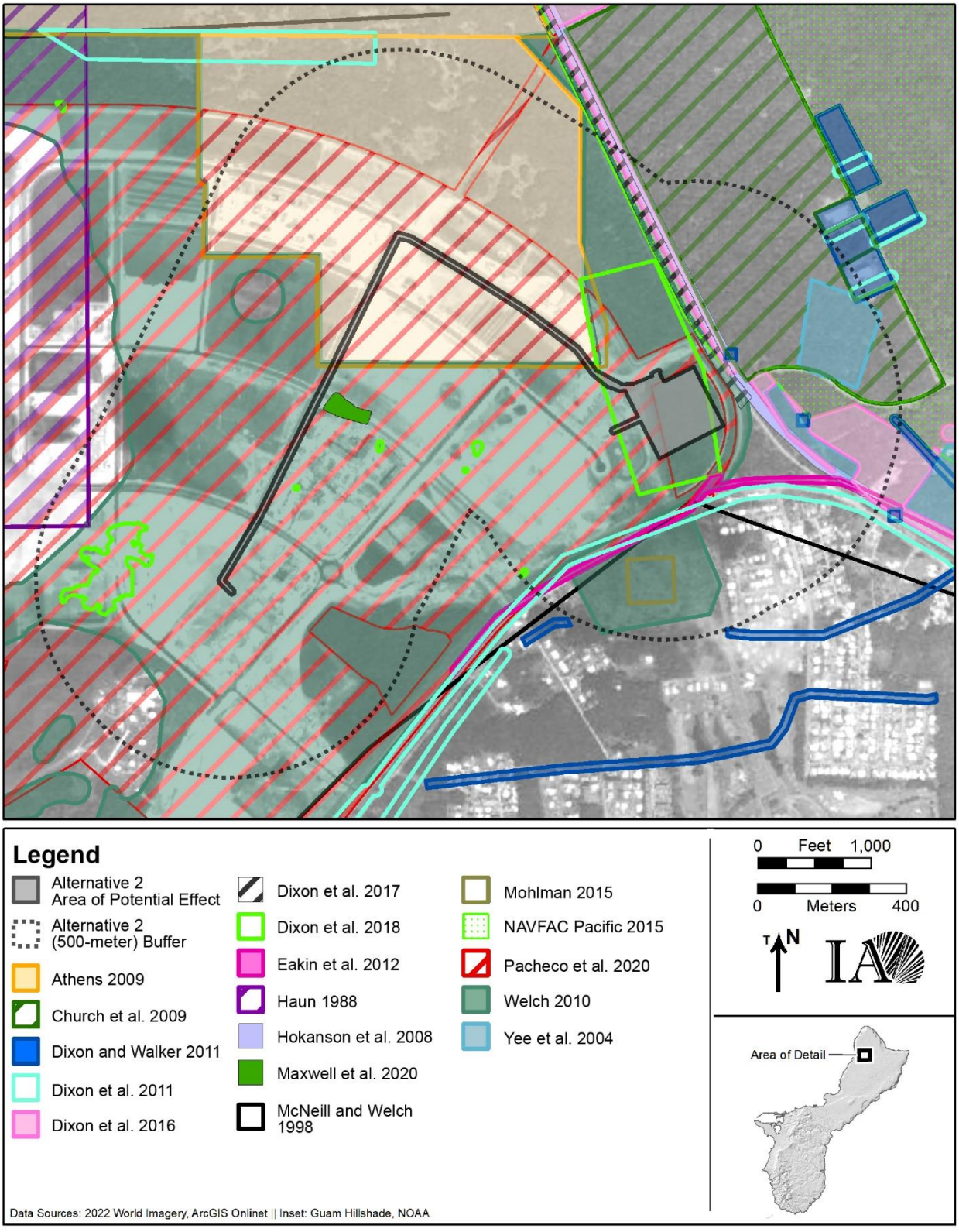


Figure 3-7 Alternative 2 Area of Potential Effect and Previous Cultural Resources Investigations

3.3.2.1 Existing Conditions

3.3.2.1.1 Archaeological Resources

There are no known archaeological sites within the Preferred Alternative APE. There is an existing, temporary artifact staging area (Figure 2-2) within the Preferred Alternative APE. These artifacts were recovered from disturbed contexts during grubbing and clearing of MCB Camp Blaz, and they are not eligible for listing in the NRHP.

The Alternative 2 APE overlaps three known archaeological sites (Table 3-6). All three were mitigated and subsequently substantially impacted by the construction of MCB Camp Blaz. Portions of the Alternative 2 APE are within the former site areas cleared of archaeological features during MCB Camp Blaz construction.

Table 3-6 Previously Recorded Archaeological Sites within the APE for Alternative 2

Site 66-08-	*Type*	*Function/Affiliation*	*Description*	*NRHP Eligibility*	*References*
2293	Concrete foundations	Second American Territorial Period	Concrete foundations, curbed concrete pit, associated historical artifacts	No	Dixon et al. (2018)
2297	Artifact scatter	Latte Period, WWII-Japanese Military Occupation Period	Latte Period surface artifact scatter and WWII Japanese Occupation artifact scatter	No	Dixon et al. (2018)
2305	Complex	Latte Period, First American Territorial Period, Second American Territorial Period	Seabee encampment (concrete foundations, asphalt pads, defensive pits, refuse pits, latrine pits); secondary components are a brick oven ("Spanish oven") and buried Latte Period deposit	Yes (prior to MCB Camp Blaz construction [Project J-001B])	Dixon et al. (2018)

Key: NHRP = National Register of Historic Places; WWII = World War II

Site 66-08-2293 is a complex of concrete foundations, a curbed concrete pit, and associated artifacts from the Second American Territorial Period (Dixon et al. 2018). This site was considered ineligible for listing in the NHRP prior to MCB Camp Blaz construction. Its eligibility should be reevaluated.

Site 66-08-2297 is a multicomponent site comprised of a Latte Period artifact scatter and artifacts related to the WWII-Japanese Military Occupation Period (Dixon et al. 2018). The site was considered ineligible for listing in the NHRP prior to MCB Camp Blaz construction, which further affected its integrity.

Site 66-08-2305 is a 2,000-foot (600-meter) by 1,000-foot (300-meter) Seabee encampment dating to the Second American Territorial Period with older components dating to the First American Territorial and Latte Periods. It consists of 17 features including defensive pits, a fuel pipeline, asphalt pads, concrete foundations, a brick oven (identified as a "Spanish oven"), refuse pits, and latrine pits (Dixon et al. 2018). Excavation adjacent to the brick oven (Feature 6) yielded Chamorro pottery, lithic artifacts, faunal remains, and three fragmentary human skeletal fragments (Dixon et al. 2018). Several features within the Alternative 2 APE were destroyed by MCB Camp Blaz construction (Features 1 [steel drums],

3B [a latrine pit], 5A [asphalt pad], 6 [brick oven], 7 [concrete foundation and latrine], 15 [sinkhole], 16 [concrete foundation], and 17 [cleared area]). Three features, a portion of former fuel pipeline (Feature 2), a refuse dump (Feature 3a), and a naval artillery round crater (Feature 4), are within the Alternative 2 APE and appear to be undisturbed by construction. Dixon et al. (2018) report that integrity of these features is fair to poor. The remaining features are located outside the Alternative 2 APE. Site 66-08-2305 site was considered eligible for listing in the NRHP under Criterion D; however, MCB Camp Blaz construction (Project J-001B) affected its integrity and its eligibility should be reevaluated.

3.3.2.1.2 Architectural Resources and Traditional Cultural Properties

No eligible historical architectural resources are present within the Preferred Alternative or Alternative 2. There are no known traditional cultural properties within the two APEs.

3.3.2.2 Predictable Environmental Trends

3.3.2.2.1 Predictable Trends Associated with Climate Change

One predictable environmental trend associated with climate change (increased frequency and/or intensity of extreme weather events) may influence the known cultural resources (Table 3-7).

Table 3-7 Predictable Environmental Trends for Cultural Resources Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	Not applicable. No reasonably close causal relationships to cultural resources identified.
Change in precipitation patterns	Not applicable. No reasonably close causal relationships to cultural resources identified.
Increased frequency and/or intensity of extreme weather events	Increased frequency and/or intensity of extreme weather events could cause damage and destruction to cultural resources.
Rising Sea Level and Associated Storm Surge	Not applicable. No reasonably close causal relationships to cultural resources identified.
Ocean Acidification	Not applicable. No reasonably close causal relationships to cultural resources identified.

3.3.2.2.2 Predictable Trends Associated with RFFAs

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on cultural resources because none of the RFFAs have a reasonably close causal relationship to cultural resources at the alternative project sites.

3.3.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect effects to historic properties are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable.

3.3.3.1 Nature and Type of Effects

Effects to cultural resources could result from demolition, site preparation, or construction associated with the Proposed Action.

3.3.3.2 Impact Assessment Methodology

The impact methodology includes an evaluation of project impacts on cultural resources, including effects to historic properties and resources that may not meet NRHP criteria but convey cultural significance. Adverse effects occur when an undertaking may directly or indirectly alter characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (NHPA Criteria for Adverse Effect [36 CFR § 800.5(a)(1)]). While NHPA compliance is a critical factor, the assessment of impacts under NEPA considers all impacted cultural resources.

3.3.3.3 No Action Alternative Impact Assessment

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

3.3.3.4 Alternative 1 (Preferred Alternative) Impact Assessment

3.3.3.4.1 Construction and Operations-related impacts

The potential to encounter cultural resources in the Preferred Alternative APE is low. Pacheco et al.'s (2020) geospatial analysis concluded that the entirety of this area was graded to bedrock due to mid-20th century military construction. There would be minimal or no impacts to cultural resources during operation of the proposed FFTF.

The cultural artifacts currently stored at the temporary artifact staging area within the Preferred Alternative APE were recovered from disturbed contexts during grubbing and clearing of MCB Camp Blaz, and they are not eligible for listing in the NRHP. These artifacts will be relocated to a publicly accessible location at the MCB Camp Blaz main gate. These artifacts will be installed with informational signage and other necessary interpretive features with language consulted upon with the Guam SHPO per Part VIIb.1 of the 2011 Guam PA.

As is required under the 2011 PA, the Navy prepared a PA memo documenting its proposed finding of No Historic Properties Affected for the Preferred Alternative. The memo was submitted to the Guam SHPO on March 27, 2023.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to cultural resources.

3.3.3.4.2 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change and the RFFAs would generally have minimal to no additive impacts to cultural resources. Increased frequency and/or intensity of extreme weather events could cause damage and destruction to cultural resources, but the implementation of the Preferred Alternative would not exacerbate those impacts.

3.3.3.5 Alternative 2 Impact Assessment

3.3.3.5.1 Construction and Operations-related impacts

Site 66-08-2305, a former Seabee encampment, is located within the Alternative 2 project area. This site was partially removed by the construction of Marine Corps Base Camp Blaz (Project J-001B). At that time, the Navy completed data recovery for the entire site to mitigate adverse effects associated with Project J001-B.

Construction of Alternative 2 would result in further impacts to Site 66-08-2305, including the removal of Features 2 (former fuel pipeline), 3a (refuse dump), and 4 (naval artillery round crater). These features appear to have been undisturbed by Project J-001B. Prior to construction, the Navy would initiate consultation with the Guam SHPO under the 2011 PA to mitigate potential adverse effects from Alternative 2. Since data recovery was already completed for the entire site under Project J001-B, no further data recovery would be necessary. Additional mitigation measures would likely include performing archaeological monitoring consistent with the 2018 Dispute Resolution agreement between Joint Region Marianas (JRM) and the Guam SHPO.

There would be minimal or no impacts to cultural resources during operations of the FFTF.

Therefore, construction of Alternative 2 would result in less than significant impacts to cultural resources.

3.3.3.5.2 Predictable Environmental Trends Additive Impacts

Predictable environmental trends additive impacts are expected to be the same as described for the Preferred Alternative.

3.4 Terrestrial Biological Resources

Terrestrial biological resources include terrestrial plant and animal species and the habitats within which they occur.

Within this EA, terrestrial biological resources are divided into two major categories: (1) terrestrial vegetation and (2) terrestrial wildlife. Threatened, endangered, and other special status species are discussed in their respective categories.

3.4.1 Regulatory Setting

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

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse-modification of designated critical habitat.

Some migratory and resident bird species are protected under the MBTA and their conservation by federal agencies is mandated by EO 13186 (Migratory Bird Conservation). Under the MBTA, it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation.

3.4.2 Affected Environment

The ROI for terrestrial biological resources includes the Preferred Alternative and Alternative 2 project areas where construction- and operations-related actions may occur.

Background information regarding species observed on MCB Camp Blaz in general is located in the 2015 Supplemental Environmental Impact Statement (SEIS) and the 2022 update of the Integrated Natural Resources Management Plan (INRMP) for Joint Region Marianas (JRM) in Section 9.1.3.4 (Terrestrial Wildlife) and are incorporated by reference (Navy, 2022). The 2019 INRMP update includes a section on MCB Camp Blaz.

3.4.2.1 Existing Conditions

3.4.2.1.1 Terrestrial Vegetation

Vegetation communities vary between the two alternative locations due to their locations and extent of existing development.

Preferred Alternative

The Preferred Alternative project area currently consists of tennis courts, a softball field, parking areas, and maintained lawns (Figure 2-1). A fringe of limestone degraded forest community (0.1 acres [0.04 hectares]) occurs along the western edge of the Preferred Alternative proposed project area with the remainder in developed land as defined in the INRMP. These vegetation communities are described below.

Developed Land: These are human-occupied or otherwise highly disturbed areas that include lawns and other landscaped areas or actively maintained areas (e.g., mowed fields, utility corridors, etc.), buildings, roads, parking lots, and other paved areas.

Degraded Limestone Forest: Limestone forest plant communities in many areas have been significantly disturbed by clearing, invasive plants, and introduced animal species. This plant community has one or more of the following characteristics: (1) dominated by a variety of non-native woody species, (2) substantial forest clearings visible in aerial imagery, or (3) dominated by pago *(Hibiscus tiliaceus*), a native tree species usually indicative of disturbance in Guam's limestone forests. The most common

non-native tree species in limestone degraded forest are *Vitex (Vitex parviflora*), a non-native medium- to large-sized tree (in many areas it forms a monotypic canopy and this community type is separated and described below) or tangantangan (*Leucaena leucocephala*). Native tree species in these forests usually include one or more of the following: ahgao *(Premna serratifolia),* kafu *(Pandanus tectorius),* paipai *(Meiogyne cylindrocarpa),* and mapunyao *(Aglaia mariannensis)* (Navy, 2022).

Alternative 2

The Alternative 2 project area has been cleared along the western edge for previous MCB Camp Blaz cantonment construction with the remaining area mostly consisting of *Vitex* forest . The Alternative 2 project area consists of approximately 1.5 acres (0.6 hectares) of developed land (defined above), 0.5 acres (0.2 hectares) of *Spathodea* forest along the southern edge, and 7.2 acres (2.9 hectares) of *Vitex* forest (described below).

***Vitex* Forest:** This community is usually dominated by *Vitex*, a medium- to large-sized tree in the canopy layer. In some areas, pago *(Hibiscus tiliaceus*) may also be scattered through the community. The understory is often dominated by the native kafu (*Pandanus tectorius)*, which may be present as small trees, shrubs, or saplings.

***Spathodea* Forest:** This forest community is heavily dominated by the non-native African tulip tree (*Spathodea campanulata*).

High value trees are plant species that have cultural and/or ecosystem value and require additional handling and processing procedures during pre-construction clearing activities on JRM-administered lands (Navy, 2022). The Preferred Alternative consists of developed land with no high value trees within the proposed footprint. Alternative 2 is mostly forested and contains one species of high value tree: *Elaeocarpus joga* (Navy, 2022).

3.4.2.1.2 Terrestrial Wildlife

Since terrestrial wildlife surveys have not been conducted recently within the project footprint, this analysis is based on species observations throughout MCB Camp Blaz as described in the 2019 update of the INRMP (Navy, 2022). Table 3-8 lists species observed on MCB Camp Blaz, although few of the species are likely to occur or utilize the developed landscape that dominates the Preferred Alternative. Protected species are described in Section 3.4.2.1.3. Since no natural surface water bodies occur at either alternative location, freshwater species are not present.

Table 3-8 Terrestrial Wildlife Species Occurring within MCB Camp Blaz

Common Name	***Scientific Name***	***Status***
Mammals		
Norway rat	*Rattus norvegicus*	Non-native
Black rat	*Rattus*	Non-native
Polynesian rat	*Rattus exulans*	Non-native
House mouse	*Mus musculus*	Non-native
Musk shrew	*Suncus murinus*	Non-native
Feral cats	*Felis catus*	Non-native
Dogs	*Canis lupus*	Non-native
Feral pigs	*Sus scrofa*	Non-native
Philippine deer	*Rusa marianna*	Non-native

Table 3-8 Terrestrial Wildlife Species Occurring within MCB Camp Blaz

Common Name	*Scientific Name*	*Status*
Reptiles		
Brown treesnake	*Boiga irregularis*	Non-native
Curious skink	*Carlia ailanpalai*	Non-native
Pacific blue-tailed skink	*Emoia caeruleocauda*	Native
Mutilating gecko	*Gehyra mutilata*	Native
Mourning gecko	*Lepidodactylus lugubrus*	Native
House gecko	*Hemidactylus frenatus*	Non-native
Brahminy blind snake	*Indotyphlops braminus*	Non-native
Pacific monitor lizard	*Varanus indicus*	Native
Amphibians		
Greenhouse frog	*Eleutherodactylus planirostris*	Non-native
Crab-eating frog	*Fejervarya cancrivora*	Non-native
Eastern dwarf frogs	*Litoria fallax*	Non-native
Hong Kong whipping frog	*Polypedates braueri*	Non-native
Gunther's Amoy frog	*Sylvirana guentheri*	Non-native
Marine toad or Cane toad	*Rhinella* (=*Bufo*) *marina*	Non-native
Greenhouse frog	*Eleutherodactylus planirostris*	Non-native
Birds		
Black drongo	*Dicrurus macrocerus*	Non-native
Island collared dove	*Streptopelia bitorquata*	Non-native
Black francolin	*Francolinus francolinus*	Non-native
Pacific golden plover	*Pluvialis fulva*	Native (migrant)
Yellow bittern	*Ixobrychus sinensis*	Native
Rock dove	*Columba livia*	Non-native
Eurasian tree sparrow	*Passer montanus*	Non-native
Invertebrates		
Asian land snail	*Satsuma sp.*	Non-native
African snail	*Achatina fulica*	Non-native
Rosy wolf snail (shells only)	*Euglandina rosea*	Non-native
New Guinea flatworm	*Platydemus manokwari*	Non-native
Land hermit crabs	*Coenobita brevimanus*	Native
Coconut crabs	*Birgus latro*	Native
Asian cycad scale	*Aulacaspis yasumatsui*	Non-native
Erythrina gall wasp	*Quadrastichus erythrinae*	Non-native
Coconut rhinoceros beetle	*Oryctes rhinoceros*	Non-native
20 species of ants		Non-native
17 species of mosquitos		Non-native

Source: Navy, 2022

3.4.2.1.3 Threatened and Endangered Species

Table 3-9 lists federal and territorial threatened and endangered species with the potential to occur within each alternative footprint. The list is derived from the 2022 INRMP and is based on species occurring within MCB Camp Blaz (Navy, 2022). The Preferred Alternative footprint was surveyed for threatened and endangered species in October 2020 and lacks habitat for most species listed in Table 3-9. No federal or territorially protected species were observed within the Preferred Alternative footprint.

The Alternative 2 footprint was surveyed more than once over several years as part of MCB Camp Blaz pre-construction preparation and five *Tuberolabium guamense* orchids were documented in 2015. The Alternative 2 project area includes forested habitat, but is isolated on all sides by cleared land, roads, and fences, which would limit movement of smaller species such as tree snails and skinks into the proposed footprint.

Transient species such as the Mariana fruit bat (*Pteropus mariannus mariannus*) and Micronesian starling (*Aplonis opaca*) may fly over or use the area proposed for the FFTF intermittently. The nearest known Micronesian starling breeding population is located on the east side of Andersen Air Force Base (AAFB), over five miles (eight kilometers) away.

From 2010 to 2013, a single Mariana fruit bat was observed six times near MCB Camp Blaz, mostly along Route 3A and near the AAFB Habitat Management Unit. Mariana fruit bats have also been observed annually from 2015 through 2019 along Route 3A during AAFB bat surveys (Navy, 2022).

Mariana fruit bats have been observed to use the nearby Haputo Ecological Reserve Area (ERA) for foraging, though none were observed within the ERA during the 2019, 2020, and 2021 island-wide surveys conducted by AAFB. The closest known roost site is on AAFB. The site of the MCB Camp Blaz main cantonment required approximately 740 acres (299 hectares) of land clearing and, on average, 800 construction personnel have been onsite daily in the area since 2017. As part of the construction program, surveys for Mariana fruit bats have been conducted and no Mariana fruit bats have been observed during surveys by the MCB Camp Blaz environmental team or the construction contractors. However, one Mariana fruit bat was observed by a MCB Camp Blaz environmental team member while driving along Route 3.

No critical habitat has been designated on Department of Navy land, which includes the proposed project footprints for both alternatives.

Table 3-9 Threatened and Endangered Specieis Known to Occur or Potentially Occuring Near the Proposed Action Footprint

Common Name/ Chamorro Name[(1)]	*Scientific Name*	*Federal Status*	*Guam Status*	*Observed in Project Area*
Mammals				
Mariana fruit bat/Fanihi	*Pteropus mariannus mariannus*	*FT*	*TE*	*N*
Birds				
Micronesian starling/Sali	*Aplonis opaca*	*--*	*TE*	*N*
Reptiles				
Moth skink/Gualiek halumtano	*Lipinia noctua*	*--*	*TE*	*N*
Azure-tailed skink/Gualiek halumtano	*Emoia cyanura*	*--*	*TE*	*N*
Pacific slender-toed gecko/Gualiek	*Nactus pelagicus*	*--*	*TE*	*N*
Invertebrates				
Humped tree snail/Akaleha	*Partula gibba*	*FE*	*TE*	*N*
Guam tree snail/Akaleha	*Partula radiolata*	*FE*	*TE*	*N*
Fragile tree snail/Akaleha	*Samoana fragilis*	*FE*	*TE*	*N*
Mariana eight-spot butterfly/Abaabang	*Hypolimnas octocula marianensis*	*FE*	*--*	*N*
Plants				
None/None	*Tuberolabium guamense*	*FT*	*--*	*Alternative 2*

Selections for Listing Status Column include: FE = federal endangered; FT = federal threatened; TE = Territorial endangered
Source: Navy, 2022

3.4.2.2 Predictable Environmental Trends

Several environmental trends are likely to affect habitats and species on Guam. Climate change may change historical precipitation, temperature, and extreme weather events on Guam affecting fire frequency, drought conditions, flooding, and the spread of invasive species. Potential implications of climate change for terrestrial biological resources is summarized in Table 3-10.

Invasive species have already had severe impacts on Guam native species with the brown treesnake affecting all endemic bird species. More recent introductions such as cycad scale, little blue butterfly, and the coconut rhinoceros beetle have decimated the populations of the once most common trees on Guam—the Micronesian cycad and the coconut tree. Although more stringent biosecurity measures have been implemented in recent years, it is likely that additional invasive species introductions will occur and that already introduced invasive species will continue to impact native habitats and species.

Table 3-10 Predictable Environmental Trends for Terrestrial Biological Resources Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	The rise in global temperatures is causing instability in terrestrial ecosystems and could aid the spread of some invasive species. Increased risk of wildfire.
Change in precipitation patterns	Changes in precipitation patterns could impact the diverse microclimates on Guam, alter vegetation communities and habitat suitability for wildlife, aid the spread of some invasive species, and increase the risk of wildfire.

Table 3-10 Predictable Environmental Trends for Terrestrial Biological Resources Associated with Climate Change

Predictable Trend	*Influence on Resource*
Increased frequency and/or intensity of extreme weather events	Extreme weather events have potential to destroy rare and endangered populations of plants and wildlife that have small population ranges and strict habitat requirements.
Rising Sea Level and Associated Storm Surge	Not applicable
Ocean Acidification	Not applicable

3.4.2.2.1 Predictable Trends Associated with RFFAs

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on terrestrial biological resources because none of the RFFAs are located within the ROI for this project.

3.4.3 Environmental Consequences

This section discusses the potential short- and long-term effects to terrestrial biological resources that could result from implementation of the action alternatives and the no-action alternative. This analysis focuses on wildlife or vegetation types that are important to the function of the ecosystem or are protected under federal or state law or statute. Direct and indirect effects from proposed activities within the ROI have been evaluated herein based upon: (1) an understanding of the methods and equipment that would be used during construction and operation of facilities, (2) knowledge of the potential for such methods and equipment to disturb the natural resources on which the subject species depend, and (3) awareness of the types of effects that have resulted from similar actions in the past.

3.4.3.1 No Action Alternative Impact Assessment

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

3.4.3.2 Alternative 1 (Preferred Alternative) Impact Assessment

3.4.3.2.1 Vegetation

The Preferred Alternative would remove 9.2 acres (3.7 hectares) of developed land and 0.1 acres (0.04 hectares) of degraded limestone forest from the initial land clearing and grading. There are no high value trees or patches of high-quality habitat within the proposed footprint. Since this habitat is already developed or degraded, its loss would have minimal effect on natural habitats on MCB Camp Blaz in both the short- and long-term. Additionally, the Navy would plant new vegetative screening along the east and south edge of the FFTF perimeter fence.

Operation of the FFTF would involve live-firefighting training at the propane-field mockups and in the training tower. The hay/wood pallet fires would be confined to the interior of the training tower and would not present a hazard of wildfires. There are no anticipated direct or indirect effects to vegetation adjacent to the facility associated with construction or operations of the Preferred Alternative.

3.4.3.2.2 Terrestrial Wildlife

The Preferred Alternative project area is dominated by existing developed land that contains tennis courts, a softball field, and parking areas that do not provide quality habitat for native terrestrial wildlife. Some lizard species and bird species such as the migratory Pacific golden plover, the black drongo, or Eurasian tree sparrow may occasionally forage in the grassy fields or adjacent shrubs.

Minor adverse effects to wildlife would be expected as a result of construction activity and construction and operations noise. Ground disturbance and noise from vehicle use or construction is likely to temporarily cause foraging or resting lizards and birds to avoid the area within and adjacent to the construction zone. Operational noise is described more fully in Section 3.5.

Potential adverse effects on migratory birds would be avoided or minimized by implementing best management practices described in Table 2-5 that include pre-construction MBTA nest searches and shielded lighting.

Because this area is already developed or degraded, its use for the FFTF would have minimal effect on terrestrial wildlife on MCB Camp Blaz in the long-term. Operations of the FFTF would not affect wildlife in the area as wildlife in this area is already habituated to light and noise.

3.4.3.2.3 Threatened and Endangered Species

The Preferred Alternative project area is dominated by existing developed land that contains tennis courts, a softball field, and parking areas that do not provide quality habitat for threatened and endangered species.

Short-term minor effects to protected species could result from construction activity and noise. Ground disturbance and noise from vehicle use or construction is likely to temporarily cause transiting or foraging bats or birds to avoid the area within and adjacent to the construction zone.

To avoid or minimize impacts to Mariana fruit bats, the following would be conducted:

1. The Navy would ensure that all construction activities would occur within the limits of construction to prevent additional habitat loss. Limits of construction must be shown on contract plans and specifications and physically demarcated in the field prior to any vegetation clearing. This measure is intended to prevent additional habitat loss. The measure would be implemented during pre-construction and construction.
2. Pre-construction surveys for Mariana fruit bats would be conducted by a qualified biologist the day before and the day of vegetation clearing of Mariana fruit bat habitat.
    a. Qualified biologist is defined as a person who has successfully completed a full four-year course of study in an accredited college or university leading to a bachelor's or higher degree, which includes a major field (24 semester hours) of study in biological sciences, wildlife biology, botany, natural resource management, environmental sciences, or related disciplines appropriate to this position or an appropriate combination in education and experience and a minimum of 100 documented hours conducting Mariana fruit bat surveys or monitoring or closely related species.
3. Construction contractors would be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint at the start of each day where noise generating equipment would be used. If Mariana fruit bats are observed prior to the start of

work in the project footprint, work would be postponed until the Mariana fruit bat has left the area of its own volition. If bats enter the project footprint after the start of construction, work would continue.

4. Operators of the FFTF would be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint prior to use of the facility. If Mariana fruit bats are observed prior to the start of training, work would be postponed until the Mariana fruit bat has left the area of its own volition. If bats enter the project footprint after the start of training, work would continue.
5. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the use of shielded outdoor lights to protect Mariana fruit bats.
6. The Navy would specify housekeeping and vehicle cleanliness measures in contractor environmental plans to reduce the likelihood of spread of invasive species within the construction area. To the extent practicable and to be performed in conjunction with stormwater pollution prevention practices, cargo and vehicles would be inspected upon entry to the construction site and high-pressure wash-down would be performed to reduce organic material and mud from leaving or entering the jobsite. Dirty vehicles, equipment or cargo would be cleaned of dirt, debris, organisms, weeds and other material before they enter the jobsite and discarded material would be tested, packaged or treated before disposal. Green waste would be reused on-base to the greatest extent practicable and would be managed to reduce Coconut Rhinoceros Beetle and Little Fire Ant spread or breeding.

Since this area is already developed or degraded and there are no plans to restore habitat, construction and operation of the FFTF would have minimal long-term effects on protected species. Operations of the FFTF would not affect wildlife in the area as wildlife in this area is already habituated to light and noise.

In accordance with Section 7 of the ESA, the Navy is conducting formal consultation with the USFWS regarding the Preferred Alternative. The Navy determined that the Preferred Alternative is likely to adversely affect the federally-listed threatened Mariana fruit bat (*Pteropus mariannus mariannus*) in a letter to the USFWS dated May 2, 2023 (see Appendix B).

3.4.3.2.4 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change are likely to negatively impact protected species and habitats in the future. None of the RFFAs are located within the ROI for terrestrial biological resources. The Preferred Alternative would introduce eight acres (3.2 hectares) of new impervious surface, which would contribute to a heat island effect in the immediate vicinity especially in light of rising temperatures due to climate change. This would be partially offset by planting approximately 0.3 acres (0.1 hectares) of new vegetation in the proposed vegetation screening area along the FFTF perimeter fence facing Route 3. Since no protected species or quality habitat occurs within the Preferred Alternative footprint, the Preferred Alternative is not expected to contribute significant additive impacts to the predictable environmental trends associated with climate change.

3.4.3.3 Alternative 2 Impact Assessment

3.4.3.3.1 Vegetation

Alternative 2 would remove approximately 1.5 acres (0.6 hectares) of developed land, 0.5 acres (0.2 hectares) of *Spathodea* forest, and 7.2 acres (2.9 hectares) of *Vitex* forest. There are nine high value trees (*Elaeocarpus joga*) within the footprint that would be removed. The vegetation communities are dominated by non-native species and the proposed project area is a fragment of forest located between the MCB Camp Blaz, Route 3, and Route 3A, which limits its value as habitat. Since this habitat is already relatively low quality, its loss would have minimal effect on natural habitats on MCB Camp Blaz in both the short- and long-term. Additionally, the Navy would plant new vegetative screening along the southwest edge of the FFTF perimeter fence.

Indirect effects from clearing the project footprint on vegetation adjacent to the facility could include increased risk of windthrow (the uprooting and overthrowing of trees by the wind) and increased understory and invasive species growth due to increased sunlight along the cleared edge. Operation of the FFTF would involve live-firefighting training at the propane-field mockups and in the training tower. The hay/wood pallet fires would be confined to the interior of the training tower and would not present a hazard of wildfires.

3.4.3.3.2 Terrestrial Wildlife

The habitats impacted by Alternative 2 consist primarily of *Vitex* forest, developed land, and a small amount of *Spathodea* forest (non-native African tulip tree). The proposed footprint is isolated by roads and the adjacent development at MCB Camp Blaz. It is likely dominated by non-native mammal, lizard, and invertebrate species with some native lizards occurring within the footprint (Table 3-8). With ongoing construction to the west and heavy construction traffic through the commercial gate to the north, species sensitive to human disturbance have likely already been impacted or left the site.

Short-term minor adverse effects to wildlife would be expected as a result of construction activity and noise. Ground disturbance and noise from vehicle use or construction is likely to temporarily cause foraging lizards and birds to avoid the area within and adjacent to the construction zone.

Adverse effects on migratory birds would be avoided or minimized by using best management practices described in Table 2-5 that include pre-construction MBTA nest searches and shielded lighting.

Construction of paved surfaces, buildings, and maintained lawns protected by an 8-foot fence would provide limited habitat for most species in the long-term.

3.4.3.3.3 Threatened and Endangered Species

One federally protected species was identified within the Alternative 2 footprint during surveys in 2015: five *Tuberolabium guamense* orchids growing on non-native *Vitex parviflora* trees. Conservation measures require that healthy *Tuberolabium guamense* individuals be transplanted into protected areas where feasible (USFWS, 2017). The current number and condition of the protected orchids is uncertain since the last survey was conducted in 2015.

Short-term minor effects to other protected species could result from construction activity and noise. Ground disturbance and noise from vehicle use or construction is likely to temporarily cause transiting or foraging bats or birds to avoid the area within and adjacent to the construction zone. This is likely already occurring due to the construction activity occurring within the adjacent cantonment. Effects on the federally-listed threatened Mariana fruit bat (*Pteropus mariannus mariannus*) would be minimized by implementing the same avoidance and minimization measures as for the Preferred Alternative (see Section 3.4.3.2.3).

Since this area is already marginal habitat, construction and operation of the FFTF would have minimal long-term effects on protected species on MCB Camp Blaz if remaining *Tuberolabium guamense* orchids are transplanted to an alternative location.

With the implementation of the conservation measures designed to protect threatened and endangered species implementation of Alternative 2 may affect but is unlikely to adversely affect threatened *Tuberolabium guamense* orchids and threatened Mariana fruit bat (*Pteropus mariannus mariannus*).

3.4.3.3.4 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change are likely to negatively impact protected species and habitats in the future. Once the *Tuberolabium guamense* orchids are transplanted from the Alternative 2 footprint, no federally protected species would remain. Since the habitat is of marginal quality due to the location and existing invasive species (*Vitex parviflora* and the African tulip tree), removal would have a negligible additive impact to terrestrial biological resources.

3.5 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment.

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

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual.

3.5.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be comfortably heard by the human ear have intensities a trillion times higher than those of sounds barely heard. Because of this vast range, it is unwieldy to use a linear scale to represent the intensity of sound. As a result, a logarithmic unit known as the decibel (abbreviated dB) is used to represent the intensity of a sound, also referred to as the sound level. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 and 140 dB are felt as pain (Berglund and Lindvall, 1995).

All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second, or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale, which places less weight on very low and very high frequencies in order to replicate human hearing sensitivity. The general range of human hearing is from 20 to 20,000 cycles per second, or Hz; humans hear best in the range of 1,000 to 4,000 Hz. A-weighting is a frequency-dependent adjustment of sound level used to approximate the natural range and sensitivity of the human auditory system. Table 3-11 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3-11 Subjective Responses to Changes in A-Weighted Decibels

Change	*Change in Perceived Loudness*
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Figure 3-8 (Cowan, 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

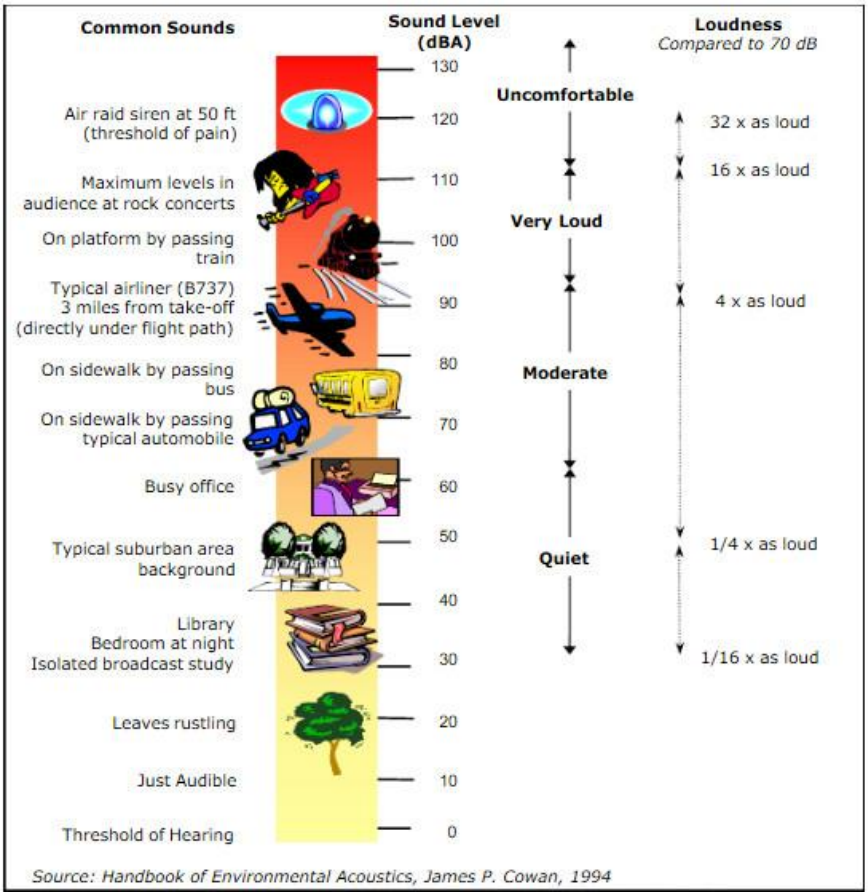


Figure 3-8 A-Weighted Sound Levels from Typical Sources

3.5.2 Regulatory Setting

The Navy considers territory regulations for noise-sensitive land uses when evaluating potential impacts. Under the Guam Department of Public Works policy, loudest hourly noise level [L_{eq} (h)] standards are established for traffic noise relative to land use activity categories, as summarized in Table 3-12.

Table 3-12 Guam Loudest Hourly Noise Standards for Transportation Noise and Land Use

Activity Category	*L_{eq} (h) dBA*	*Description of Activity Category*
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, places of worship, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditor.

Key: L_{eq} (h)[1] = loudest hourly noise level; dBA = A-weighted decibel
Source: Guam Department of Public Works, 2009.

3.5.3 Affected Environment

The ROI for noise encompasses land within a half-mile of the Proposed Action project areas at MCB Camp Blaz. This section describes the nearest noise-sensitive receptors in the ROI and their distances from potential project activity (Figures 3-9 and 3-10). Noise-sensitive receptors occur at locations where their typical uses include activities sensitive to noise. Common noise-sensitive receptors include residential, educational, health, and religious structures.

3.5.3.1 Existing Conditions

Ambient airborne sound is a composite of sounds from multiple sources, including environmental events, biological sources, and human-induced activities. The existing noise environment at MCB Camp Blaz primarily includes vehicle traffic along Route 3 and Route 3A and construction equipment operations associated with the MCB Camp Blaz construction. Noise-sensitive receptors in the vicinity of MCB Camp Blaz include residential homes and Finegayan Elementary School.

There are several private residential neighborhoods located directly across Route 3 from MCB Camp Blaz. The analysis focuses on the potential noise impacts to the homes located nearest to the Preferred Alternative and Alternative 2 project sites since they would experience the greatest potential impacts. There are several homes along the east side of Route 3 directly across from the Preferred Alternative project area adjacent to the existing gas station (Figure 3-9). The nearest home is located 300 feet (91 meters) west of the Preferred Alternative project area. The 2010 EIS for Guam and Commonwealth of the Northern Marianas (CNMI) Military Relocation conducted long-term noise measurements in the vicinity of these homes and found that noise associated with peak-hour traffic (7:00 a.m., 2:00 p.m., and 5:00 p.m.) reached 68.0 A-weighted decibels (dBA) at this location (JGPO, 2010).

Finegayan Elementary School is located along Mepa Street approximately 1,200 feet (366 meters) west of the Preferred Alternative project area (Figure 3-9). There is an existing 300-foot (91 meters)-wide vegetative buffer between the elementary school and Route 3. There is no baseline environmental noise data available for this location.

The nearest residence to the Alternative 2 project site is located approximately 600 feet (183 meters) south of the Alternative 2 project area across Route 3 and along Chalan San Joaquin (Figure 3-10). There is no baseline environmental noise data available for this location.

Starts Guam Golf Resort is located directly south of the Alternative 2 project area (Figure 3-10). The golf course is approximately 2,100 feet (640 meters) from the closest point of the Alternative 2 project area. There is an existing forested area, residential homes, the golf course access road, and Route 3 between the golf course and the Alternative 2 project area. There is no baseline environmental noise data available for this location.

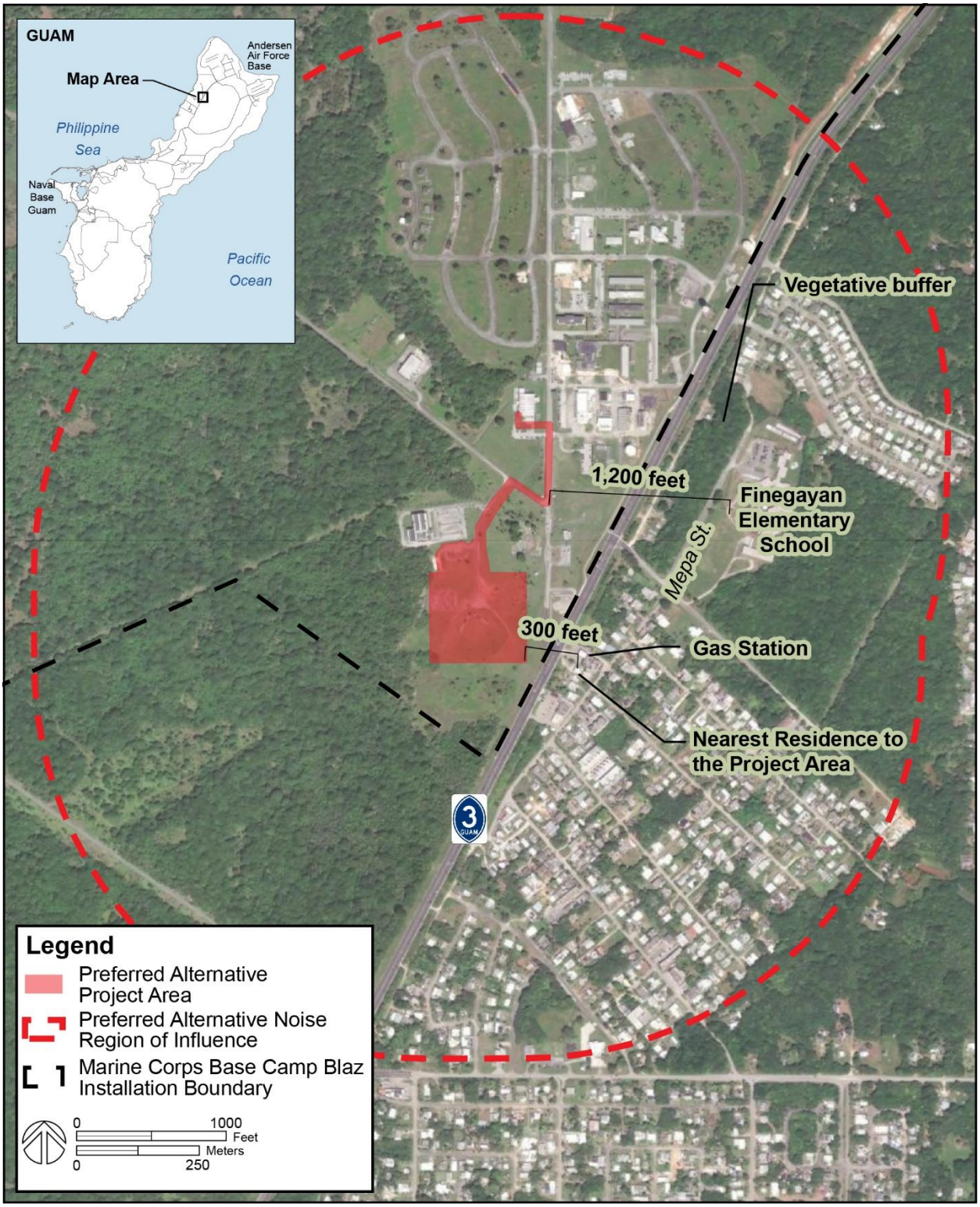


Figure 3-9 Noise Sensitive Receptors in the Vicinity of the Preferred Alternative

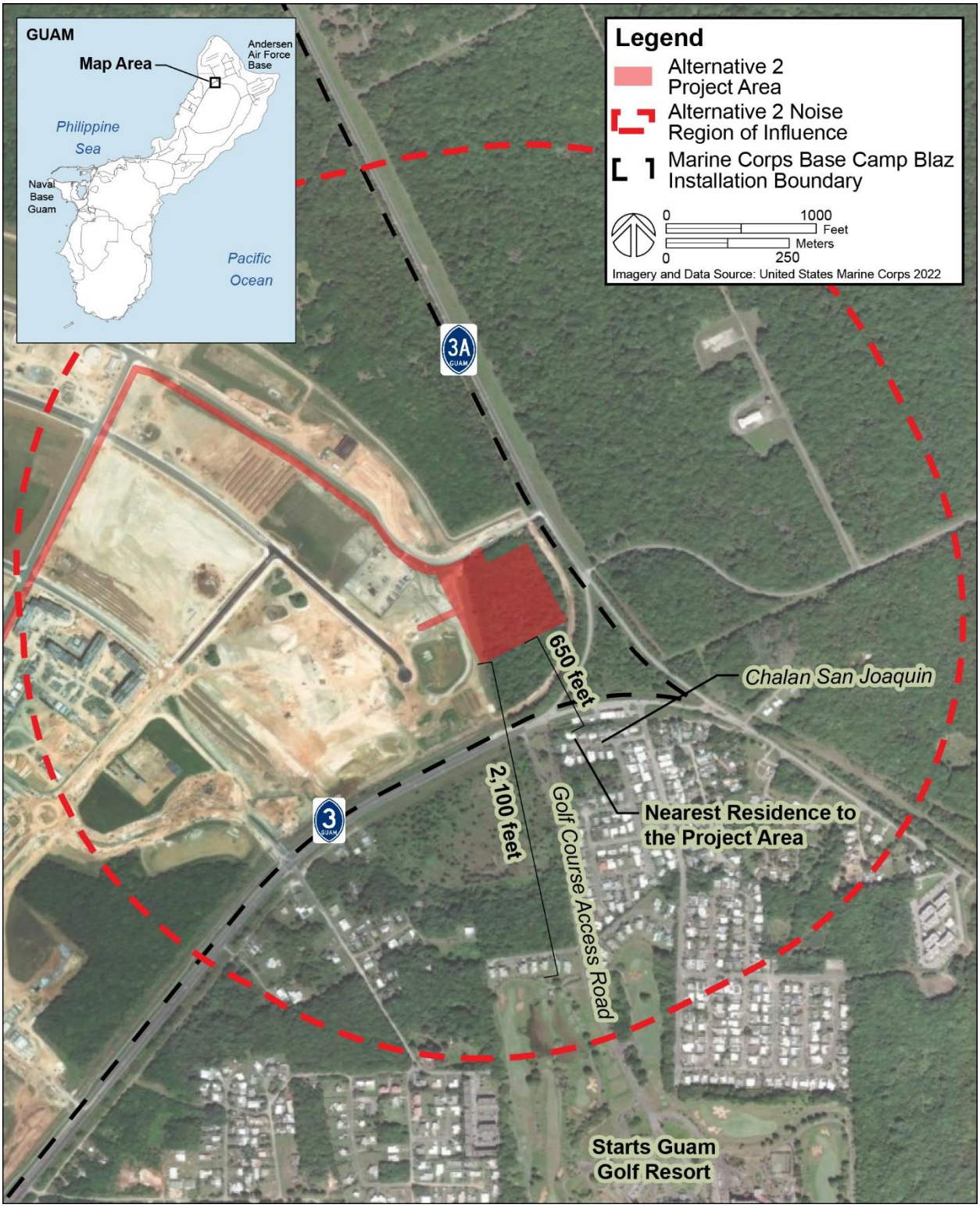


Figure 3-10 Noise Sensitive Receptors in the Vicinity of Alternative 2

3.5.3.2 Predictable Environmental Trends

3.5.3.2.1 Predictable Trends Associated with Climate Change

No substantial changes to the noise environment are anticipated due to the predictable environmental trends associated with climate change.

3.5.3.2.2 Predictable Trends Associated with Reasonably Foreseeable Future Actions

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on noise because none of the projects are located within the ROI.

3.5.4 Environmental Consequences

This section estimates potential noise levels and impacts from the Proposed Action and alternatives to noise-sensitive receptor sites.

An extensive amount of research has been conducted regarding noise effects, including annoyance, speech interference, classroom/learning interference, sleep disturbance, effects on recreation, potential hearing loss, and non-auditory health effects.

The construction of the Proposed Action would generate noise and warrants analysis as a contributor to the total noise impact. Impact assessment methodology compares calculated noise levels anticipated to occur due to the action alternatives to the existing noise environment and the Guam Loudest Hourly Noise Standards for Transportation Noise and Land Use identified in Table 3-12. The Inverse Square Law was used to measure sound attenuation from the Proposed Action to the noise sensitive receptors. The loudest type of equipment has been modeled at the nearest point of operation to noise-sensitive receptors for impact analysis to provide a “worst-case” scenario.

3.5.4.1 No Action Alternative Impact Assessment

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the noise environment. Therefore, no impacts to the noise environment would occur with implementation of the No Action Alternative.

3.5.4.2 Alternative 1 (Preferred Alternative) Impact Assessment

3.5.4.2.1 Construction-related Impacts

During project construction, there would be short-term, temporary noise impacts to the noise environment in the vicinity of the project area. The greatest noise impacts would be to residential dwellings directly across Route 3 from the Preferred Alternative project area (Figure 3-9). The dominant noise sources during construction would be from the operation of construction equipment, which would be conducted during normal daytime working hours.

Typical noise emission levels of construction equipment are reported in Federal Highways Administration (FHWA) construction noise level guidance (FHWA 2006, Table 12-1). For the purposes of this analysis, the loudest equipment to be used during construction was used to determine the potential impacts to nearby noise sensitive receptors as a worse-case scenario. For the Preferred Alternative the loudest construction equipment to be used would likely be a compactor, which has a measured maximum noise level (L_{max}) of 83 dBA at a reference distance of 50 feet (15 meters).

In accordance with the inverse square law, there is an approximate 6 dBA decrease in sound level with every doubling of the reference distance. A calculation of the reduction in atmospheric sound level from the reference distance to the nearest noise sensitive receptors indicated that noise from the compactor would be attenuated to 67.4 dBA at the nearest residence along Route 3 (approximately 300 feet [91 meters]) (Figure 3-9). This noise level would slightly exceed the Guam Loudest Hourly Noise Standards identified for the exterior of residences (67 dBA, activity category B). However, it would generally be in line with the existing peak hour traffic noise measured along Route 3 in that location (68 dBA) (JGPO, 2010).

Finegayan Elementary School is another noise sensitive receptor in the vicinity of the Preferred Alternative. It is located approximately 1,200 feet (366 meters) east of the nearest point of the Preferred Alternative project area (Figure 3-9). At this distance the noise levels associated with the loudest construction equipment (i.e., compactors) are estimated at 55.4 dBA. This is below the Guam Loudest Hourly Noise Standards for the exterior of schools (67 dBA, activity category B).

3.5.4.2.2 Operations-related Impacts

During the operational period, the implementation of the Preferred Alternative would generate noise associated with several components of the training operations at the FFTF. Emergency vehicles operating on the EVOC would generate some noise associated with vehicle travel, but this would be similar to existing traffic noise along Route 3 which separates the FFTF from the noise sensitive receptors. Sirens and alarms would only be used in the event of an actual emergency, similar to existing emergency vehicle transit along Route 3. The FFTF would include a public address system, but it would only be used in the case of an emergency. Typical training communications would be conducted via two-way radios and would not contribute to the overall noise environment in the ROI.

Training on the firefighting mockups would also generate noise associated with operating equipment during the training sessions (i.e., fire trucks, fire hoses, axes, chain saws, etc.). The noise generated from the training sessions would be temporary and would only occur during the active portions of training sessions, typically during daytime hours. Typical noise exposure levels for firefighter training are reported by Root et al. (2013), *Firefighter Noise Exposure During Training Activities and General Equipment Use*. For the purposes of this analysis, the loudest equipment to be used during training was used to determine the potential impacts to nearby noise sensitive receptors as a worse-case scenario. The loudest training equipment likely to be used at the FFTF are chain saws. Chain saws were measured at 107 dBA at a reference distance of 3.3 feet (1 meter) from the source (Root et al. 2013).

In accordance with the inverse square law, a calculation of the reduction in atmospheric sound level from the reference distance to the nearest noise sensitive receptors indicated that noise from chain saws would be attenuated to 67.8 dBA at the nearest residence along Route 3 (approximately 300 feet [91 meters]) (Figure 3-9). This noise level would slightly exceed the Guam Loudest Hourly Noise Standards identified for the exterior of residences (67 dBA, activity category B). However, it would generally be in line with the existing peak hour traffic noise measured along Route 3 in that location (68 dBA) (JGPO, 2010).

At Finegayan Elementary School, approximately 1,200 feet (366 meters) east of the nearest point of the Preferred Alternative project area (Figure 3-9), noise levels associated with the loudest training equipment (i.e., chain saws) are estimated at 55.7 dBA. This is below the Guam Loudest Hourly Noise Standards for the exterior of schools (67 dBA, activity category B).

Nighttime trainings would occur, but they would be infrequent (i.e., quarterly). The training events would typically be held early in the evening and would be completed no later than 9:00 p.m. to avoid potential noise impacts between 10:00 p.m. and 7:00 a.m.

3.5.4.2.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change are not likely to effect the noise environment. Predictable environmental trends associated with construction activity of RFFAs would generate noise, but none of the RFFAs are located in the direct vicinity of the Proposed Action, so additive impacts to nearby noise sensitive receptors are not expected.

3.5.4.3 Alternative 2 Impact Assessment

3.5.4.3.1 Construction-related Impacts

During project construction for Alternative 2, there would be short-term, temporary noise impacts to the noise environment in the vicinity of the project area (Figure 3-10). The greatest noise impacts would be to residential dwellings near Route 3 to the south of Potts Junction. A planning level assessment of construction noise impacts was conducted for Alternative 2 to estimate impacts to those residences. The dominant noise sources during construction would be from the operation of construction equipment, which would be conducted during normal daytime working hours.

For Alternative 2, the loudest construction equipment to be used would be a compactor, which has a measured maximum noise level (L_{max}) of 83 dBA at a reference distance of 50 feet (15 meters). In accordance with the inverse square law, there is an approximate 6 dBA decrease in sound level with every doubling of the reference distance. A calculation of the reduction in atmospheric sound level from reference distance to the nearest noise sensitive receptors indicated that noise from the compactor would be attenuated to 60.7 dBA at the nearest residence south of Potts Junction (approximately 600 feet [182 meters]) (Figure 3-10). This noise level is below the Guam Loudest Hourly Noise Standards identified for the exterior of residences (67 dBA, activity category B).

The Starts Golf Course is the other noise sensitive receptor in the vicinity of the Alternative 2 project area. It is located approximately 2,000 feet (610 meters) south of the nearest point of the Alternative 2 project area (Figure 3-10). At this distance the noise levels associated with the loudest construction equipment (i.e., compactors) are estimated at 50.5 dBA. This is below the Guam Loudest Hourly Noise Standards for the exterior of active sports areas (67 dBA, activity category B).

3.5.4.3.2 Operations-related Impacts

Operations related impacts associated with Alternative 2 would have insignificant noise impacts similar to the Preferred Alternative. For Alternative 2, the loudest training equipment likely to be used at the FFTF are chain saws, measured at 107 dBA at a reference distance of 3.3 feet (1 meter) from the source (Root et al. 2013). In accordance with the inverse square law, a calculation of the reduction in atmospheric sound level from reference distance to the nearest noise sensitive receptors indicated that noise from the chain saws would be attenuated to 61.1 dBA at the nearest residence south of Potts Junction (approximately 600 feet [182 meters]) (Figure 3-10). This noise level is below the Guam Loudest Hourly Noise Standards identified for the exterior of residences (67 dBA, activity category B).

The Starts Golf Course is located approximately 2,000 feet (610 meters) south of the nearest point of the Alternative 2 project area (Figure 3-10). At this distance the noise levels associated with the loudest construction equipment (i.e., compactors) are estimated at 50.9 dBA. This is below the Guam Loudest Hourly Noise Standards for the exterior of active sports areas (67 dBA, activity category B).

Additionally, Alternative 2 would maintain an existing vegetation buffer between the FFTF and Route 3 that would help to attenuate noise. Therefore, potential operational noise impacts from Alternative 2 would be less than from the Preferred Alternative.

3.5.4.3.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends additive impacts are expected to be the same as described for the Preferred Alternative.

3.6 Water Resources

This discussion of water resources includes groundwater, surface water, marine waters, wetlands, and floodplains.

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

MCB Camp Blaz overlies a portion of the Finegayan sub-basin of the Northern Guam Lens Aquifer (NGLA), an island karst aquifer located in uplifted young, highly conductive limestone that covers the northern half of Guam (Jocson et al., 2002). The NGLA has been designated by USEPA as a Sole Source Aquifer under the Safe Drinking Water Act. Overall, the groundwater quality within the NGLA is considered good, but the aquifer is susceptible to contamination from surface activities and from saltwater intrusion. The high permeability of the limestone in northern Guam allows rapid infiltration of rainfall and the large pore size in the limestone formations allows contaminants (if present in the surface water) to reach the groundwater table.

The 2015 Supplemental EIS for Guam and CNMI Military Relocation estimated that the Finegayan sub-basin had an available yield of 5.5 million gallons a day (MGd) and that operating MCB Camp Blaz will increase groundwater extraction by approximately 1.7 MGd. This will leave approximately 3.8 million MGd in available yield following the development of MCB Camp Blaz (JGPO, 2015).

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. There are no surface water resources in the MCB Camp Blaz area. Sinkholes and depressions in the porous limestone bedrock (karst) covering the northern portion of Guam, including MCB Camp Blaz channel surface runoff downward into the bedrock.

Wetlands are jointly defined by the U.S. Environmental Protection Agency (USEPA) and United States Army Corps of Engineers (USACE) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands

generally include “swamps, marshes, bogs and similar areas.” Surface water percolates downward into the bedrock in the MCB Camp Blaz area; therefore, the physical setting at MCB Camp Blaz does not support the formation of wetlands.

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. The entirety of MCB Camp Blaz is located within Flood Hazard Zone X, an area of minimal flood hazard (Federal Emergency Management Agency, 2007). There are no floodplains (100-year or 500-year) located within MCB Camp Blaz.

3.6.1 Regulatory Setting

The Safe Drinking Water Act is the federal law that protects public drinking water supplies throughout the nation. Under the Safe Drinking Water Act, The USEPA sets standards for drinking water quality. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.

Through the National Pollutant Discharge Elimination System (NPDES) program, the Clean Water Act (CWA) establishes federal limits on the amounts of specific pollutants that can be discharged into surface waters. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution.

The Guam NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan that is implemented during construction. As part of the 2010 Final Rule for the CWA, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Section 438 of the Energy Independence and Security Act establishes storm water design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 square feet (460 square meters) must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

3.6.2 Affected Environment

The ROI for water resources is the Finegayan sub-basin of the NGLA.

3.6.2.1 Existing Conditions

The following sections describe the existing conditions for water resources at MCB Camp Blaz.

3.6.2.1.1 Groundwater

MCB Camp Blaz overlies a portion of the Finegayan sub-basin of the NGLA, an island karst aquifer located in uplifted young, highly conductive limestone that covers the northern half of Guam (Jocson et al., 2002). The NGLA has been designated by USEPA as a Sole Source Aquifer under the Safe Drinking Water Act. Overall, the groundwater quality within the NGLA is considered good, but the aquifer is susceptible to contamination from surface activities and from saltwater intrusion. The high permeability

of the limestone in northern Guam allows rapid infiltration of rainfall and the large pore size in the limestone formations allows contaminants (if present in the surface water) to reach the groundwater table.

The 2015 Supplemental EIS for Guam and CNMI Military Relocation estimated that the Finegayan sub-basin had an available yield of 5.5 million gallons a day (MGd) and that operating MCB Camp Blaz would increase groundwater extraction by approximately 1.7 MGd. This would leave approximately 3.8 million MGd in available yield following the development of MCB Camp Blaz (JGPO, 2012).

3.6.2.1.2 Surface Water

There are no surface water resources in the MCB Camp Blaz area. Sinkholes and depressions in the porous limestone bedrock (karst) covering the northern portion of Guam, including MCB Camp Blaz channel surface runoff downward into the bedrock.

3.6.2.1.3 Wetlands

As described above in Section 3.6.2.1.2, surface water percolates downward into the bedrock in the MCB Camp Blaz area. The physical setting at MCB Camp Blaz does not support the formation of wetlands, thus, none are found at MCB Camp Blaz.

3.6.2.1.4 Floodplains

According to Flood Insurance Rate Map Panel 6600010025D, the entirety of MCB Camp Blaz is located within Flood Hazard Zone X, an area of minimal flood hazard (Federal Emergency Management Agency, 2007). There are no floodplains (100-year or 500-year) located within MCB Camp Blaz.

3.6.2.2 Predictable Environmental Trends

3.6.2.2.1 Predictable Trends Associated with Climate Change

Table 3-13 summarizes the predictable environmental trends for water resources associated with climate change.

Table 3-13 Predictable Environmental Trends for Water Resources Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	Primary implications of rising temperatures on water resources in the ROI are potential increases in evapotranspiration which could result in decreased groundwater recharge.
Change in precipitation patterns	According to the PIRCA report (2020), annual rainfall is expected to decrease 7% by 2100. This would have a negative impact on groundwater recharge in the NGLA.
Increased frequency and/or intensity of extreme weather events	Floods and extreme precipitation can increase contamination in freshwater sources.
Rising Sea Level and Associated Storm Surge	Rising sea levels could increase salinity in the NGLA, especially when compounded by decreasing recharge and increased groundwater pumping in the future.
Ocean acidification	No influence on resource.

Key: NGLA = Northern Guam Lens Aquifer; PIRCA = Pacific Islands Regional Climate Assessment; ROI = Region of Influence
Source: Grecni et al., 2020

3.6.2.2.2 Predictable Trends Associated with Reasonably Foreseeable Future Actions

Table 3-14 summarizes the predictable environmental trends for water resources associated with the applicable RFFAs described in Table 3-3.

Table 3-14 Predicatable Environmental Trends for Water Resources Associated with Reasonably Foreseeable Future Actions

Reasonably Foreseeable Future Action	*Geographic Overlap*	*Influence on Resource*
Infrastructure Upgrades AAFB, Guam	The project is located above the NGLA, but it is over a separate sub-basin	Increased impervious surfaces could impact groundwater quantity and quality, and increased water demand would have an additive effect on groundwater pumping from the NGLA.
ANG Beddown for SPCS #5 Basing Actions AAFB, Guam	The project is located above the NGLA, but it is over a separate sub-basin	Increased impervious surfaces could impact groundwater quantity and quality, and increased water demand would have an additive effect on groundwater extraction from the NGLA.
198 MW Ukudu Power Plant Dededo, Guam	The project is located above the NGLA, but it is over a separate sub-basin	Increased impervious surfaces could impact groundwater quantity and quality, and increased water demand would have an additive effect on groundwater pumping from the NGLA.
Defense of Guam EIAMD	Specific project locations have not yet been identified, but would likely include sites overlying the NGLA.	Increased impervious surfaces could impact groundwater quantity and quality, and increased water demand would have an additive effect on groundwater pumping from the NGLA.
Relocation of GNWR Facilities	The project is located above the Finegayan sub-basin of the NGLA, the same sub-basin as the Proposed Action.	Increased impervious surfaces could impact groundwater quantity and quality, and increased water demand would have an additive effect on groundwater pumping from the NGLA.

Key: AAFB = Andersen Air Force Base; ANG = Air National Guard; EIAMD = Enhanced Integrated Air and Missile Defense; GNWR = Guam National Wildlife Refuge; MW = megawatt; SPCS = Space Control Squadron; NGLA = Northern Guam Lens Aquifer

3.6.3 Environmental Consequences

This section discusses the potential short-and long-term effects to water resources that could result from implementation of the action alternatives and the no-action alternative. The effects analysis considers BMPs listed in Table 2-5. BMPs are measures that the Navy would implement to reduce the environmental impacts of designated activities, functions, or processes.

3.6.3.1.1 Nature and Type of Effects

Potential effects from the action alternatives would include those that result increased water demand (i.e., groundwater extraction), and potential impacts from stormwater quantity and quality on groundwater resources in the Finegayan sub-basin of the NGLA below MCB Camp Blaz.

3.6.3.1.2 Impact Assessment Methodology

For groundwater availability, the impact assessment methodology involved comparison of the Proposed Action's water usage with historic estimates for groundwater availability in the Finegayan sub-basin of the NGLA, as well as known increases in groundwater extraction that will occur with the development and operation of MCB Camp Blaz.

For stormwater, the impact assessment methodology involved a qualitative assessment of the potential increases to impervious surfaces associated with the implementation of the Proposed Action, as well as the implementation of BMPs to avoid/minimize impacts to stormwater quality and quantity.

3.6.3.2 No Action Alternative Impact Assessment

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

3.6.3.3 Alternative 1 (Preferred Alternative) Impact Assessment

3.6.3.3.1 Construction-related Impacts

During project construction for the Preferred Alternative, water trucks would be used for dust control during the dry season. Water from the trucks is estimated at 3,000 gallons (11,356 liters) per day, which represents a negligible impact on groundwater extraction at MCB Camp Blaz.

Construction activities under the Preferred Alternative would result in the removal of vegetation and soil disturbance, which could increase potential for short-term increases in stormwater runoff and erosion. Construction design specifications would reference the 2006 CNMI and Guam Stormwater Management Manual, and each vertical project would be required to implement a site-specific Stormwater Pollution Prevention Plan (SWPPP).

3.6.3.3.2 Operations-related Impacts

During the operational period, the FFTF would utilize water for training purposes, mainly extinguishing fires. Based on the anticipated training frequency for the FFTF and the number of planned props, annual water usage is estimated at 684,000 gallons. This equates to an average of approximately 0.002 MGd, which represents a negligible fraction (0.53%) of the estimated available yield (3.8 MGd) in the Finegayan sub-basin of the NGLA. Per the Guam Waterworks Authority, an average Guam household uses 60,000 gallons of water a year. Accordingly, the FFTF would use the equivalent annual water usage of approximately 11 additional homes. This level of withdrawal would not have an appreciable impact on groundwater availability or salinity in the Finegayan sub-basin of the NGLA. The 2015 SEIS describes how DoD will manage groundwater salinity levels in NGLA during MCB Camp Blaz operation.

Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system. Water usage at the FFTF would be subject to the periodic installation-wide review of intensity of water use to meet current and future sustainability and resilience initiatives.

The implementation of the Preferred Alternative would result in approximately eight acres (3.2 hectares) of new impervious surface at the project site. To minimize and avoid potential impacts from

this increase in impervious surface, the storm drainage system would be designed with Low Impact Design (LID) features to collect and filter runoff water, removing contaminants from the stormwater before it reaches the NGLA.

3.6.3.3.3 Predictable Environmental Trends Additive Impacts

The predictable environmental trends associated with climate change are expected to impact groundwater resources and the NGLA. Higher temperatures and reduced precipitation would decrease recharge rates, and rising sea levels could contribute to increased groundwater salinity. The implementation of the Preferred Alternative would contribute to this increased pressure on groundwater resources in the NGLA, but it represents a negligible fraction of the available yield in the Finegayan sub-basin of the NGLA. This means that there is significant capacity in the estimated available yield of the Finegayan sub-basin of the NGLA to support the FFTF without impacting water supply or water salinity for other water users in Guam.

3.6.3.4 Alternative 2 Impact Assessment

Construction impacts, operational impacts, and predictable environmental trends additive impacts are expected to be similar to those described for the Preferred Alternative. Alternative 2 would include the installation of approximately 0.3 acres (0.1 hectares) of additional impervious surface when compared to the Preferred Alternative. These additional impervious surfaces are associated with the Alternative 2 FFTF parking area and access road (0.3 acres [0.1 hectares]). Therefore, potential operations-related impacts from Alternative 2 would be greater than from the Preferred Alternative. Measures to avoid and minimize impacts from this increase in impervious surface would be the same as for the Preferred Alternative. These measures would include LID features to collect and filter runoff water, removing contaminants from the stormwater before it reaches the NGLA.

3.7 Air Quality and Greenhouse Gases

This section evaluates potential impacts to air quality, including the contribution of GHG emissions and climate change effects, that could result from implementation of the Proposed Action. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the local meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., gasoline- or diesel-fueled vehicles) and stationary sources (e.g., concrete batch plants, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and wildfires. Some pollutants are formed through atmospheric chemical reactions from other pollutant emissions (called precursors) that are influenced by weather, ultraviolet light, and other atmospheric processes. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere.

3.7.1 Regulatory Setting

3.7.1.1 National Standards

The USEPA has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare (Table 3-15) from six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$), and lead. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards are designed to protect public welfare, such as preventing damage to farm crops, vegetation, and buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects. States may also establish their own ambient air quality standards that are more stringent than those set by federal law (see Section 3.7.1.2). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public is exposed. Each ambient air quality standard (AAQS) has its own criteria, known as the "form" of the standard, related to if and how many times it may be exceeded before the AAQS is considered violated. The concentration that follows the form of the standard and that is used to compare with an AAQS is a design value. Pollutant concentrations at or near ground level are of particular interest because this is where most environmental impacts from air pollution occur.

Areas that are in compliance with the NAAQS are designated as attainment areas. Areas that do not meet the NAAQS for criteria pollutants are designated "nonattainment areas" for that pollutant and proposed actions within these areas are subject to additional requirements, such as general conformity.

USEPA has identified 188 hazardous air pollutants (HAPs), also referred to as toxic air pollutants or air toxics, that are known or suspected to cause cancer or other serious health and environmental effects. AAQS have not been established for HAPs because USEPA's strategy is to use reductions of HAP emissions from stationary industrial, mobile, and indoor sources as a means to providing nationwide health protections. National emission standards exist for HAPs, which are regulated under Section 112(b) of the 1990 CAA Amendments. The *National Emission Standards for Hazardous Air Pollutants* regulate HAP emissions from stationary sources (40 CFR part 61 and part 63).

The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

3.7.1.2 Guam Air Pollution Control Standards and Regulations

GEPA regulates air pollution in accordance with Guam Air Pollution Control Standards and Regulations. These regulations implement the actions required of Guam by the Federal Clean Air Act, including a permitting program, and laws enacted by the Guam Legislature. Title 22 of the Guam Administrative Rules, Chapter 1 §1302 provides details regarding ambient air pollution standards in consideration of public health, safety, and welfare and has implemented ambient air quality standards (see Table 3-15).

3.7.1.3 Greenhouse Gases and Climate Change

GHGs are gas emissions that trap heat in the atmosphere. These emissions arise from both natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide, methane, and nitrous oxide. GHGs are primarily produced by the

burning of fossil fuels and through industrial and biological processes. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

On January 9, 2023 CEQ issued interim guidance on greenhouse gas emissions and climate change under NEPA. Under NEPA, when addressing climate change, agencies should consider the potential effect of a proposed action on climate change as indicated by assessing GHG emissions and the effects of climate change on a proposed action and its environmental impacts. Pursuant to EO 2019-19, *Relative to Creating the Climate Change Resiliency Commission*, the Governor of Guam created the climate change resiliency commission to develop an integrated strategy to build resiliency against the adverse effects of climate change and to reduce contributing factors such as greenhouse emissions. The Commission will develop and coordinate an effective, data-based response to climate change focusing on key climate change outcomes including greenhouse emissions and carbon footprint.

USEPA issued the Final *Mandatory Reporting of Greenhouse Gases Rule* at 40 CFR Part 98 on September 22, 2009. GHGs covered under the Final *Mandatory Reporting of Greenhouse Gases Rule* are carbon dioxide (CO_2), methane, nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential (GWP). GWP is an index that incorporates both the direct effects of a gas on radiation—its "radiative efficiency"—as well as how long the gas persists in the atmosphere, or its "lifetime", and reflects the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs and reported as CO_2 equivalents or CO_2e. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as carbon dioxide equivalent (CO_2e) are required to submit annual reports to USEPA.

3.7.2 Affected Environment

The air quality ROI includes Northern Guam, where MCB Camp Blaz is located. The ROI for GHG emissions is inherently global; however, this analysis will provide the regional context of GHG emissions on Guam. Guam has a population of just over 170,000 people, the majority of whom are concentrated in urban areas. MCB Camp Blaz is located in the municipality of Dededo Village on northwest coast of Guam (Figure 1-1). Route 3 forms the eastern boundary of the installation. Sensitive receptors in the vicinity of MCB Camp Blaz include Finegayan Elementary School and residential housing areas located directly across Route 3 from the installation. For the Preferred Alternative, the nearest home is located 300 feet (91 meters) west of the project area, and Finegayan Elementary School is located approximately 1,200 feet (366 meters) west of the project area (Figure 3-12). For Alternative 2, the nearest residential home is located 600 feet (183 meters) south of the project area, and Finegayan Elementary School is located 1.7 miles (2.7 kilometers) south of the project area (Figure 3-13).

Meteorological conditions affect the dispersion and transport of air pollutants and the resulting air quality. Over the course of the year, the temperature typically varies from 76°F to 88°F and is rarely below 74°F The climate is tropical, hot and humid all year round, and chiefly influenced by east to northeasterly winds. Figure 3-11 depicts a wind rose for data collected from 2018 to 2022 by the weather station (PGUM) located at Antonio B. Won Pat International Airport (Figure 3-1). The wind rose

represents the directions around a compass, and the length of the petal or spoke indicates wind direction and frequency toward the center point. Individual segments of the spoke represent the frequency of winds for defined wind speed categories, with the slowest winds closest to and the fastest winds furthest from the center of the diagram. The average hourly wind speed in Guam has significant seasonal variation over the course of the year. The windier part of the year lasts for 6 months, from November to May, with average wind speeds of more than 13.8 miles per hour. The calmer season has an average hourly wind speed of 10.9 miles per hour (WeatherSpark, 2022).

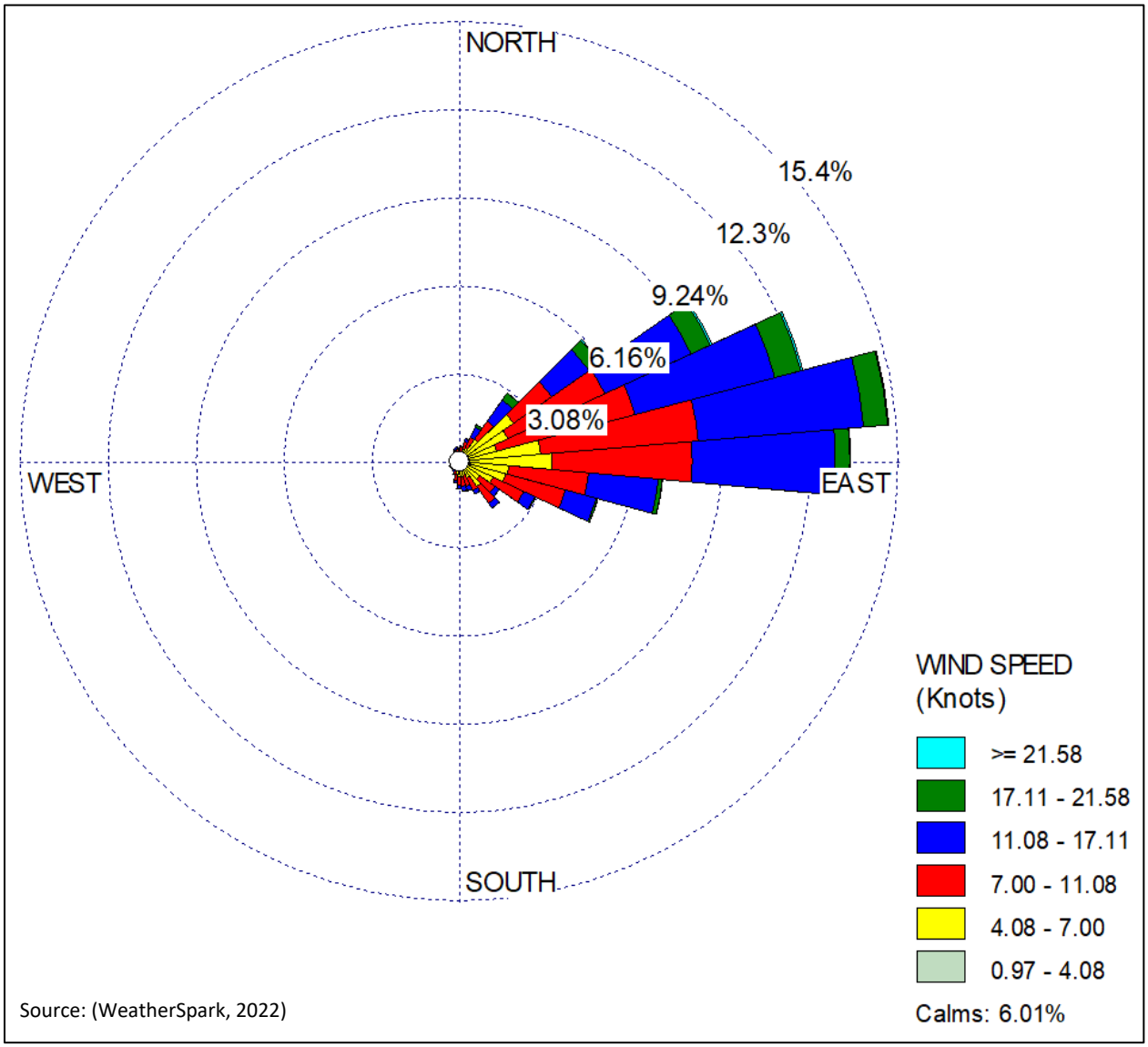


Figure 3-11 Wind Rose for Guam

Table 3-15 presents the national and Guam primary and secondary ambient air quality standards (AAQS) for criteria pollutants, along with their averaging times.

Table 3-15 National and Guam Ambient Air Quality Standards

Pollutant	*Averaging Time*	*Primary Standard*		*Secondary Standard*
		National	*Guam*	
CO	8-hour (1)	9 ppm (10 mg/m^3)	Same as Federal	None
	1-hour (1)	35 ppm (40 mg/m^3)	Same as Federal	None
Pb	Rolling 3-month Average (2)	0.15 µg/m^3 (3)	Same as Federal(13)	Same as Primary
NO_2	Annual (4)	53 ppb (5)	Same as Federal	Same as Primary
	1-hour (6)	100 ppb	None	None
PM_{10}	Annual	None	50 µg/m^3	Same as Primary
	24-hour (7)	150 µg/m^3	Same as Federal	Same as Primary
$PM_{2.5}$	Annual (8)	12 µg/m^3	None	15 µg/m^3
	24-hour (6)	35 µg/m^3	None	Same as Primary
O_3	8-hour (9)	0.07 ppm (10)	None	Same as Primary
	1-hour	None	235 µg/m^3 (0.12 ppm)	Same as Primary
SO_2	Annual mean	None	80 µg/m^3 (0.03 ppm)	None
	24-hour	None	365 µg/m^3 (0.14 ppm)	None
	3-hour (1)	None	None	0.5 ppm
	1-hour (11)	75 ppb (12)	None	None

Sources: USEPA 2023, Title 22 Guam Administrative Rules Chapter 1 Guam Air Pollution Control § 1302
Notes: Parenthetical values are approximate equivalent concentrations.
1. Not to be exceeded more than once per year.
2. Not to be exceeded.
3. Final rule signed October 15, 2008. The 1978 standard for Pb (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. The USEPA designated areas for the new 2008 standard on November 8, 2011.
4. Annual mean.
5. The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
6. 98th percentile, averaged over 3 years.
7. Not to be exceeded more than once per year on average over 3 years.
8. Annual mean, averaged over 3 years.
9. Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
10. Final rule signed March 12, 2008. The 1997 O_3 standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1- hour O_3 standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
11. 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
12. Final rule signed June 2, 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO_2 standards were revoked in that same rulemaking. These standards, however, remain in effect until 1 year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.
13. Maximum arithmetic mean averaged over a calendar quarter.
Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter.

3.7.2.1 Existing Conditions

Ambient air quality conditions around the northern Guam, where MCB Camp Blaz is located, are affected by a combination of on-base mobile sources including aircraft, aircraft ground support equipment, on-road and non-road vehicles, construction equipment, and existing power plants located in the area.

There are currently no air monitoring stations operating on Guam. Ambient air quality data has not been collected since 1991. There is currently no emissions inventory for the island of Guam, although the Guam Environmental Protection Agency (GEPA) is working towards producing an annual emissions inventory for the island.

Ambient air quality for other similarly situated islands in the Pacific Ocean, such as the Hawaiian island of Oahu where ambient air concentrations are measured for a higher population (population just over 1 million) and more industrial activities, supports the assessment that most areas of Guam have air quality that attains the AAQS. The portion of Guam where the Proposed Action would occur is designated attainment for all NAAQS. Similarly, based on ambient monitoring in Hawaii, existing concentrations of HAPs on Guam are expected to have a corresponding lifetime cancer risk less than 1 in a million and non-cancer hazard quotients below 1 (Navy, 2022).

3.7.2.2 Predictable Environmental Trends

3.7.2.2.1 Predictable Environmental Trends in Climate Change Resulting from Greenhouse Gas Emissions

Table 3-2 summarizes the predictable environmental trends from climate change resulting from GHG emissions. On Guam, the primary GHGs emitted are carbon dioxide (CO_2), methane, and nitrous oxide. These GHGs can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years. All of these gases remain in the atmosphere long enough to become well mixed, meaning that the amount that is measured in the atmosphere is roughly the same all over the world, regardless of the source of the emissions. The GWP allows comparison of the global warming impacts of different gases. Specifically, a GWP is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time. CO_2 has a GWP of 1 and serves as a baseline for other GWP values. CO_2 remains in the atmosphere for a very long time; changes in atmospheric CO_2 concentrations persist for thousands of years. The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period, which is most commonly defined as 100 years. Table 3-16 identifies the GWP of each of the three primary GHGs of concern. In addition to the GWPs, the data in Table 3-16 are the GHG emissions in Guam for the year 2021 reported to USEPA.

Table 3-16 2021 GHG Emissions in Guam, their Global Warming Potential, and Primary Sources for the Emissions

GHGs	*Guam Emissions (metric tpy CO_2e)*	*GWP*	*Primary Source of Emissions*
CO_2	586,241	1	Cabras Power Plant
CH_4	571	25	Cabras Power Plant
N_2O	1,359	298	Cabras Power Plant
Total CO_2e	588,171	—	—

Key: CH4 = methane; CO_2e = carbon dioxide equivalent; N2O = nitrous oxide; tpy = tons per year
Source: USEPA 2022 (ghgdata.epa.gov)

3.7.2.2.2 Predictable Trends Associated with Reasonably Foreseeable Future Actions

Table 3-17 summarizes the predictable environmental trends for air quality and GHGs associated with the applicable RFFAs described in Table 3-3.

Table 3-17 Predictable Environmental Trends for Air Quality and GHGs Associated with Reasonably Forseeable Future Actions

Reasonably Foreseeable Future Action	*Geographic Overlap*	*Temporal Overlap*	*Influence on Resource*
Infrastructure Upgrades AAFB, Guam	Within the ROI.	Construction would overlap with the Proposed Action.	Potential additive direct and indirect impacts on air quality and GHGs
ANG Beddown for SPCS #5 Basing Actions AAFB, Guam	Within the ROI.	Construction to be completed by 2024, so there is potential overlap with the construction of the Proposed Action.	Potential additive direct and indirect impacts on air quality and GHGs
198 MW Ukudu Power Plant Dededo, Guam	Within the ROI.	Construction to be completed by 2024, so there is potential overlap with the construction of the Proposed Action.	Potential additive direct and indirect impacts on air quality and GHGs
Defense of Guam EIAMD	Within the ROI.	Construction timing is still being refined, but it could overlap with the Proposed Action.	Potential additive direct and indirect impacts on air quality and GHGs
Relocation of GNWR Facilities	Within the ROI.	Construction to be completed by 2026, so there is potential overlap with the Construction of the Proposed Action.	Potential additive direct and indirect impacts on air quality and GHGs

Key: AAFB = Andersen Air Force Base; ANG = Air National Guard; EIAMD = Enhanced Integrated Air and Missile Defense; GNWR = Guam National Wildlife Refuge; MW = megawatt; ROI = Region of influence; RFFA = Reasonably Foreseeable Future Action; SPCS = Space Control Squadron

3.7.3 Environmental Consequences

This section discusses the potential short- and long-term effects to air quality that could result from implementation of the Proposed Action including the effect of the action's GHG emissions on climate change. Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives.

3.7.3.1 Nature and Types of Impacts

Air quality effects are changes to the environment resulting from project impacts that are reasonably foreseeable and have a reasonably close causal relationship to the action. These effects may include but are not limited to:

- Risks to populations resulting from the exposure to HAPs
- Changes in ambient concentrations for criteria pollutants and their effects on compliance with ambient air quality standards

The effect from GHGs emitted by the Proposed Action would be an incremental contribution to global climate change. The primary source of emissions from construction of the Proposed Action would be

from fuel-burning equipment and fugitive dust from ground disturbance. Impacts to air quality during the operational period would be associated with emissions from vehicles traveling to the training facility and completing training at the facility, as well as emissions from the burning of propane or wood/hay for live-firefighting training events.

3.7.3.2 Impact Assessment Methodology

The following assumptions were applied:

- Construction of the project would comply with GAR § 1304 such that visible fugitive dust plumes would not likely occur outside of the activity area.
- Elevated pollutant concentrations are expected immediately downwind of pollutant release; therefore, the analysis focuses on the area influenced by local wind patterns.

Other assumptions required for the air quality and GHG emissions calculations and analyses are provided in Appendix D.

To assess air quality impacts from emissions released as a result of the construction and subsequent operational activities, a qualitative analysis was performed. This analysis evaluated expected locations of pollutant plumes and receptors to determine if they overlap to inform on exposure potential and how the exposure compares to ambient air quality limits and threshold values. The receptor could be a human, animal, plant, building, or a place of interest. For addressing environmental justice per EO 12898, the receptors are areas where minority and indigenous peoples and people in low-income households reside. To address the protection of children under EO 13045, the receptors are locations where children are likely to be present. See Section 3.10 for analysis of impacts to environmental justice populations and children.

Construction duration and how changes in pollutant concentrations would affect design values are considered. For example, the 1-hour nitrogen dioxide NAAQS is based on a 3-year average, but if Proposed Action activities do not occur for the entire duration of the 3-year period, the period of no activity would lower the 3-year average. Therefore, the duration and intensity of pollutant exposure within the adjacent neighborhood of each localized activity area were considered in evaluating air quality impacts from the proposed temporary construction activities.

Emissions associated with construction of the FFTF were quantified to the extent possible based on activities described in Section 2.3 that would occur during an anticipated 24-month construction-related activity period.

The degree of effect in this analysis is correlated to duration of exposure. A short-term duration lasts from a few minutes to a day or days; for example, transient effects are of brief duration. A long-term duration would occur for a much longer period, on the order of months to years. A marginal effect is limited in extent. Intermittent effects are discontinuous or occasional.

The emissions calculations accounted for the direct and indirect emissions from the construction and operation of the Proposed Action, but emissions associated with the supply chain were not included (e.g., production of construction materials, etc.). Loss of carbon sequestration associated with the loss of trees or shrubs was also considered. Trees sequester (store) carbon as they grow, thereby removing CO_2 from the air. Removing trees, therefore, has the net effect of increasing CO_2 concentrations relative to what they would be if the trees were not removed. In addition, some studies have linked trees to the

reduction of nearby concentrations of air pollutants, such as NO_2 and particulate matter, which are linked to adverse health effects.

3.7.3.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline air quality. Air quality conditions in the project area would remain unchanged for both the short-term and long-term. MCB Camp Blaz Fire Department personnel would conduct their training under interim training measures at existing, non-compliant FFTFs at AAFB or throughout JRM. The No Action Alternative would not result in any direct or indirect air quality impact.

3.7.3.4 Alternative 1 (Preferred Alternative) Impact Assessment

3.7.3.4.1 Construction Related Impacts

Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion products from fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction to comply with Guam Air Pollution Control Standards and Regulations §1304. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked.

Construction of the Preferred Alternative is expected to begin in 2024 and continue for a 24-month period. Based on the anticipated construction phasing and activities for the Preferred Alternative, total emissions were estimated for each year of construction and are provided in Table 3-18. The data resources used for the air quality analysis and greenhouse gas emissions calculations are presented in Appendix D.

Table 3-18 Total Estimated Construction Period Emissions for the Preferred Alternative

Year	NO_X tpy	VOC tpy	CO tpy	PM_{10} tpy	$PM_{2.5}$ tpy	SO_2 tpy	$CO_2e^{(1)}$ tpy
2024	1.9	0.4	2.7	13	0.07	0.007	669.
2025	1.2	0.38	2.7	0.04	0.04	0.005	490
2026	1.0	0.2	1.7	0.4	0.05	0.003	270

Key: tpy = tons per year
Note: 1. Total GHG emissions in CO_2e

Construction emissions, released from the tailpipes of on-road and nonroad mobile sources are fugitive emissions and lack plume rise. Thus, air emissions are expected to initially disperse in the immediate vicinity of construction activities and then be transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time (Figure 3-12). Westerly winds could transport air emissions to public areas. However, westerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Northerly winds (to Machanao) and southerly winds (to MCB Camp Blaz) are infrequent and air pollutant concentrations are expected to be low as well.

Anticipated air quality impacts from the Preferred Alternative are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected.

GHG emissions generated from the Proposed Action alternatives contribute to the global atmosphere, regardless of the specific location within the ROI that they are produced. Construction of the Preferred Alternative would generate GHGs during the 24-month construction period. Total GHG emissions as a result of the 24-month construction activities are estimated to be approximately 1,430 tons of CO_2e (1,297 metric tons of CO_2e) or equivalent to 286 cars per year on the road as a typical passenger vehicle emits approximately 5 tons of CO_2 per year. The GHG emissions from the Preferred Alternative were compared to the data available on GHG emissions in Guam during 2021 (Table 3-16).

Climate change results from the incremental addition of GHG emissions from millions of individual sources. The quantitative analysis of CO_2e emissions is for illustrating the differences between the Preferred Alternative, Alternative 2, and the No Action Alternative emissions. The construction of the Preferred Alternative is estimated to result in 1,430 tons of CO_2e (1,297 metric tons of CO_2e) greater GHG emissions than the No Action Alternative (i.e., no construction), and 280 tons of CO_2e (254 metric tons of CO_2e) less GHG emissions than Alternative 2.

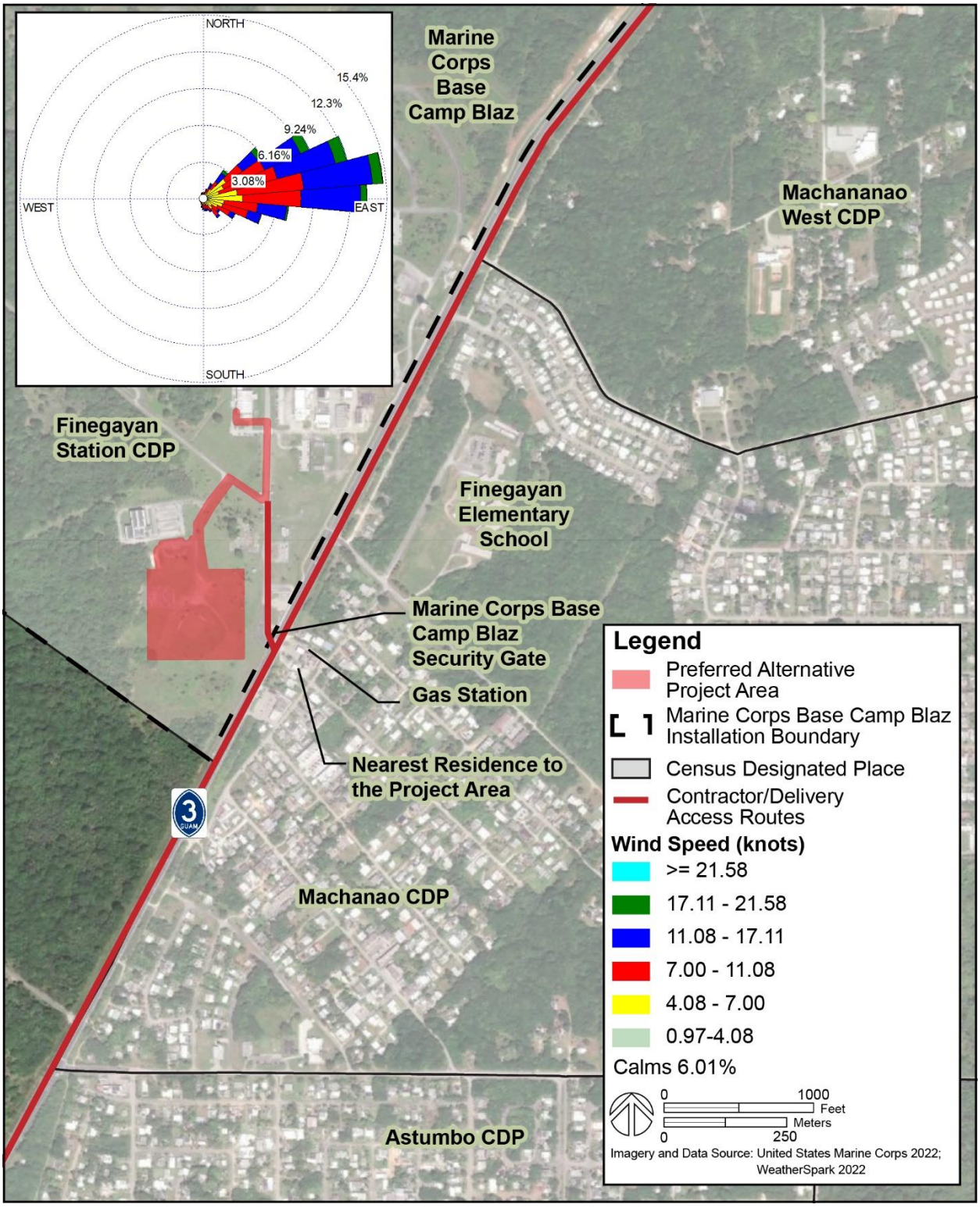


Figure 3-12 Preferred Alternative Project Area, Wind Rose, and Proximate Public/Sensitive Receptor Locations

3.7.3.4.2 Operations-related Impacts

Long-term impacts on air quality would occur from the operational activities associated with the Proposed Action. Under the Preferred Alternative, live-firefighting props utilizing propane, wood pallets and hay will be utilized during trainings. There will also be an increase in the number of truck trips once the FFTF is operational, and emergency vehicles will generate emissions while conducting training on the EVOC. Emissions released from the live-firefighting props are fugitive emissions with buoyant plume rise from the ground level. Emissions released from the tailpipes of on-road and nonroad mobile sources are fugitive emissions, and lack plume rise. Hence, air emissions are expected to initially disperse in the immediate vicinity of operational activities and then be transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time (Figure 3-12). Westerly winds could transport air emissions to public areas. However, westerly wind conditions are infrequent and air pollutant concentrations are expected to be low.

An air emissions analysis containing detailed calculations and assumptions was conducted for annual operational activities. The estimated annual operational period emissions are summarized in Table 3-19 and shown in detail in Appendix D.

Table 3-19 Total Estimated Annual Operational Period Emissions for the Preferred Alternative (Per Year)

Activities	NO_X tpy	VOC tpy	CO tpy	PM_{10} tpy	$PM_{2.5}$ tpy	SO_2 tpy	$CO_2e^{(1)}$ tpy	HAPs tpy
Live-firefighting Training	0.05	0.2	0.3	0.1	0.1	0.0002	98	0.01
Training Trucks	0.005	0.001	0.02	0.00009	0.00009	0.00002	3	--
Personal Vehicles	0.005	0.004	0.05	0.00008	0.00007	0.00004	6	--
Annual Total	0.06	0.2	0.3	0..1	0.1	0.0002	107	0.01

Key: tpy = tons per year

Note: 1. Total GHG emissions in CO_2e

Emissions released from the live-firefighting props are fugitive emissions with buoyant plume rise from the location of the fire and these smoke plumes are expected to rise into the atmosphere not far from where the plumes are created and not expected to impinge on surrounding areas for any extended period of time. Emissions released from the tailpipes of on-road and nonroad mobile sources are fugitive emissions and lack plume rise. Hence, air emissions are expected to initially disperse in the immediate vicinity of operational activities and then be transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time (Figure 3-12). Westerly winds could transport air emissions to public areas. However, westerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Northerly winds (to Machanao) and southerly winds (to MCB Camp Blaz) are infrequent and air pollutant concentrations are expected to low as well.

Anticipated air quality impacts from operational activities are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected.

Operation of the Preferred Alternative would generate GHGs, however GHG emissions from operations would be anticipated to remain close to existing operational levels due to the existing interim

firefighting training at existing, non-compliant FFTFs at AAFB or throughout JRM. Indirect CO_2 emissions from the electricity consumption for two proposed buildings are anticipated to be approximately 394 tons per year (358 metric tons per year).

The Preferred Alternative would require clearing of approximately 0.1 acres (0.04 hectares) of degraded limestone forest. The loss of carbon sequestration associated with vegetation clearing for the Preferred Alternative is estimated at 2.5 tons of CO_2 per year (2.3 metric tons of CO_2 per year). To mitigate the impacts of removing the trees and shrubs from the project site, the Navy plans to plant trees and shrubs as vegetative screening along the southwest fenceline of the proposed FFTF. Additionally, the Navy would operate the facility in accordance with Department of the Navy's Climate Action 2030.

Operational activities will comply with Guam Air Pollution Control Standards and Regulations, including obtaining all necessary permits required for burning liquid propane and other fuels used in training exercises.

3.7.3.4.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change are described in Section 3.7.2.2.1. Potential air quality impacts from RFFAs identified in Table 3-17 could result in additive impacts to air quality. Project-specific analysis of projects prior to construction would ensure that potential additive impacts of those projects and construction of the Preferred Alternative would not interfere with the attainment of AAQS or appreciably increase human health risks in areas with sensitive receptors and/or public presence.

3.7.3.5 Impact Assessment for Alternative 2

3.7.3.5.1 Construction Related Impacts

Alternative 2 would generate similar short-term temporarily-emitted air emissions during the construction period as the Preferred Alternative except that the amount of emissions would be slightly increased because of the vegetation clearing and longer utility connections associated with Alternative 2.

Short-term, temporarily-emitted air emissions (e.g., fugitive dust, combustion products from fossil fuels) would be generated during the construction period. BMPs would be implemented to minimize fugitive dust during construction to comply with Guam Air Pollution Control Standards and Regulations §1304. Example BMPs include watering of active work areas, using wind screens, keeping adjacent paved roads clean, covering of open-bodied trucks, limiting the area that is disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Construction emissions, released from the tailpipes of on-road and nonroad mobile sources are fugitive emissions, lack plume rise. Thus, air emissions are expected to initially disperse in the immediate vicinity of construction activities and then transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time (Figure 3-13). Westerly and northerly winds could transport air emissions to public areas. However, westerly and northerly wind conditions are infrequent and air pollutant concentrations are expected to be low.

Alternative 2 construction activities are expected to begin in 2024 and continue for a 24-month period. Based on the anticipated construction phasing and activities for Alternative 2, total emissions were

estimated for each year of construction and are provided in Table 3-20. The data resources used for air quality analysis and greenhouse gas emissions calculations are presented in Appendix D.

Table 3-20 Total Estimated Construction Period Emissions for Alternative 2

Year	NO_X tpy	VOC tpy	CO tpy	PM_{10} tpy	$PM_{2.5}$ tpy	SO_2 tpy	$CO_2e^{(1)}$ tpy
2024	2.8	0.5	3.9	20	0.1	0.01	952
2025	1.2	0.3	2.7	0.04	0.04	0.005	490
2026	1.0	0.2	1.7	0.4	0.05	0.003	270

Key: tpy = tons per year
Note: 1. Total GHG emissions in CO_2e

Construction emissions, released from the tailpipes of on-road and nonroad mobile sources are fugitive emissions and lack plume rise. Thus, air emissions are expected to initially disperse in the immediate vicinity of construction activities and are then transported downwind of release. Observations at the Guam International Airport indicate wind directions are mostly from the east, which would transport emissions away from public areas most of the time (Figure 3-13). Westerly and northerly winds could transport air emissions to public areas. However, westerly and northerly wind conditions are infrequent and air pollutant concentrations are expected to be low.

Anticipated air quality impacts from Alternative 2 are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected.

GHG emissions generated from the Proposed Action alternatives contribute to the global atmosphere, regardless of the specific location within the ROI that they are produced. Alternative 2 construction Activities would generate GHGs during the 24-month construction period. Total GHG emissions from construction activities are estimated to be approximately 1,710 tons of CO_2e (1,551 metric tons of CO_2e) or equivalent to 342 cars per year on the road. The GHG emissions from Alternative 2 were compared to the data available on GHG emissions in Guam during 2021 (Table 3-16).

While climate change results from the incremental addition of GHG emissions from millions of individual sources, the quantitative analysis of CO_2e emissions is for illustrating the differences between Alternative 2, the Preferred Alternative, and the No Action Alternative emissions. The construction of Alternative 2 is estimated to result in 1,710 tons of CO_2e (1,551 metric tons of CO_2e) greater GHG emissions than the No Action Alternative (i.e., no construction), and 280 tons of CO_2e (254 metric tons of CO_2e) greater GHG emissions than the Preferred Alternative.

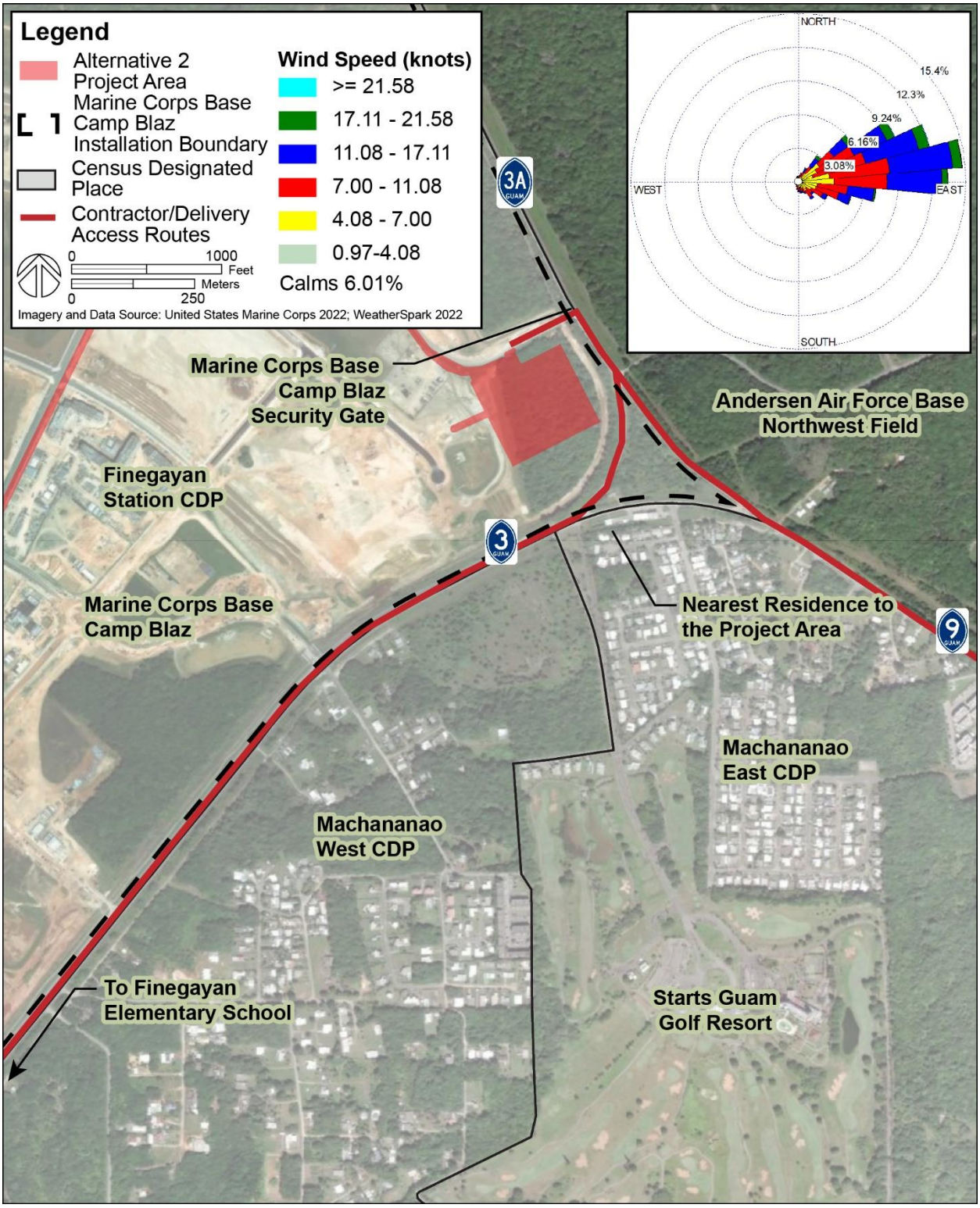


Figure 3-13 Alternative 2 Project Area, Wind Rose, and Proximate Public/Sensitive Receptor Locations

3.7.3.5.2 Operations-related Impacts

Operations-related criteria pollutants, GHG and HAP emissions and associated air quality impacts for Alternative 2 would be similar to that of the Preferred Alternative, except that Alternative 2 would require significantly more vegetation clearing than the Preferred Alternative. Therefore, there would be an additional loss of carbon sequestration during the operational period.

The loss of carbon sequestration associated with vegetation clearing for Alternative 2 is estimated at 162.5 tons of CO_2 per year (147.4 metric tons of CO_2 per year). This would be 160 tons of CO_2 per year (145.1 metric tons of CO_2 per year) greater than the Preferred Alternative. To mitigate the impacts of removing the trees and shrubs from the project site, Navy plans to plant trees and shrubs as vegetative screening along the southwest fenceline of the proposed FFTF. Additionally, the Navy would operate the facility in accordance with Department of the Navy's Climate Action 2030.

3.7.3.5.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends would be the same as described in Section 3.7.3.4.3.

3.8 Hazardous Materials and Hazardous Wastes

This section discusses hazardous materials, hazardous waste, toxic substances, and contaminated sites.

3.8.1 Regulatory Setting

Hazardous materials are defined by 49 CFR §171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal wastes regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, mercury containing equipment, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act (TSCA). Asbestos is also regulated by USEPA under the Clean Air Act, and the Comprehensive Environmental Response, Compensation, and Liability Act.

The Navy has implemented a strict Hazardous Material Control and Management Program and a Hazardous Waste Minimization Program for all activities. These programs are governed Navy-wide by applicable OPNAV instructions and at the installation by specific instructions issued by the Base Commander. The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes. Marine Corps Order (MCO) 5090.2 establishes Marine Corps policy and responsibilities for compliance with statutory and regulatory requirements for hazardous material and hazardous waste management and minimization.

3.8.2 Affected Environment

The ROI for hazardous materials and hazardous wastes includes the Preferred Alternative and Alternative 2 project areas where construction- and operations-related actions may occur.

3.8.2.1 Existing Conditions

Routine operations at DoD installations require the storage, use, and handling of a variety of hazardous materials. The Defense Logistics Agency Disposition Services (DLADS) through its contractors manages, stores, ships, and disposes of hazardous materials associated with all DoD installations and operations. DLADS maintains all hazardous materials documentation. Furthermore, DLADS contracts with licensed firms for proper disposal of these materials at permitted facilities.

The Preferred Alternative project location includes existing structures associated with the Andreen Softball Field. Due to the age of these structures, it is possible that they could contain special hazards including asbestos or lead based paint. There are no existing structures within the Alternative 2 project area, and therefore no special hazards are anticipated at that location.

3.8.2.2 Predictable Environmental Trends

3.8.2.2.1 Predictable Trends Associated with Climate Change

Table 3-21 summarizes the predictable environmental trends for hazardous materials and hazardous wastes associated with climate change.

Table 3-21 Predictable Environmental Trends for Hazardous Materials and Hazardous Wastes Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	• Increases in temperature could increase volatilization of persistent organic chemicals, thereby causing greater concentrations to become airborne and travel longer distances. • Increases in temperature and changes in air moisture content may alter the persistence of chemicals. • Rising air temperatures may cause land surfaces to retain less moisture, allowing contaminated soil to readily become airborne. • Pesticides could volatilize more readily, and residues may also readily degrade in warmer soil and surface waters. • Volatiles could dissipate more readily, thereby possibly decreasing volatile concentrations in the air and ocean.
Change in precipitation patterns	• Decreases in rainfall could lead to more frequent drought conditions allowing contaminated soil to readily become airborne.

Table 3-21 Predictable Environmental Trends for Hazardous Materials and Hazardous Wastes Associated with Climate Change

Predictable Trend	*Influence on Resource*
Increased frequency and/or intensity of extreme weather events	• Flooding events could remobilize chemicals that were absorbed into soil and sediment. • Flooding could dilute pollutants due to increased water volume in surface water bodies. • Extreme weather events could cause increased erosion by wind and surface water. The runoff of contaminated soils and solids into stormwater drains could lead to further contamination of the ocean. • Increased catastrophic weather events may result in increased accidental releases of chemicals. • Hurricanes and high winds could damage buildings and chemical storage facilities and supporting auxiliary structures (i.e., pipelines). • Alternating floods and droughts have been reported to cause arsenic release and contamination into groundwater. • Droughts may decrease the leaching of metals and contamination of groundwater.
Rising Sea Level and Associated Storm Surge	• No influence on resource due to location of project area over 100 feet (30 meters) above sea level.
Ocean acidification	• No influence on resource due to location of project area over 100 feet(30 meters) above sea level.

3.8.2.2.2 Predictable Trends Associated with Reasonably Foreseeable Future Actions

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on hazardous materials and hazardous wastes because none of the projects are located within the ROI.

3.8.3 Environmental Consequences

3.8.3.1 Nature and Type of Impacts

Effects due to hazardous materials and hazardous wastes could primarily result from petroleum, oil, and lubricants (POL) handling and transport for construction equipment (i.e., refueling, etc.) or potential release of special hazards (i.e., asbestos or lead-based paint) during facility demolition. The potential for adverse effects is expected to increase where these actions occur in areas of known contamination. Adverse impacts are expected to be avoided or reduced through BMPs (Table 2-5).

3.8.3.2 Impact Assessment Methodology

The hazardous materials assessment determined the extent to which action alternatives could release hazardous materials or interact with existing hazardous materials in a manner that could increase pathways to human or environmental exposure.

3.8.3.3 No Action Alternative Impact Assessment

Under the No Action Alternative, the Proposed Action would not occur and there would be no change associated with hazardous materials and wastes. Therefore, no impacts would occur with implementation of the No Action Alternative.

3.8.3.4 Alternative 1 (Preferred Alternative) Impact Assessment

3.8.3.4.1 Construction-related Impacts

Existing structures associated with the Andreen Softball Field could contain special hazards (i.e., asbestos or lead-based paint). Prior to demolition, these structures would be tested for the potential presence of these special hazards. Should they be detected, all applicable lead hazard controls and/or asbestos hazard controls would be implemented prior to demolition.

Construction contractors would be required to comply with all applicable rules/standards/regulations concerning handling of construction-related hazardous substances. Hazardous materials associated with construction activities would be delivered and stored in a manner that would prevent these materials from leaking, spilling, and potentially polluting soils, ground and surface waters and in accordance with applicable federal, state, and local regulations. Public transportation routes would be utilized for the conveyance of hazardous materials to the construction site. Transportation of all materials would be conducted in compliance with U.S. Department of Transportation regulations. Therefore, the short-term increase in the use, transport, storage and handling of hazardous materials during construction would have no significant direct or indirect impacts. There are no known contamination sites within the Preferred Alternative project area. However, should suspected environmental contamination be encountered during construction activities, work would stop and the appropriate authorities would be notified. If appropriate, soil and groundwater samples would be collected to determine the nature and the extent of the contamination and whether remedial action would be required.

3.8.3.4.2 Operations-related Impacts

Operations of the FFTF would include the storage of propane in an aboveground tank (approximately 10,000 gallons [37,854 liters]). This central propane tank will be piped to five of the eleven training props and the training tower via underground gas piping. In addition to the primary connection to the central propane tank, each of the propane-serviced props and tower will each be individually connected to smaller auxiliary propane tanks (up to six) for redundancy during maintenance of the central propane tank. The smaller auxiliary tanks will not exceed 10,000 gallons (37,854 liters) in total additional capacity. Propane is stored under pressure inside a tank as a liquid. As pressure is released, the liquid propane vaporizes and turns into gas. Propane storage tanks would be constructed and maintained in compliance with all applicable federal regulations and therefore no impacts to hazardous materials and hazardous wastes are expected.

Propane would be dispensed at the live-firefighting training props through certified burn pans. Some training exercises would utilize Class A materials (i.e., raw, untreated wood or hay) as fuel. Once the training fire is extinguished, any remaining ash or debris would be swept up and disposed of with regular solid wastes (i.e., dumpster).

To prevent or minimize water quality impacts, spill containment kits would be readily available onsite, vehicles would park on paved surfaces where possible, and place drip pans would be placed beneath parked vehicles when parked for extended periods of time. In the event of an accidental release of fuel, the Guam Environmental Protection Agency Spill Prevention Control Countermeasure Program would be implemented.

During training, water from the MCB Camp Blaz domestic water system would be used to extinguish the training fires. Operations of the FFTF would not involve the use of aqueous film forming foams (AFFF).

AFFF was previously used to extinguish fires, but it is now known to contain Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS). The Navy has released Interim Technical Guidance prohibiting the purchase and use of AFFF (Navy, 2022).

Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release; for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system. This would capture suspended chemicals in water used onsite and treat them before release into the sanitary sewer system.

3.8.3.4.3 Predictable Environmental Trends Additive Impacts

Climate change could increase the potential risks for release and transport of contaminants; however, the potential for additive impacts would be minimized or avoided through compliance with all applicable environmental regulations. The RFFAs are not located in the direct vicinity of the Preferred Alternative and are unlikely to result in additive impacts to hazardous materials and hazardous wastes.

3.8.3.5 Alternative 2 Impact Assessment

Construction related impacts are likely to be similar to the Preferred Alternative except that there are no known existing structures at the Alternative 2 project site, and therefore no special hazards (i.e., ACM, LBP and LCP) are likely to be encountered. Construction related impacts would have less than significant impacts on hazardous materials and hazardous wastes.

Operations related impacts are expected to be the same as described for the Preferred Alternative.

Predictable environmental trends additive impacts are expected to be the same as described for the Preferred Alternative.

3.9 Public Health and Safety

This section evaluates potential impacts to public health and safety that could result from implementation of the Proposed Action. Public health and safety within this EA discusses information pertaining to community emergency services, construction activities, operations, and environmental health and safety risks to children.

3.9.1 Regulatory Setting

The Marine Corps practices Operational Risk Management as outlined in Office of the Chief of Naval Operations (OPNAV) 3500.39A and Marine Corps Order (MCO) 3500.27A. The Guam Department of Public Health and Social Services ensures that construction and daily activities on Guam are conducted in accordance with applicable federal and Guam laws and regulations.

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

3.9.2 Affected Environment

The ROI for public health and safety analysis includes areas within the project area where construction and operations-related actions would occur, as well as adjacent communities of Guam within 0.5 miles of the project area boundary.

3.9.2.1 Existing Conditions

3.9.2.1.1 Installation Security

Guam Route 3 forms the eastern boundary of MCB Camp Blaz. Across Route 3 from the installation are several residential neighborhoods, commercial land uses, Finegayan Elementary School, and other civilian land uses. To protect public safety and ensure installation security, MCB Camp Blaz is surrounded by a perimeter security fence and protected by locked or manned gates. Additionally, signs have been posted to prohibit unauthorized personnel from entering the area.

3.9.2.1.2 Mutual Aid Agreements

MCB Camp Blaz has entered into a mutual aid agreement with the Naval Base Guam (NBG) fire department, AAFB fire department, and GovGuam fire department. This agreement allows these agencies to request mutual aid in the case of an emergency and allows the agencies to integrate training and other resources at no additional cost to each other. This agreement is an integral part of maintaining resilient and effective fire and emergency services on Guam.

3.9.2.1.3 Predictable Trends Associated with Climate Change

Table 3-22 summarizes the predictable environmental trends for public health and safety associated with climate change.

Table 3-22 Predictable Environmental Trends for Public Health and Safety Associated with Climate Change

Predictable Trend	*Influence on Resource*
Rising global temperatures (air/ocean)	Increased risk of health issues from extreme heat.
Change in precipitation patterns	Drought events threaten food security and access to drinking water. Drought can lead to an increase in wind-blown dust events which negatively affects air quality. Floods and extreme precipitation can contaminate freshwater sources, heighten the risk of water-borne disease, and create breeding grounds for disease-causing insects. These events can increase the risk of drowning, injury or illness, and property damage and disrupt medical and health services.
Increased frequency and/or intensity of extreme weather events	Floods and extreme precipitation can contaminate freshwater sources, heighten the risk of water-borne disease, and create breeding grounds for disease-causing insects. These events can increase the risk of drowning, injury or illness, and property damage and disrupt medical and health services. Increased frequency of intensity of typhoons could increase the potential for loss of life and property damage
Rising Sea Level and Associated Storm Surge	No influence on resource
Ocean acidification	No influence on resource

3.9.2.1.4 Predictable Trends Associated with RFFAs

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on public health and safety because none of the projects are located within the ROI.

3.9.3 Environmental Consequences

The public health and safety analysis addresses issues related to the health and well-being of civilians living near to MCB Camp Blaz. Specifically, this section provides information on hazards associated with construction and operation of the Proposed Action.

3.9.3.1 Nature and Type of Impacts

Potential effects to public health and safety from the Proposed Action alternatives would include impacts to air quality, increased traffic and potential for traffic accidents and potential for increased light pollution. There is a potential positive benefit due to construction of the Proposed Action in that local Guam fire services (mutual aid partners) would be able to use the facility for training purposes. This would be beneficial to the general public as the Proposed Action includes firefighting training facilities that do not currently exist on Guam, such as the six-story training tower.

The impact assessment methodology involved general literature searches and review of publicly available information from the Navy and the Territory of Guam.

3.9.3.2 No Action Alternative Impact Assessment

Under the No Action Alternative, the Proposed Action would not occur and there would be negative impacts to public health and safety. Without the construction of the Proposed Action, there would not be facilities for MCB Camp Blaz firefighters to train on which comply with Commander, Navy Installations Command (CNIC) regulations. MCB Camp Blaz firefighters would utilize interim training measures established for MCB Camp Blaz at non-compliant facilities. Additionally, mutual aid partners (i.e., NBG, AAFB, and GovGuam fire departments) would not have access to a multistory training facility to help prepare them for potential fires or other emergencies on other existing multistory buildings throughout the island of Guam. Therefore, implementation of the No Action Alternative would result in adverse impacts to public health and safety.

3.9.3.3 Alternative 1 (Preferred Alternative) Impact Assessment

3.9.3.3.1 Construction-related Impacts

Under the Preferred Alternative, construction activities and related short-term traffic increases to, from, and around the project area would pose the greatest hazard to public health and safety. Compliance with traffic control plans would minimize impacts and risks to pedestrians, bicyclists, and motorists during the construction period. The construction zone would be physically secured and monitored for unauthorized entry.

3.9.3.3.2 Operations-related Impacts

During operations there are unlikely to be any health and safety risks to the general public. Firefighting activities have inherent risk; however, the facility design and operation would closely follow standard operating procedures that would mitigate risk to the general public. Air quality risks are unlikely to impact the general public and further discussion can be found in section 3.7.

The Preferred Alternative would provide beneficial impacts for both MCB Camp Blaz and the wider Guam community through improved firefighter training facilities. Currently, there are no multistory firefighter training props on Guam. The Proposed Action includes a six-story training tower which would provide similar multistory training opportunities as the six-story BEQs on MCB Camp Blaz, and the

multistory hotel and apartment complex towers in Tumon and other areas of Guam. Mutual aid partners would be able to use the FFTF for training alongside MCB Camp Blaz firefighters.

3.9.3.3.3 Predictable Environmental Trends Additive Impacts

The predictable environmental trends associated with climate change could generate impacts to public health and safety, especially through the increased frequency and intensity of extreme weather events. The potential for more frequent and intense storms magnifies the need for properly trained and equipped emergency personnel. The Preferred Alternative would provide improved opportunities for both MCB Camp Blaz firefighters and emergency personnel from the mutual aid partners to conduct their required trainings. Therefore, the implementation of the Preferred Alternative would help to address potential future impacts associated with the predictable environmental trends.

3.9.3.4 Alternative 2 Impact Assessment

Construction impacts, operational impacts, and predictable environmental trends additive impacts are expected to be the same as described for the Preferred Alternative.

3.10 Environmental Justice

USEPA defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (USEPA 2014).

3.10.1 Regulatory Setting

Consistent with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations.

3.10.2 Affected Environment

The affected environment for environmental justice is defined using demographic data that identifies low-income populations, minority, and Chamorro populations, relative to the location of the Preferred Alternative and Alternative 2 project areas. The area that makes up the ROI consists of census designated place (CDP) where project activities would occur as well as adjacent CDPs (Figure 3-14). Most of MCB Camp Blaz is located within the Finegayan Station CDP, however, no data are available for this CDP. Therefore, this analysis focuses on the CDPs adjacent to MCB Camp Blaz, including Machananao East, Machananao West, and Machanao.

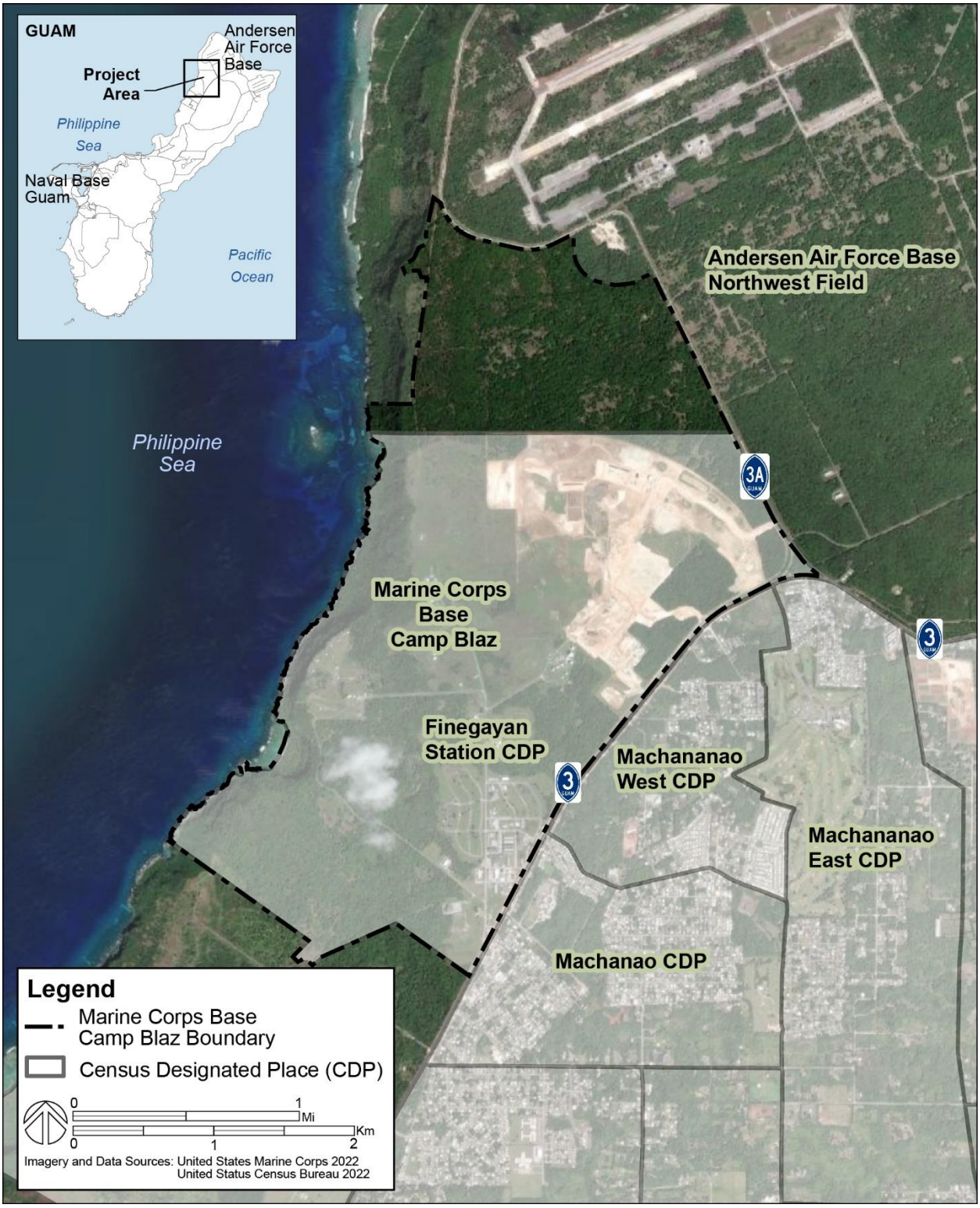


Figure 3-14 Census Designated Places in the Vicinity of MCB Camp Blaz

3.10.2.1 Existing Conditions

This section identifies concentrations of low-income and minority populations that have the potential to be disproportionately impacted due to their proximity to project activities. Baseline exposure levels of potential impacts are established in the respective resource sections of this EA.

3.10.2.1.1 Low-income Populations

Low-income populations were identified using methods described by the Environmental Justice Interagency Working Group and NEPA Committee (Environmental Justice Interagency Working Group 2016) and guidelines issued by the CEQ (1997). Using the low-income threshold criteria analysis outlined by the working group, a CDP is considered to be a low-income area if the percentage of households with incomes below the poverty line is greater than the reference area. For this analysis, the reference area is the island of Guam. Table 3-23 shows the percentage of households with incomes below the poverty line in each CDP adjacent to the Preferred Alternative and Alternative 2 project areas. All three CDPs in the ROI have a greater percentage of families below the poverty line than the island of Guam as a whole. Therefore, they can all be considered to be environmental justice low-income areas.

Table 3-23 Families in the ROI with Incomes Below the Poverty Level

Reference Area/ Census Designated Place	*Total Number of Families*	*Total Percent of Families Below the Poverty Line*	*Environmental Justice Low-Income Area?*
Reference Area			
Guam	33,893	16.8%	N/A
Census Designated Places			
Finegayan Station	No data available		
Machananao East	756	24.6%	Yes
Machananao West	667	27.0%	Yes
Machanao	1283	18.0%	Yes

Source: 2020 Island Areas Censuses: Guam (U.S. Census Bureau 2020)

3.10.2.1.2 Minority and Chamorro Populations

According to the Environmental Justice Interagency Working Group and NEPA Committee (Environmental Justice Interagency Working Group, 2016) and guidelines issued by the CEQ (1997), a CDP may be considered to be a minority area if 50 percent or more of its population is American Indian or Alaskan Native, Asian or Pacific Islander, Black, or Hispanic, or if the percentage of the minority population is meaningfully greater than the minority population percentage in the general population or reference area. For this analysis the reference area is the island of Guam. Table 3-24 shows the population breakdown for minority and Chamorro populations for each CDP adjacent to the Preferred Alternative and Alternative 2 project area, as well as the reference area (i.e., Guam). All three of the CDPs were found to have a higher proportion of minority populations than the island of Guam as a whole. Therefore, they can all be considered environmental justice minority areas.

The environmental justice analysis also evaluates the potential impacts on the Chamorro population. In this analysis, the CDPs in the ROI were compared to the reference area (i.e., Guam) to determine if the CDPs include a disproportionate concentration of Chamorro residents. The percentage of the population that identifies as Chamorro in the CDPs is significantly less than that of the island of Guam as a whole. Therefore, none of the CDPs in the ROI were found to have a high concentration of Chamorro residents.

Table 3-24 Minority and Chamorro Population in the ROI

Reference Area/ Census Designated Place	*Total Population*	*Total Percent Minority*	*Environmental Justice Minority Area?*	*Total Percent Chamorro*	*High Concentration of Chamorro Residents*
Reference Area					
Guam	153,836	93.2%	N/A	32.8%	N/A
Census Designated Places					
Finegayan Station	No data available				
Machananao East	3,643	98.3%	Yes	13.5%	No
Machananao West	3,246	97.8%	Yes	21.4%	No
Machanao	5,809	99.0%	Yes	11.5%	No

Source: 2020 Island Areas Censuses: Guam (U.S. Census Bureau 2020)

3.10.2.2 Predictable Environmental Trends

3.10.2.2.1 Predictable Trends Associated with Climate Change

Table 3-25 summarizes the predictable environmental trends for environmental justice associated with climate change.

Table 3-25 Predictable Environmental Trends for Environmental Justice Associated with Climate Change

Predictable Trend	*Influence on Resources*
Rising global temperatures (air/ocean)	Low-income populations may be disproportionately impacted by rising global temperatures because they may have a greater sensitivity to impacts and lack the resources to mitigate impacts or help them adapt to changing environments.
Change in precipitation patterns	Low-income populations may be disproportionately impacted by changes in precipitation patterns because they may have a greater sensitivity to impacts and lack the resources to mitigate impacts or help them adapt to changing environments.
Increased frequency and/or intensity of extreme weather events	Low-income populations may be disproportionately impacted by the increased frequency and/or intensity of extreme weather events because they may have a greater sensitivity to impacts and lack the resources to mitigate impacts or help them adapt to changing environments.
Rising sea levels and associated storm surge	Low-income populations may be disproportionately impacted by rising sea levels and associated storm surge because they may have a greater sensitivity to impacts and lack the resources to mitigate impacts or help them adapt to changing environments.
Ocean acidification	Low-income and indigenous populations may be disproportionately impacted by ocean acidification if certain species that are important to cultural practice or subsistence are impacted.

3.10.2.2.2 Predictable Trends Associated with Reasonably Foreseeable Future Actions

The predictable environmental trends associated with RFFAs described in Table 3-3 are not expected to have any influence on environmental justice communities because none of the projects are located within the ROI.

3.10.3 Environmental Consequences

This analysis focuses on the potential for a disproportionate and adverse exposure of specific off-base population groups to the projected adverse consequences discussed in the previous sections of this chapter.

3.10.3.1.1 Nature and Type of Effects

Low-income and minority populations have the potential to be disproportionately impacted by construction and operational activities that could increase noise and/or air pollution, deteriorate visual landscapes, and disturb cultural sites. Construction and operational activities would be considered a disproportionate impact if those activities affect areas that were identified as having higher concentrations of low-income or minority populations and the effects were significant.

3.10.3.1.2 Impact Assessment Methodology

The environmental justice analysis uses the descriptions of impacts presented in the respective EA resource sections to determine if those impacts would result in disproportionately high and adverse impacts on low-income or minority populations in the ROI. To make these determinations, the CEQ (1997) recommends each resource area that has the potential to adversely affect minority or low-income populations be analysed, recognizing "the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed agency action."

3.10.3.2 No Action Alternative Impact Assessment

Under the No Action Alternative, the Proposed Action would not occur and there would be no effect to environmental justice communities. Therefore, no impacts would occur with the implementation of the No Action Alternative.

3.10.3.3 Alternative 1 (Preferred Alternative) Impact Assessment

The Machanao CDP is located directly across Route 3 from the Preferred Alternative project area, and it is considered to be both a minority and a low-income environmental justice area.

3.10.3.3.1 Construction-related Impacts

Construction related impacts would include short-term temporary increases in noise and air emissions associated with the construction process. Construction noise would be minimized through the implementation of BMPs identified in Table 2-5, and noise levels at the nearest noise sensitive receptors in the Machanao CDP (i.e., private residences fronting Route 3) would be similar to existing noise generated from vehicle traffic on Route 3. Air emissions would also be minimized through the implementation of BMPs and the prevailing easterly wind direction would typically carry air emissions to the west, away from the Machanao CDP. Westerly winds could transport air emissions to public areas. However, westerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Therefore, construction period impacts would not represent a disproportionate impact on the Machanao CDP.

3.10.3.3.2 Operations-related Impacts

Once constructed, the Preferred Alternative FFTF would be visible from the Route 3 frontage along the Machanao CDP. However, these newly introduced visual elements would not appreciably degrade visual resources and would be consistent with the nature and type of development in the southern portion of MCB Camp Blaz (i.e., the former NCTS) visible from Route 3. The Preferred Alternative would include vegetative screening along the FFTF security fence facing Route 3. Therefore, most of the low-lying visual elements of the FFTF would be screened from view. The FFTF would also include nighttime security lighting. However, the lighting would be shielded and downward facing, and would have negligible impacts outside the project area. Operations of the Preferred Alternative FFTF would include noise emissions associated with the training activities, but the noise levels at the nearest noise sensitive receptors in the Machanao CDP (i.e., private residences fronting Route 3) would be similar to existing noise generated from vehicle traffic on Route 3. Additionally, the noise would only occur during the active portions of training sessions, typically during daytime hours. Operational air emissions would be generated from vehicle access and training, as well as the burning of propane and Class A fuels (wood or hay) during training events. These impacts are expected to be negligible as the prevailing easterly wind direction would typically carry operational period air emissions to the west, away from the Machanao CDP. Westerly winds could transport air emissions to public areas. However, westerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Therefore, operations-related impacts would not represent a disproportionate impact on the Machanao CDP.

3.10.3.3.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends associated with climate change and the RFFAs could result in disproportionate impacts to low-income communities, including Machanao CDP. However, the potential impacts associated with the Preferred Alternative are not expected to exacerbate those impacts. Construction period impacts would be short-term and temporary in nature, and they would be minimized through the use of BMPs. The long-term, the operations of the FFTF would comply with all applicable laws and regulations. Therefore, the implementation of Preferred Alternative is not expected to generate significant additive impacts to the predictable environmental trends.

3.10.3.4 Alternative 2 Impact Assessment

The Machananao East and Machananao West CDPs are located directly across Route 3 from the Alternative 2 project area, and both are considered to be minority and low-income environmental justice areas.

3.10.3.4.1 Construction-related Impacts

Construction related impacts would include short-term temporary increases in noise and air emissions associated with the construction process. Construction noise would be minimized through the implementation of BMPs identified in Table 2-5, and noise levels at the nearest noise sensitive receptors would be well within applicable standards. Air emissions would also be minimized through the implementation of BMPs and the prevailing easterly wind direction would typically carry air emissions to the west, away from the residential areas. Westerly and northerly winds could transport air emissions to public areas. However, westerly and northerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Therefore, construction period impacts would not represent a disproportionate impact on the Machananao East and Machananao West CDPs.

3.10.3.4.2 Operations-related Impacts

Once constructed, the Preferred Alternative FFTF would be visible from the Route 3 frontage along the Machananao West CDP; however, there would be a remaining forested buffer that would help to obstruct views into the site so the overall visual impacts would be minimal. Additionally, Alternative 2 would include vegetative screening along the FFTF security fence facing Route 3. Therefore, most of the low-lying visual elements of the FFTF would be screened from view. Noise generated during operations would be the same as under the Preferred Alternative but would more attenuated than under the Preferred Alternative due to the existing vegetative buffer between Alternative 2 and Route 3. Operational air emissions would be generated from vehicle access and training, as well as the burning of propane and Class A fuels (wood or hay) during training events. These impacts are expected to be negligible as the prevailing easterly wind direction would typically carry operational period air emissions to the west, away from the Machananao East and Machananao West CDPs. Westerly and northerly winds could transport air emissions to public areas. However, westerly and northerly wind conditions are infrequent and air pollutant concentrations are expected to be low. Therefore, operations-related impacts would not represent a disproportionate impact on the Machananao East and Machananao West CDPs.

3.10.3.4.3 Predictable Environmental Trends Additive Impacts

Predictable environmental trends additive impacts are expected to be the same as described for the Preferred Alternative.

3.11 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative is provided in Table 3-26.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Visual Resources	No impact	Less than significant impacts Vertical elements of the Preferred Alternative would be visible from Route 3. The six-story training tower, and to a lesser extent, the two-story observation/control facility and security fence line would be noticeable to pedestrians, motorists and residents along Route 3. The six-story training tower would be similar in scale to the elevated NCTS water tanks along Route 3, and the two-story observation/control facility would be of a similar scale to other existing buildings in the area. These newly introduced visual elements would not appreciably degrade visual resources and would be consistent with the character and type of development in the southern portion of MCB Camp Blaz (i.e., the former NCTS) visible from Route 3.	Less than significant impacts Alternative 2 would be partially visible from Route 3. Since the Alternative 2 project area is currently forested, the development of the FFTF and the six-story training tower would generate a moderate visual contrast to the surrounding forested areas. However, the lands directly east of the project area have already been cleared for MCB Camp Blaz. The remaining forested area would help to screen views into the site from Route 3A and portions of Route 3. Thus, the overall visual impacts would be minimal.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Cultural Resources	No impact	No significant impacts The Navy does not expect to encounter cultural resources in the Preferred Alternative area of potential effect (APE). Geospatial analysis concluded that the entirety of this area was graded to bedrock due to mid-20th century military construction. Cultural artifacts, recovered from disturbed contexts during grubbing and clearing for MCB Camp Blaz, are currently located in a temporary storage location within the APE. These artifacts will be relocated to a publicly accessible location at the MCB Camp Blaz main gate. These artifacts will be installed with informational signage and other necessary interpretive features with language consulted upon with the Guam SHPO per Part VIIb.1 of the 2011 Guam PA. As is required under the 2011 Guam PA, the Navy prepared a PA memo documenting its proposed finding of No Historic Properties Affected for the Preferred Alternative. The memo was submitted to the Guam SHPO on March 27, 2023.	Less than significant impacts Site 66-08-2305, a former Seabee encampment, is located within the Alternative 2 project area. This site was partially removed by the construction of Marine Corps Base Camp Blaz (Project J-001B). At that time, the Navy completed data recovery for the entire site to mitigate adverse effects. Construction of Alternative 2 would result in further impacts to Site 66-08-2305, including the removal of Features 2 (former fuel pipeline), 3a (refuse dump), and 4 (naval artillery round crater). These features appear to have been undisturbed by Project J-001B. Prior to implementation, the Navy would initiate consultation with the Guam SHPO under the 2011 PA to mitigate potential adverse effects from Alternative 2. Since data recovery was already completed for the entire site under Project J001-B, no further data recovery would be necessary. Additional mitigation measures would likely include performing archaeological monitoring consistent with the 2018 Dispute Resolution agreement between JRM and the Guam SHPO.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Terrestrial Biological Resources	No impact	Less than significant impacts The Preferred Alternative would be located primarily on previously developed land, but it would include clearing of approximately 0.1 acres (0.04 hectares) of degraded limestone forest. Potential effects on migratory birds and the Mariana fruit bat would be minimized by implementing BMPs including pre-construction surveys and shielded lighting. Potential effects on the Mariana fruit bat would be minimized by implementing avoidance and minimization measures. In accordance with Section 7 of the ESA, the Navy conducted formal consultation with the USFWS. The Navy determined the project is likely to adversely affect the Mariana fruit bat (Appendix B).	Less than significant impacts Alternative 2 would be located in an existing forested area and would require clearing of 0.5 acres (0.2 hectares) of *Spathodea* forest, and 7.2 acres (2.9 hectares) of *Vitex* forest. There are nine high value trees (*Elaeocarpus joga*) within the footprint that would be removed. One federal special status species was identified within the Alternative 2 footprint during surveys in 2015: five *Tuberolabium guamense* orchids growing on non-native *Vitex parviflora* trees. Healthy *Tuberolabium guamense* individuals would be transplanted into protected areas where feasible. Potential effects on migratory birds and the Mariana fruit bat would be minimized by implementing the same BMPs as for the Preferred Alternative.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Noise	No impact	Less than significant impacts Construction would result in short-term increases in daytime noise. The estimated construction noise levels for the nearest residences along Route 3 would be similar to existing noise levels from vehicle traffic on Route 3. The estimated construction noise levels at Finegayan Elementary School would be below Guam Department of Public Works Standards for schools. Noise associated with operation of the facility is anticipated to have a negligible effect on the noise environment.	Less than significant impacts Construction would result in short-term increases in daytime noise. The estimated construction noise levels for the nearest residences along Route 3 and the Starts Guam Golf Resort would be below Guam Department of Public Works Standards for residences and active sports facilities. Noise associated with operation of the facility is anticipated to have a negligible effect on the noise environment.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Water Resources	No impact	Less than significant impacts Water usage during the construction and operational period would be negligible when compared with the overall MCB Camp Blaz demand for water and would be well within the estimated available yield for the Finegayan sub-basin of the Northern Guam Lens Aquifer. The new facilities would be designed based on the principles of LID and would not increase stormwater runoff from the project site into adjacent areas. Erosion control BMPs would be implemented during construction in compliance with applicable permits. Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system.	Less than significant impacts Water usage during the construction and operational period would be negligible when compared with the overall MCB Camp Blaz demand for water and would be well within the estimated available yield for the Finegayan sub-basin of the Northern Guam Lens Aquifer. The new facilities would be designed based on the principles of LID and would not increase stormwater runoff from the project site into adjacent areas. Erosion control BMPs would be implemented during construction in compliance with applicable permits. Wastewater from training activities (i.e., water used to extinguish training fires) would be appropriately managed prior to release, for example, using an equalization tank system to collect, treat, and pump the wastewater to the sanitary sewer system.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Air Quality and Greenhouse Gases	No impact	Less than significant impacts Air emissions would be generated during both the construction and operational period (e.g., fugitive dust, combustion of fossil fuels for equipment, burning of fuels for live-firefighting trainings, etc.). Anticipated air quality impacts are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. GHG emissions would have a negligible effect on Guam's overall contribution to GHG emissions.	Less than significant impacts Air emissions would be generated during both the construction and operational period (e.g., fugitive dust, combustion of fossil fuels for equipment, burning of fuels for live-firefighting trainings, etc.). Anticipated air quality impacts are not expected to interfere with the attainment of AAQS or appreciably increase human health risks from HAP exposure in areas where sensitive receptors and/or public presence are expected. GHG emissions would be greater than for the Preferred Alternative, but would still have a negligible effect on Guam's overall contribution to GHG emissions.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Hazardous Materials and Hazardous Wastes	No impact	Less than significant impacts Existing structures associated with the Andreen Softball Field could contain special hazards (i.e., asbestos or lead-based paint). Operations of the FFTF would include the storage of propane in an aboveground tank. This storage tank would be constructed and maintained in compliance with all applicable federal regulations. Propane would be connected to the live-firefighting props via underground gas piping and dispensed through certified burn pans. Some training exercises would utilize Class A materials (i.e., raw, untreated wood or hay) as fuel. Once the training fire is extinguished, any remaining ash or debris would be swept up and disposed of with regular solid wastes (i.e., dumpster). Operations of the FFTF would not involve the use of aqueous film forming foams (AFFF). AFFF was previously used to extinguish fires, but it is now known to contain Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS). The Navy has released Interim Technical Guidance prohibiting the purchase and use of AFFF (Navy, 2022).	Less than significant impacts Construction related impacts are likely to be similar to the Preferred Alternative except that there are no known existing structures at the Alternative 2 project site, and therefore no special hazards (i.e., ACM, LBP and LCP) are likely to be encountered. Operation of the FFTF would be the same as for the Preferred Alternative.

Table 3-26 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1 (Preferred Alternative)*	*Alternative 2*
Public Health and Safety	Adverse Impacts Under the No Action Alternative, the proposed FFTF would not be constructed. MCB Camp Blaz Fire Department personnel would be required to conduct their training under interim training measures at existing, non-compliant FFTFs at AAFB or NBG. Additionally, mutual aid partners (i.e., NBG, AAFB, and GovGuam fire departments) would not have access to a multistory training facility to help prepare them for potential fires or other emergencies on multistory buildings throughout the island of Guam.	Beneficial impacts The Preferred Alternative will provide beneficial impacts for MCB Camp Blaz and the larger Guam community through improved firefighter training facilities. Currently, there are no NFPA-compliant multistory firefighter training props on Guam. The Proposed Action includes a six-story training tower which will provide similar compatible training environments to the six-story BEQs on MCB Camp Blaz and other multistory buildings on Guam. Mutual aid partners will be invited to use the FFTF for training alongside MCB Camp Blaz firefighters.	Beneficial impacts Alternative 2 will provide the same beneficial impacts as the Preferred Alternative.
Environmental Justice	No Impact	Less than significant impacts The Preferred Alternative would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.	Less than significant impacts Alternative 2 would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Key: AAFB = Andersen Air Force Base; AAQ = Ambient Air Quality; APE = Area of Potential Effect; BEQ = Bachelor Enlisted Quarter; BMP = Best Management Practice; BO = Biological Opinion; CNIC = Commander, Navy Installations Command; ESA = Endangered Species Act; FFTF = Firefighter Training Facility; HAP = Hazardous Air Pollutants; LID = Low Impact Development; GovGuam = Government of Guam; MBTA = Migratory Bird Treaty Act; MCB = Marine Corps Base; NBG = Naval Base Guam; NCTS = Naval Computer and Telecommunications Station; NFPA = National Fire Protection Agency; NRHP = National Register of Historic Places; NHPA = National Historic Preservation Act; PA = Programmatic Agreement; USFWS = United States Fish and Wildlife Service

1

4 Mitigation Measures

The National Environmental Protection Act requires federal agencies to consider appropriate mitigation measures to avoid, minimize, and/or compensate for specific impacts (Council on Environmental Quality 2011). This chapter describes actions the Navy is taking to avoid and minimize impacts from the Proposed Action and identifies potential mitigation measures for consideration to further minimize or offset remaining adverse environmental impacts from the Proposed Action analyzed in this Environmental Assessment.

4.1 Avoidance and Minimization Incorporated into the Proposed Action

4.1.1 Best Management Practices

The Navy would implement best management practices (BMPs) to avoid and minimize adverse impacts from the Proposed Action. BMPs included in the Proposed Action are listed in Chapter 2, Table 2-5. These BMPs are inherent parts of the Proposed Action and action alternatives and are discussed in the impact analysis sections of Chapter 3.

4.1.2 Other Avoidance, Minimization, and Mitigation Measures

Other measures to avoid and/or minimize environmental impacts associated with the Proposed Action beyond BMPs are summarized in Table 4-1.

Table 4-1 Impact Avoidance And Minimization Measures

Applicable Alternative	*Measure*	*Anticipated Benefit / Evaluating Effectiveness*	*Estimated Completion Date*
Preferred Alternative and Alternative 2	Plant vegetation screening along the FFTF perimeter fence facing Route 3.	Minimize impacts to visual resources	Planting to be completed during construction
Preferred Alternative	Relocate the existing artifact staging area currently located within the Preferred Alternative footprint.	Avoid potential damage to the artifacts during demolition and construction	Required to be completed before the start of construction
Alternative 2	Archaeological monitoring.	Avoid/minimize potential impacts to cultural resources	Required to be completed during construction
Preferred Alternative and Alternative 2	Ensure that all construction activities will occur within the limits of construction to prevent additional habitat loss.	Avoid/minimize potential impacts to the Mariana fruit bat	Required to be completed before the start of construction
Preferred Alternative and Alternative 2	Conduct pre-construction surveys of the project area to determine if Mariana fruit bats are in the area.	Avoid/minimize potential impacts to the Mariana fruit bat	Required to be completed before the start of construction
Preferred Alternative and Alternative 2	Construction contractors will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint at the start of each day where noise generating equipment will be used.	Avoid/minimize potential impacts to the Mariana fruit bat	Required to be completed prior to and during construction
Preferred Alternative and Alternative 2	Operators of the FFTF will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint prior to each use of the facility.	Avoid/minimize potential impacts to the Mariana fruit bat	Required to be completed prior to operations
Preferred Alternative and Alternative 2	Use shielded outdoor lights.	Avoid/minimize potential impacts to Mariana fruit bat and Migratory Bird Treaty Act species	Required to be completed during construction
Preferred Alternative and Alternative 2	Specify housekeeping and vehicle cleanliness measures in contractor environmental plans to reduce the likelihood of spread of invasive species within the construction area.	Avoid/minimize potential impacts to terrestrial biological resources	Required to be completed before the start of construction
Alternative 2	Transplant *Tuberolabium guamense* into protected areas.	Avoid/minimize potential impacts to protected species	Required to be completed before the start of construction

5 Other Considerations Required by the National Environmental Policy Act

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

In accordance with 40 Code of Federal Regulations section 1506.2(d), Table 5-1 identifies the principal federal and territorial laws and regulations that are applicable to the Proposed Action, and describes how compliance with these laws and regulations would be accomplished.

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

Federal, Territorial, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
Clean Air Act	Proposed Action in attainment area
Clean Water Act	NPDES permit to be obtained prior to construction
Coastal Zone Management Act	Complies (See Appendix C)
Endangered Species Act	Complies (See Appendix B)
EO 12088, Federal Compliance with Pollution Control Standards	Complies
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	Complies
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Complies
EO 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis	Complies
EO 14057 Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability	Complies
Federal Insecticide, Fungicide, and Rodenticide Act	Complies
Guam Air Pollution Control Act	Complies; obtain permit if required
Guam Safe Drinking Water Act	Complies
Migratory Bird Treaty Act	Complies
NEPA; CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA	EA in progress
National Historic Preservation Act of 1966; Programmatic Agreement Among the Department of Defense, The Advisory Council on Historic Preservation, The Guam State Historic Preservation Officer, and the Commonwealth of the Northern Mariana Islands State Historic Preservation Officer Regarding the Military Relocation to the Islands of Guam and Tinian	Complies (The Navy has prepared a Programmatic Agreement memo for their finding of No Historic Properties Affected for the Preferred Alternative.)
Resource Conservation and Recovery Act	Complies
Toxic Substances Control Act	Complies

Key: CEQ = Council on Environmental Quality; EO = Executive Order; NEPA = National Environmental Policy Act; NPDES = National Pollutant Discharge Elimination System

This page intentionally left blank.

6 References

American National Standards Institute. (1988). American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, ANSI S12-9-1988. New York: Acoustical Society of America.

Athens, J. S. (2009). Archaeological Surveys and Cultural Resources Studies on Guam and the Commonwealth of the Northern Mariana Islands in Support of the Joint Guam Build-Up Environmental Impact Statement. Volume I: Guam. Honolulu, HI: Prepared For NAVFAC PAC.

BMJ. (2013). Residential Exposure to Aircraft Noise and Hospital Admissions for Cardiovascular Diseases; Multi-Airport Retrospective Study. *BMJ, Correia, A.W, Peters, J.L., Levy, J.I., Melly, S., Dominici, F.*, 347:f5561.

Church, M. K., Hokanson, J. H., Gallison, J. D., & Jennings, M. H. (2009). *Cultural Resources Survey of 297 Acres at Andersen Air Force Base, Guam.* AAFB, Guam: Prepared by Andersen Air Force Base.

Council on Environmental Quality. (1997). Considering Cumulative Effects Under the National Environmental Policy Act. Washington, DC.

Cowan, J. P. (1994). *Handbook of Environmental Acoustics.* New York: John Wiley & Sons.

Craft, C. E., & Denardo, C. (2014). Architectural Assessment of North and South Finegayan Water Works, NCTS, Guam. Honolulu, HI: Garcia and Associates.

Department of Defense. (2009, June 16). Memorandum from the Under Secretary of Defense. *Methodology for Assessing Hearing Loss Risk and Impacts in DoD Environmental Impact Analysis*. Washington, DC.

Department of Defense. (2020). *Department of Defense Instruction 6055.06 DoD FIre and Emergency Services (F&ES) Program.* Retrieved from https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/605506p.pdf

Department of Defense. (2020). Information Paper. Reinstate Fire Department Training Complex into Project J-008 (Fire Station). Washington, DC.

Department of Defense. (2020, March). *UFC 3-210-10 Low Impact Development, With Change 3.* Retrieved from https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-210-10

Department of Defense. (2021, June). *UFC 4-730-10 Fire Stations, With Change 1.* Retrieved from UFC 4-730-10

Department of Defense Noise Working Group. (2009). Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics - Guide to Using Supplemental Metrics.

Department of the Air Force. (2015). Integrated Cultural Resources Management Plan, Andersen Air Force Base, Joint Region Marianas. Guam: Prepared for NAVFAC MAR.

Department of the Air Force. (2022). Environmental Assessment Space Control Squadron (SPCS) Beddown for the Fourth (SPCS #4) and FIfth (SPCS #5) Basing Actions Pacific Missile Range Facility-Barking Sands, Hawaii; Joiunt Base Pearl Harbor-Hickam, Hawaii; Andersen Air Force Base, Guam. Pearl Harbor, HI: Prepared by PACAF.

Department of the Air Force. (2022). *Environmental Impact Statement for Infrastructure Upgrades at Andersen Air Force Base, Guam.* Pearl Harbor, HI: Prepared by Air Force Civil Engineer Center.

Department of the Navy. (2000, September). *MCO 3500.27A - Operational RIsk Management.* Retrieved from http://www.navygirl.org/downloads/2008pmk/OPNAVINST3500.39A.pdf

Department of the Navy. (2013, Februrary). *OPNAVINST 11320.23G - Navy Fire and Emergency Services Program.* Retrieved from https://www.secnav.navy.mil/doni/Directives/11000%20Facilities%20and%20Land%20Management%20Ashore/11-300%20Utilities%20Services/11320.23G.pdf

Department of the Navy. (2018, March). *OPNAVINST 3500.39D - Operational Risk Management.* Retrieved from https://www.secnav.navy.mil/doni/Directives/03000%20Naval%20Operations%20and%20Readiness/03-500%20Training%20and%20Readiness%20Services/3500.39D.pdf

Department of the Navy. (2019, May 9). *SECNAVINST 3070.2A - Operations Security.* Retrieved from https://www.secnav.navy.mil/doni/Directives/03000%20Naval%20Operations%20and%20Readiness/03-00%20General%20Operations%20and%20Readiness%20Support/3070.2A.pdf

Department of the Navy. (2022). Final Environmental Impact Statement for Pearl Harbor Naval Shipyard And Intermediate Maintenance Facility Dry Dock and Waterfront Production Facility at Joint Base Pearl Harbor-Hickam, Oahu, Hawaii.

Department of the Navy. (2022). *Integrated Natural Resources Management Plan for Joint Region Marianas.* Prepared for Joint Region Marianas and NAVFAC Marianas, Guam by Cardno, Honolulu, HI. May.

Dixon, B. S., & Walker, S. (2011). Cultural Resources Investigations Conducted in the Territory of Guam Supporting the Joint Build-Up Environmental Impact Statement: Archaeological Surveys on Guam 2009 at Proposed Utility Sites, Harmon Annex, and Andersen AFB. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Dixon, B. S., Walker, S., & Schaefer, R. (2011). Final Cultural Resources Investigations Conducted in the Territory of Guam Supporting the Joint Guam Build-Up Environmental Impact Statement: Archaeological Surveys on Guam 2010 on Andersen AFB and Highway Utilities. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Dixon, B., McCurdy, T., Welch, D., Jones, R., Rudolph , T., & Nelson, I. (2017). Final Technical Report: Archaeological Data Recovery in Support of Construction for MILCON P-715 Live Fire Training Range Complex, Andersen Air Force Base, Yigo, Guam. .

Dixon, B., Rudolph, T., & Nelson, I. (2016). Final Data Recovery Plan Archaeological Data Recovery in Support of the J-001B Utilities and Site Improvements at Naval Base Guam Telecommunication Site, Guam. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Dixon, B., Welch, D., Rudolph, T., Jones, R., & Nelson, I. (2018). Final Technical Report: Archaeological Data Recovery in Support of the J-001B Utilities and Site Improvements at Naval Base Guam Telecommunications Site, Guam. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Eakin, J., Higelmire, K., & DeFant, D. G. (2012). Archaeological Data Recovery Report: Guam Military Relocation MILCON Projects P-100 (North Ramp Utilities) and P-101 (North Ramp Parking, Andresen Air Force Base, Territory of Guam. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Environmental Justice Interagency Working Group. (2016). Promising Practices for EJ Methodologies in NEPA Reviews: Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee.

Federal Interagency Committee on Aviation Noise. (1997). *Effects of Aviation Noise on Awakenings from Sleep.*

Federal Interagency Committee on Noise. (1992). Federal Review of Selected Airport Noise Analysis Issues.

Federal Interagency Committee on Urban Noise. (1980). *Guidelines for Considering Noise in Land Use Planning and Control.* Washington, DC.

Fire Apparatus Manufacturers Association. (2017). *Emergency Vehicle Size and Weight Guide.* Ocala, FL: Fire Apparatus Manufacturers Association.

Government of Guam. (2019, September). *Guam Administrative Rules and Regulations Title 22 Guam Environmental Protection Agency.* Retrieved from http://www.guamcourts.org/CompilerofLaws/GAR/22GAR/22GARTOC-001-1.pdf

Grecni et. al. (2020). Climate Change in Guam: Indicators and Considerations for Key Sectors. Report for the Pacific Islands Regional Climate Assessment. Retrieved from https://www.eastwestcenter.org/PIRCA-GUAM

Guam Power Authority. (2022). *GPA 180: New Power Plant Project*. Retrieved from https://guampowerauthority.com/gpa_authority/about/gpa_gpa_180_power_plant.php

Guampedia. (2022). *Ancient CHamoru Tool Making*. Retrieved from https://www.guampedia.com/ancient-chamorro-tool-making/

Harris, C. (1979). *Handbook of Noise Control.* New York: McGraw-Hill.

Hokuson, J., Kilby, J. D., Church, M., & McCurdy, M. R. (2008). Cultural Resources Survey for a Perimeter Fence and Portions of the Munitions Storage Area, Andersen Air Force Base, Guam. Guam: Prepared for Andersen Air Force Base.

Hunter-Anderseon, R. L., Dixon, B., & Mangieri, T. (2001). *Cultural Resources Survey of Five Navy Surplus Guam Land Use Plan Parcels, Territory of Guam. .* Pearl Harbor, HI: Prepared by NAVFAC PAC.

Jocson et. al. (2002). Recharge and aquifer response: Northern Guam Lens Aquifer, Guam, Mariana Islands. *Journal of Hydrology*, 231-254.

Joint Guam Program Office. (2010). Final Environmental Impact Statement. Guam and CNMI Military Relocation: Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force. Pearl Harbor, HI: Prepared by NAVFAC Pacific.

Joint Guam Program Office. (2015). Final Supplemental Environmental Impact Statement Guam and the Commonwealth of the Northern Mariana Islands Military Relocation (2012 Roadmap Adjustments). Pearl Harbor, HI: Prepared by NAVFAC Pacific.

Keener, V., Gingerich, S., & Finucane, M. (2015). *Climate Trends and Projections for Guam.* Honolulu, HI: East West Center information sheet.

Kurashina, H., McGrath, T., & Wooster, D. (1985). *Archaeological Survey of the Proposed Subdivision, Dededo, Guam.* Guam: Juan C. Tenori and Associates, Inc.

Levy, J. I. (2013). Residential Exposure to Aircraft Noise and Hopsital Admissions for Cardiovascular Diseases; Multi-Airport Retrospective Study. *BMJ*, 347:f5561.

Ludlow, B., & Sixsmith, K. (1999). Long-term Effects of Military Jet Aircraft Noise Exposure during Childhood on Hearing Threshold Levels. *Noise and Health*, 33-39.

Maxwell, J. J., Hlatky, N. M., & Huebert, J. M. (2020). Archaeological Data Recovery at Site 66-08-2955 in Support of J-0081B Finegayan Utilities and Site Improvements, Phase I, Naval Computer and Telecommunications Station (NCTS), Guam. Tamuning, Guam: Granite-Obayashi.

McNeill, J. R., & Welch, D. J. (1998). Military Exercises and Historic Sites in Military Training Areas on the Island of Guam: An Archaeological Assessment. Honolulu, HI: Belt Collins Hawaii.

Mohlman, G. (2015). Final Report: Historic Inventory Survey, Andersen Air Force Base, Territory of Guam. Pearl Harbor, HI: Prepared by NAVFAC PAC.

National Fire Protection Agency. (2019). *1402 Standard on Facilities for Fire Training and Associated Props.* Quincy, MA: National Fire Protection Agency.

National Institute for Occupational Health and Safety. (1998). *Criteria for a Recommended Standart Occupational Noise Exposure, Revised Criteria.* Cincinnati: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

Naval Facilities Engineering Systems Command Pacific. (March 2022). *Final Guam Landscaping Guidelines, Revision 3.*

Pacheco, R., Reith, T. M., & DiNapoli, R. (2020). Archaeological Monitoring in Support of J-001B Finegayan Utilities and Site Improvements Phase I, Naval Computer and Telecommunications Station, Guam. Pearl Harbor, HI: Prepared by NAVFAC PAC.

Root, K. S., Schwennker, C., Autenrieth, D., Sandfort, D. R., Lipsey, T., & Brazile, W. J. (2013). Firefighter Noise Exposure During Training Activities and General Equipment Use. *Journal of Occupational and Environmental Hygiene*, 116-121.

United States Bureau of Land Management. (1986). *Manual H-8410-1, Visual Resource Inventory.*

United States Bureau of Land Management. (1986). *Manuel 8431 Visual Resource Contrast Rating.*

United States Census Bureau. (2020). 2020 Island Areas Censuses: Guam. Retrieved from https://www.census.gov/data/tables/2020/dec/2020-guam.html

United States Department of Transportation Federal Highway Administration. (2006). *FHWA Highway Construction Noise Handbook.* Cambridge, MA: United States Department of Transportation.

United States Environmental Protection Agency. (1974). Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with and Adequate Margin of Safety. EPA 550/9-74-004. Washington, DC: Office of Noise Abatement and Control.

United States Environmental Protection Agency. (1982). *Guidelines for Noise Impact Analysis. EPA 550/9-82-105.* Washington, DC: Office of Noise Abatement and Control.

United States Environmental Protection Agency. (2012). Cool Pavements. *Reducing Urban Heat Islands: Compendium of Strategies*. Retrieved from https://www.epa.gov/heat-islands/heat-island-compendium

United States Environmental Protection Agency. (2022). *Facility Level Information on GreenHouse gases Tool (FLIGHT)*. Retrieved from ghgdata.epa.gov

United States Environmental Protection Agency. (2023). *NAAQS Table*.

United States Fish and Wildlife Service. (2017). Reinitiation of the 2015 Biological Opinion on the Department of the Navy's Relocation of U.S. Marine Corps from Okinawa to Guam and Associated Activities on Guam (Consultation 01EPIF00-2015-F-0025 and 01EPIF00-2016-F-0185). Honolulu, HI: Pacific Islands Fish and Wildlife Office.

United States Geological Survey. (2019). Freshwater Availability in Guam with Projected Changes in Climate. *Pacific RISA*.

United States Geological Survey. (2019). Water Resources on Guam - Potential Impacts of and Adaptive Response to Climate Change. Reston, VA: United States Geological Survey.

United States Marine Corps. (2017, August). *Marine corps Order 11000.11A - Marine Corps Fire Protection and Emergency Services Program.* Retrieved from https://www.marines.mil/Portals/1/Publications/MCO%2011000.11A.pdf

WeatherSpark. (2022). *Climate and Average Weather Year Round in Guam*. Retrieved from https://weatherspark.com/y/150233/Average-Weather-in-Guam-Year-Round

World Sea Temperatures. (2022). Retrieved from https://www.seatemperature.org/australia-pacific/guam/tamuning-tumon-harmon-village.htm

This page intentionally left blank.

7 List of Preparers

This EA was prepared collaboratively between the Navy, United States Marine Corps, and contractor preparers.

U.S. Department of the Navy

Kerry Kylene Wells (NAVFAC Pacific)
Education: B.S., Physics
Years of Experience: 20
Project Role: Environmental Assessment (EA) Project Manager

Vi Verawudh, AICP, LEED AP (NAVFAC Pacific)
Education: Master of Urban and Regional Planning
Years of Experience: 18
Project Role: EA Assistant Project Manager

Elizabeth Scheimer, (NAVFAC Pacific)
Education: M.S., Earth Systems
Years of Experience: 15
Project Role: EA Assistant Project Manager

Coralie Cobb, (NAVFAC Pacific)
Education: B.A., General Biology
Years of Experience: 33
Section(s) person is responsible for: Terrestrial Biological Resources

Adam Lauer, Archaeologist (NAVFAC Pacific)
Education: Ph.D., Anthropology
Years of Experience: 15
Section(s) person is responsible for: Cultural Resources

Doris Frey, F.E. (NAVFAC Pacific)
Education: B.S., Environmental Resources Engineering, M.S. Civil Engineering
Years of Experience: 26
Section(s) person is responsible for: Air Quality

Richard Salas, (Marine Corps Base Camp Blaz)
Education: M.S., Land Use Planning Policy
Years of Experience: 3
Section(s) person is responsible for: Coastal Zone Management Act Coastal Consistency Determination

HHF Planners (Prime Contractor)

Thomas A. Fee, AICP, LEED AP ND
B.A., Economics and Master of Urban and Regional Planning
Years of Experience: 38
Responsible for: Principal in charge; Overall Quality Assurance/Quality Control

John Hagihara, AICP
B.A., Economics and Master of Urban and Regional Planning
Years of Experience: 10
Responsible for: NEPA EA Project Manager; Primary Author: Purpose and Need, Proposed Action and Alternatives, Noise, Visual Resources, Water Resources, Environmental Justice

HHF Planners Subcontractors

Tim Rieth (International Archaeology, LLC)
B.A., Anthropology; M.A., Anthropology
Years of Experience: 23 years
Responsible for: Cultural Resources

Eric Harlow (EA Engineering, Science, and Technology, Inc., PBC)
B.S., Geology; B.S., Natural Resource Management; M.S., Hydrology
Years of Experience: 18 years
Responsible for: Terrestrial Biological Resources, Air Quality

8 Distribution List

This EA was distributed to the following agencies/people.

Federal Agencies

U.S. Fish and Wildlife Service Refuge

U.S. Fish and Wildlife Service Ecological Services

National Park Service

Territory of Guam Agencies

Guam Bureau of Statistics and Plans

Guam Bureau of Public Safety

Guam Environmental Protection Agency

Guam State Historic Preservation Office

Guam Department of Agriculture

Mayors Council of Guam

Other Organizations

Community Defense Liaison Office

This page intentionally left blank.

Appendix A
Public and Agency Participation
(To Be Provided in Final EA)

This page intentionally left blank.

Appendix B
Endangered Species Act Documentation

This page intentionally left blank.

UNITED STATES MARINE CORPS
MARINE CORPS BASE CAMP BLAZ
PSC 488 BOX 105
FPO AP 96537-0149

May 2, 2023

Dr. Earl Campbell
Field Supervisor
Pacific Islands Fish and Wildlife Office
Department of Interior
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Håfa Adai, Dr. Campbell:

SUBJECT: REQUEST FORMAL CONSULTATION FOR FIREFIGHTER TRAINING FACILITY AT MARINE CORPS BASE CAMP (MCB) BLAZ, FINEGAYAN, GUAM

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), this document serves to request formal consultation with the United States Fish and Wildlife Service for the proposed construction and operation of a firefighter training facility (FFTF) at MCB Camp Blaz to support the MCB Camp Blaz Fire Department staff in meeting Commander, Navy Installations Command (CNIC) mandatory training and certification requirements. We appreciate your staff's advice to revise our approach from an informal consultation to a formal consultation to facilitate future training needs.

MCB Camp Blaz requests your biological opinion with the determination as described in the enclosed biological evaluation. Should you have any questions or require additional information, MCB Camp Blaz technical point of contact is Ms. Coralie Cobb. She can be reached at (720) 542-3085 or email at coralie.cobb@navy.mil.

Senseramente,

Digitally signed by BORJA.ALBERT.T.1283962918
Date: 2023.05.02 14:11:59 +10'00'

Albert Thomas T. Borja
Installation Environmental Program Director
By Direction of the Commanding Officer

Enclosure 1. Formal Biological Evaluation of Firefighter Training Facility at MCB Camp Blaz

Formal Biological Evaluation
Firefighter Training Facility
Marine Corps Base (MCB) Camp Blaz

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq), this document serves to solicit formal consultation from the United States Fish and Wildlife Service (USFWS) for the federally listed threatened *Pteropus mariannus mariannus* (Mariana fruit bat or fanihi) associated with the proposed construction and operation of a Firefighter Training Facility at MCB Camp Blaz, Guam.

Description of the Proposed Action:

MCB Camp Blaz proposes to construct and operate a Firefighter Training Facility (FFTF) at MCB Camp Blaz to support the MCB Camp Blaz Fire Department personnel in meeting Commander, Navy Installations Command (CNIC) mandatory training and certification requirements, as well as to meet the Aggregate Response Time (ART) required by DoDI 6055.06. The FFTF is critical to ensure all MCB Camp Blaz firefighting personnel maintain proficiency and can operate safely and effectively in all capabilities required per the installation's scope of services, in support of the relocation of forces from Okinawa, Japan.

The Proposed Action would consist of four training facilities; 1) an emergency vehicle operator course (EVOC); 2) a six-story enclosed firefighter training tower; 3) firefighter training mockups; and 4) a covered observation/control facility. All facilities must be constructed to meet National Fire Protection Association 1402 standards.

Several six-story bachelor enlisted quarters and bachelor officer quarters are currently being constructed at MCB Camp Blaz. Currently, there is no multistory firefighting training tower on Guam. Thus, a six-story training tower is needed to provide ladder truck operation training in accordance with NFPA 1402 Standard. NFPA 1402 Standard also requires 11 training mockups, an EVOC, and a covered observation/control facility.

Firefighters are required to be in "response status" during training. DoDI 6055.06 Section 7.2, Table 1 establishes a seven-minute ART for emergency fire response. Therefore, the FFTF components need to be co-located within the MCB Camp Blaz installation boundary, in order to meet the DoDI 6055.06 response time requirement. Co-locating all of the training components in one location would also provide operational and cost efficiency.

The FFTF's footprint would be approximately eight acres and would be located at the south end of MCB Camp Blaz on the Andreen Softball field (Figure 1). The site is within the MCB Camp Blaz installation boundary, adjacent to Route 3 and the existing MCB Camp Blaz security gate. The existing softball field, appurtenant structures, and the adjacent tennis courts would be demolished and the extant road surface to the softball field will be hardened to accommodate the increased weight and traffic of fire and emergency vehicles. New utility lines would be constructed to connect the proposed FFTF to utility points of connection within MCB Camp Blaz.

The majority of construction activities will take place during normal working hours (6:00 AM to 3:30 PM), but night-time construction may occasionally be required. Night-time work may be required to de-conflict munitions of explosive concern (MEC) arcs and nearby operations or if

contractor falls behind schedule and needs to recoup time. The overall construction period is expected to be within two years of construction award.

Facilities

The FFTF would consist of the four primary facilities described in Table 1. Construction of the proposed facilities would incorporate Leadership in Energy and Environmental Design, commonly referred to as LEED, and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

Table 1 Proposed FFTF Training Facilities

Facility	***Description***
EVOC	The EVOC would be an approximately six-acre (24,280 m^2) paved surface that would enable the base fire and rescue vehicle operators to improve and maintain their driving skills in responding to fire and emergency situations. As newer models of fire and emergency vehicles increase in size and weight, vehicle operators must be able to proficiently control the speed and maneuverability of their vehicles for safe and effective operations. The EVOC would be a flat, paved area where cones can be placed and configured for different training exercises. Vehicles used on the EVOC would include four-man engine trucks, four-man ladder trucks, two-man pumper trucks, and other emergency vehicles.
Training Tower	The six-story training tower would match the height of the tallest BEQs on MCB Camp Blaz. The training tower would have a footprint of approximately 7,200 square feet (689 m^2), and the structure would consist of reinforced and protected (including from extreme heat and fire) concrete with all necessary components such as roof, walls, flooring, foundation, windows, and doors appropriate to Guam seismic, typhoon, and tropical environmental conditions. The tower would be fitted with a range of training related improvements including: rappelling hooks on roof and rappelling safety-nets; a working elevator; a search maze on the ground floor; smoke machines; standpipe connections on each floor and/or in stairwell; enclosed stairwell all the way to the roof from ground floor; exterior ladders mounted on structure accessible from ground floor up to highest level; and training props (including live-firefighting props; one per floor).
Mockups	The training facility would include 11 firefighter "training mockups." A mockup is a life-size version of a particular scenario that a firefighter may encounter. The mockup allows firefighters to train on a real-world example in a controlled environment. For example, an automobile mockup would contain an automobile that firefighters can use to practice fire extinguishing techniques. The mockups would be constructed on a paved 2-acre area outside of the EVOC. Vehicle circulation would be provided from the training area entry to the area surrounding each mockup. The 11 training mockups to be constructed per NFPA 1402 are: 1 Roof Chop Trainer 2 Vehicle Extraction Area 3 Drafting Pit Area 4 Horizontal Tank Prop* 5 Automobile Prop* 6 Dumpster Prop* 7 Structural Collapse/Search & Rescue Area 8 Hazmat Containment/Decontamination Training Area 9 Portable Fire Extinguisher Prop* 10 Simulated Electrical Powerlines 11 Vertical Fuel Storage Tank Prop* * Live-firefighting simulation

Table 1 Proposed FFTF Training Facilities

Facility	*Description*
Covered Observation/ Control Facility	The covered observation/control facility would be a two-story building with an approximately 2,500 square foot (232m^2) building footprint. It would be an air-conditioned structure consisting of reinforced and protected concrete with all components such as exterior roof, walls, flooring, foundation, windows and doors, stairs enclosures, mechanical, electrical, plumbing, utilities, and information systems appropriate to Guam's seismic, typhoon, and tropical environmental conditions. On the second floor, the observation area will allow instructors and simulation controllers to observe and control all the training equipment and activities in the training area. The facility would have a camera system to monitor the entire training area and control systems to control the gas fuel, audio/video, communications, mechanical, electrical, and related utilities. All the training and non-training related equipment/entities will be managed in this observation area.

Key: EVOC = Emergency Vehicle Operator Course; BEQ = Bachelor Enlisted Quarters; MCB = Marine Corps Base; NFPA = National Fire Protection Agency; m^2 = Square meter

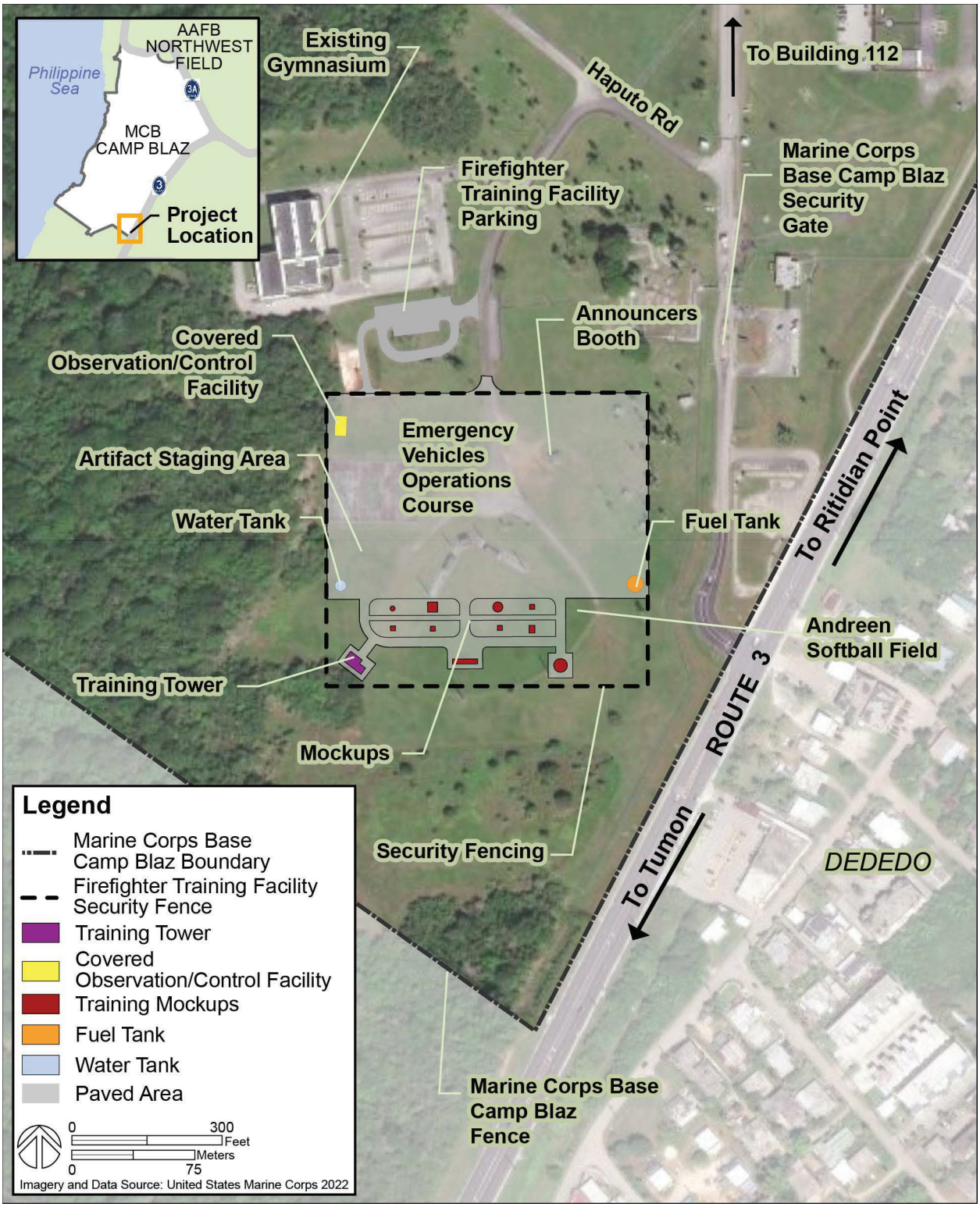


Figure 1 Proposed Action – Conceptual Site Plan

Utilities Infrastructure

The Proposed Action would include utilities improvements for water, wastewater, propane, electrical, and telecommunications infrastructure. Underground water, wastewater, and electrical utilities would be installed from the project site to the nearest point of connection on Haputo Road, approximately 750 feet (228 meters) north of the proposed site. The Proposed Action would include installation of a 2,000 foot-long (610 meters) underground communications line to a point of connection at building farther north of the site. Specific utility line locations and points of connection are not shown in Figure 1 due to operational security (OPSEC) guidelines. Stormwater at the site will be managed according to guidelines in Unified Facilities Criteria (UFC) 3-210-10 Low Impact Development.

Within the project site, utility distribution would be provided underground to service the necessary facilities. The Proposed Action includes the construction of an aboveground propane tank (approximately 10,000 gallon [37,854 liters]) and an aboveground water tank (approximately 21,000 gallons [79,494 liters]). The propane tank would be connected to the various facilities, via underground propane piping, to supply propane for the live-firefighting mockups.

Site Improvements

Site improvements for the Proposed Action are included in the table below (Table 2).

Table 2 Site Improvements for Proposed Action

Improvement	***Description***
Site Preparations	The FFTF footprint proposed in the Proposed Action is within a previously developed area of MCB Camp Blaz. The area would be grubbed and graded prior to construction of the proposed FFTF. Extant properties which are occupying the proposed FFTF site will be demolished to accommodate the new facilities. Two (2) facilities in total are extant within the proposed footprint. Facility #159 ("Andreen Softball Field"), Facility #159C ("Announcers Booth") and associated utilities, poles, tennis courts, slabs, fence, and structures would be demolished. There is also an existing, temporary artifact staging area within the proposed FFTF footprint that would be relocated to a nearby location to avoid potential impacts to the staged artifacts. The staging area was established as a temporary site to house *lusong* artifacts collected during ground disturbing activities for the development of MCB Camp Blaz. *Lusong* are large stones that were used by Chamorros during food preparation, similar to a mortar and pestle (Guampedia, 2022). A vegetation screen meeting the MCBCB Guam Landscaping Guidelines would be incorporated as part of final landscaping.
Site Access Roads and Parking	Access to the Proposed Action would be provided by the existing Andreen Softball Field access road. Parking would be provided at the existing parking lot located south of the existing gymnasium. The access road and parking lot would be resurfaced to support the increased weight and traffic of emergency vehicles accessing the training facility.
Anti-Terrorism/ Force Protection and security fencing	The Proposed Action would provide ATFP features and comply with ATFP regulations and physical security in accordance with DoD Minimum Anti-Terrorism Standards for Buildings. Security fencing would be installed along the perimeter of the proposed FFTF site. The fence would be approximately eight feet tall. Barbed wire is not required. Building exterior and site lighting would be provided. All lighting would be shielded to reduce light pollution and potential impacts to wildlife.

Key: FFTF = Firefighter Training Facility; MCB = Marine Corps Base; ATFP = Anti-Terrorism/Force Protection; DoD = Department of Defense

Operations

The proposed FFTF would not be occupied on a regular basis. The facility would be used intermittently for training exercises and maintenance as needed. There are no permanently based personnel (PN) proposed for this facility. The majority of training events would take place during normal working hours (6:00 AM to 3:30 PM), but night-time training events would occasionally be required. Night-time training is expected to take place approximately once per quarter and would conclude by approximately 9:00 PM, at the latest. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the use of shielded outdoor lights to protect wildlife species and light pollution on to the public right of way along Route 3.

The Proposed Action would include the installation of a public address system (estimated between 90-100 dB) to instruct training participants during their exercises. The public address system would not be used during night training events aside from in an emergency. Some training exercises would utilize live-firefighting scenarios, using burning hay or pallets, which would generate visible flames at the facility (referred to as Class A combustibles) or the propane mockups (referred to as a Class B combustible). Hay and wood pallets will only be used inside the Training Tower. The anticipated volume of fuel (hay and wood) per training is approximately 3-5 pallets or 50 lbs. of hay (i.e. half bail). Annual usage is conservatively anticipated to be 1 ton per year of wood and 1 ton per year of hay. The hay/wood pallet fires will be confined to the interior of the training tower and does not present a hazard of wildfires. The Dumpster prop and Portable Fire Extinguisher prop will be propane fueled trainers. The exterior training props are all propane fueled and there will be no flying or falling embers, therefore no concern with regards to starting errant wildfires. In addition, the training area will be paved and the props will be located within the paved areas. Domestic water would be used by the fire firefighters to simulate real fire suppression methods.

The FFTF would be used once per month by several fire crews consisting of engine trucks, ladder trucks, pumper trucks, and various emergency vehicles. A typical training event involves the use of the EVOC and/or training props for an approximately three-hour period (one-hour instruction, one-hour hands-on training, one-hour after-action review). The average number of vehicles per training event is estimated at six firefighting vehicles. There will be variations of this average training event depending on threats and training demands, but this is considered a reasonable average case. Once per quarter, larger training events will occur involving up to 28 personnel and ten vehicles. All personnel will arrive and depart using their assigned vehicles.

The facility would be open for operations during weekdays between 6:00 AM to 3:30 PM. Occasional weekend training would occur during the same hours. Night time training would occur quarterly with training ending no later than 9:00 PM. The facility is planned to operate throughout the life cycle of MCB Camp Blaz.

Primary users of the facility would be MCB Camp Blaz Firefighters; however, other mutual aid partners may also use the facility for joint training exercises. A mutual aid agreement is an agreement between fire departments (in this case Federal fire departments and local Guam fire departments) to provide joint training opportunities, and additional support in case of emergencies that overwhelm the capacity of a single fire department.

Threatened and Endangered Species within the Action Area

Mariana Fruit Bat/ fanihi (*Pteropus mariannus mariannus)*

Population Estimates:

For purposes of this consultation, the following terms are defined to ensure clarity as it relates to the conservation measures. These terms are based on communications with Dr. Tammy Mildenstein

(Associate Professor at Cornell College with a PhD focus on the conservation of globally endangered fruit-eating flying foxes).

> Colony – a population of bats (assumed to be interbreeding) aggregating at a particular roosting location. Individuals within the colony have strong fidelity to the colonizing population and to the roost site. If the roost is disturbed, a colony will most often relocate to a different roosting site as a group.
>
> Roost – the location to which a colony of fruit bats returns, after nocturnal foraging, to spend the day resting and interacting. Roosts generally are where the breeding population (aka colony) meets up every morning and emerges from in the evening rather than where a singleton or small group may temporarily rest.
>
> Foraging – the action of searching for food away from the roost site.
>
> Foraging locations - any area where bats search for food (this generally refers to areas within a bat's habitat used regularly (seasonal or periodic)). Foraging locations may still be close to the roost site.
>
> Stop over locations – the locations outside of the roost site where bats may stop flying and hang (usually in a tree canopy) either to forage or rest or interact with other individuals (the term is used to differentiate a regularly used roost site by the colony from various locations that bats may hang out during their night time foraging flights).

According to the *Mariana Fruit Bat 5-Year Review*, there are approximately 82 Mariana fruit bats estimated to inhabit the 212 square miles of Guam (DAWR 2020 in USFWS 2020). Andersen Air Force Base (AAFB) conducted base-wide surveys between 2018 and 2021. In addition to the recorded number of bats detected during these surveys, the following population sizes were estimated based on area and flight simulation methods for detecting probability (US Navy 2022):

Year	Count	Estimate (area)	Estimate (flight)
2018	32	76	59
2019	50	99	85
2020	35	92	69
2021	64	126	108

In addition, a density estimate was calculated based on the number of bats counted and the amount of unpaved area inside the view sheds covered by the survey. For the 2021 data, the estimated density of bats on AAFB is:

$$64 \text{ bats}/6541 \text{ acres} = 9.78 \times 10^{-3} \text{ bats/acre or } 0.00978 \text{ bats per acre}$$

At MCB Camp Blaz, approximately 740 acres of land clearing has occurred to support the relocation of Marines to Guam with an average of 800 construction personnel onsite daily in the area since 2017. As part of the construction program, surveys for Mariana fruit bats have been conducted and no Mariana fruit bats have been observed during surveys by the MCB Camp Blaz environmental team or our construction contractors (monitoring for Mariana fruit bats is part of their construction contract and documented in annual reports to USFWS). Only one Mariana fruit bat has been observed by a MCB Camp Blaz environmental team member while driving along Route 3.

Additionally, there are no known colonies of bats on MCB Camp Blaz. The closest potential colony site is at the top of the cliffline above the combat arms training and maintenance (CATM) range on AAFB (approximately six miles from the proposed firefighting training facility). It is very likely this area of high Mariana fruit bat activity on AAFB reflects a small roosting colonies (US Navy 2022). It is of note that the location of the colony site is above (south of) the CATM range and north of the AAFB airfield. The CATM ranges supports training with pistols, rifles, machine guns up to 7.62 millimeters, and inert mortars up to 60 millimeters. Training is also conducted with the M203 40-millimeter grenade launcher using inert training projectiles only (DON 2010). This would seem to indicate that the sight, smell or sound of humans and the noise related to the use of the range (pistols, rifles, machine guns, mortars and grenade launchers) does not deter the establishment of a colony.

In 2021, there were a large number (>1400 individuals) of Mariana fruit bats using the Tarague Plateau area on a seasonal or cyclic basis. Although this similar situation has been repeated several times over the past seven years (2015, 2018, 2019, 2020, 2021) with large numbers over several weeks followed by a sudden departure from the roosting station of the majority of the bats, the trigger of the departure remains unknown (U.S. Navy 2022).

Sensitivity to Human Activities

In the 2006 Intelligence, Surveillance and Reconnaissance (ISR) biological opinion, Mr. Dustin Janeke was referenced as stating "Observations of roosting bats near construction activities indicate that bats were not disturbed by activities 150 m (492 ft) away from the roost site (Janeke, D., pers. comm. 2006)." Mr. Janeke was contacted in 2021 and he indicated that this information may have been a result from his observations of bats at the Pati Point colony and their lack of a noticeable response to jet noise as aircraft departed AAFB. "If I recall correctly, ISR Strike would have increased the flight activity on AAFB and I was most likely commenting on the fact that the colony was acclimated to flight noise, and would likely acclimate to additional levels of flight noise if the frequency of noise was increased." (Personal communication between D. Janeke and Coralie Cobb, November 2021).

While fruit bat colonies can be very easily disturbed by the sight, smell, or sound of humans (Mildenstein and Boland 2010), resting or foraging bats (not at a colony) are approachable at relatively close distances. A 2012 study on Guam documented three encounters with Mariana fruit bats where the observers were able to get within 5 to 21m of roosting bats. During all three encounters, the Mariana fruit bats (2 individual males and one male and one female) eventually

departed their roost site but only after considerable time had passed (30 to 69 minutes) despite the presence of one or two observers (SWCA 2012).

Bat sensitivity is further documented with species of flying foxes in Queensland and New South Wales. Over a number of decades, both Queensland and New South Wales have formed flying fox consultative committees to work on identifying control methods to discourage the bats from foraging within mango and papaya orchards. The findings found that flying foxes will become accustomed to smell, sounds (if they are not met with real danger) and light (lights can be initially successful, however flying foxes become accustomed to the light and will feed in a fully illuminated orchard).

Recent research on fruit bats has shown how the capability for sophisticated echolocation not only evolved multiple times in groups of bats, but also that it *never* evolved in fruit bats. All bats — apart from the fruit bats of the family Pteropodidae (also called flying foxes) — can "echolocate" by using high-pitched sounds to navigate at night (Lopez-Aguirre and Wilson 2021).

Avoidance and Minimization Measures

To avoid or minimize impacts to Mariana fruit bats, the following will be conducted:

1. DON will ensure that all construction activities will occur within the limits of construction to prevent additional habitat loss. Limits of construction must be shown on contract plans and specifications and physically demarcated in the field prior to any vegetation clearing. This measure is intended to prevent additional habitat loss. The measure will be implemented during pre-construction and construction.
2. Pre-construction surveys for Mariana fruit bats will be conducted by a qualified biologist the day before and the day of vegetation clearing of Mariana fruit bat habitat.
    - Qualified biologist is defined as a person who has successfully completed a full four-year course of study in an accredited college or university leading to a bachelor's or higher degree, which includes a major field (24 semester hours) of study in biological sciences, wildlife biology, botany, natural resource management, environmental sciences, or related disciplines appropriate to this position or an appropriate combination in education and experience AND a minimum of 100 documented hours conducting Mariana fruit bat surveys or monitoring or closely related species.
3. Construction contractors will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint at the start of each day where noise generating equipment will be used. If Mariana fruit bats are observed prior to the start of work in the project footprint, work will be postponed until the Mariana fruit bat has left the area of its own volition. If bats enter the project footprint after the start of construction, work will continue.
4. Operators of the FFTF will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint prior to use of the facility. If Mariana fruit bats are observed prior to the start of training, work will be postponed until the Mariana

fruit bat has left the area of its own volition. If bats enter the project footprint after the start of training, work will continue.

5. Changes to the night sky resulting from operations-related nighttime lighting would be minimal through the use of shielded outdoor lights to protect Mariana fruit bats.
6. Per OPNAV M-5090.1 §12-3.9, the DON will specify housekeeping and vehicle cleanliness measures in contractor environmental plans to reduce the likelihood of spread of invasive species within the construction area. To the extent practicable and to be performed in conjunction with stormwater pollution prevention practices, cargo and vehicles will be inspected upon entry to the construction site and high-pressure wash-down will be performed to reduce organic material and mud from leaving or entering the jobsite. Dirty vehicles, equipment or cargo shall be cleaned of dirt, debris, organisms, weeds and other material before they enter the jobsite and discarded material will be tested, packaged or treated before disposal. Green waste will be reused on-base to the greatest extent practicable and will be managed to reduce Coconut Rhinoceros Beetle and Little Fire Ant spread or breeding.

Effects Determination

The project footprint for the Proposed Action currently consists of developed land, including tennis courts, a softball field, parking areas, and maintained lawns. The initial land clearing and grading associated with the Proposed Action will impact 9.2 acres of developed land and 0.1 acres of degraded limestone forest. Since the area is already developed or degraded, the construction of the Proposed Action would not significantly affect, modify or degrade existing Mariana fruit bat habitat. Directly adjacent to the Proposed Action project footprint is approximately 50 acres of secondary limestone forest and the Marine Corps Relocation Program has identified a forest enhancement area that is approximately 500 meters from the Proposed Action project footprint.

The construction and operational activity associated with the Proposed Action would not result in death or injury to the Mariana fruit bat by significantly impairing essential behavioral patterns, including, breeding, feeding, or sheltering as: (1) pre-construction surveys for Mariana fruit bats will be conducted by a qualified biologist the day before and the day of vegetation clearing of Mariana fruit bat habitat; (2) construction contractors will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint at the start of each day where noise generating equipment will be used; (3) operators of the FFTF will be trained by a qualified biologist to identify Mariana fruit bats and conduct visual observations of the project footprint prior to use of the facility. If Mariana fruit bats are observed prior to the start of training, work will be postponed until the Mariana fruit bat has left the area of its own volition; (4) changes to the night sky resulting from operations-related night-time lighting would be minimal through the use of shielded outdoor lights to protect Mariana fruit bats; and (5) Mariana fruit bats that are outside of a colony (i.e., foraging or resting) are less sensitive to human disturbances (sight, smell, or sound) and able to utilize adjacent forested areas and have been documented to habituate or acclimate to these potential stressors.

Based on the one observance of a Mariana fruit bat during the six years of surveys and monitoring in the surrounding area the construction and operation of the Proposed Action does not create the

likelihood of injury to Mariana fruit bats, nor will it significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. However, after discussions with USFWS, due to the cyclic increases in Mariana fruit bats although unlikely in the foreseeable future, we are requesting formal consultation to ensure that if a Mariana fruit bat colony establishes within 492 feet (150 meters) of the Proposed Action construction and operations of the Proposed Action can proceed.

References:

Guam Department of Aquatic and Wildlife Resources (DAWR). 2020. Fanihi Quarterly Meeting Minutes. January 13, 2020.

Guampedia. (2022). *Ancient CHamoru Tool Making*. Retrieved from https://www.guampedia.com/ancient-chamorro-tool-making/

Lopez-Aguirre, Camilo and Wilson, Laura A.B., 2021. Fruit bats are the only bats that can't (and never could) use echolocation. Now we're closer to knowing why. March 2021.

Queensland Government. Queensland and New South Wales Flying Fox Consultative Committee Flying fox control methods research findings

USFWS, 2020. 5-YEAR REVIEW Short Form Summary Species Reviewed: Mariana fruit bat, Fanihi (*Pteropus mariannus mariannus*).

U.S. Navy, 2022. Monitoring Mariana fruit bats on Andersen Air Force Base, 2021. Prepared for NAVFAC Marianas, Guam. Prepared by Tammy Mildenstein, University of Guam, under Cooperative Agreement Number N40192-15-2-8001.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2023-0081810

May 17, 2023

Mr. Albert T. Borja
Installation Environmental Program Director
Marine Corps Base Camp Blaz
PSC 488 Box 105
FPO AP 96537-0149

Subject: Initiation of Consultation for Firefighting Facility (J-008), Marine Corps Base Camp Blaz, Guam

Dear Mr. Borja:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your May 3, 2023, letter requesting initiation of formal consultation to address effects of the proposed construction and operation of a firefighter training facility (J-008) at Marine Corps Base Camp Blaz, Guam, to the federally threatened Mariana fruit bat (fanihi, *Pteropus mariannus mariannus*), pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.). All information required of you to initiate consultation was either included in your letter or is otherwise accessible for our consideration and reference, pursuant to the regulations governing interagency consultations (50 CFR 402.14). We have assigned reference number 2023-0081810 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion no later than September 15, 2023 (135 calendar days after receipt of initiation request). Pursuant to the 2019 *Consultation Agreement Between U.S. Department of the Navy and U.S. Fish and Wildlife Service, Region 1, for Endangered Species Act Section 7 Consultations*, the Service will provide the Department of Navy a preliminary draft biological opinion on or before day 100 of the consultation process. Therefore, we expect to provide you with a preliminary draft biological opinion no later than August 11, 2023 (100 calendar days after receipt of initiation request).

Thank you for participating with us in the protection of our endangered species. As a reminder, the Endangered Species Act requires that after initiation of formal consultation, the federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats. If you have any questions or concerns about this consultation or the consultation process in general, please contact Lauren Taylor; Fish and Wildlife Biologist at (808) 792-9400 or lauren_taylor@fws.gov or Jacqueline Flores, Mariana Islands Team Manager at jacqueline_flores@fws.gov or via telephone at (671) 989-6744/ (671) 787-6094.

Sincerely,

For JACQUELINE FLORES Digitally signed by JACQUELINE FLORES Date: 2023.05.17 14:21:50 +10'00'

Michelle D. Bogardus
Assistant Field Supervisor
Pacific Islands Fish and Wildlife Office

Appendix C
Coastal Consistency Determination

This page intentionally left blank.

UNITED STATES MARINE CORPS
MARINE CORPS BASE CAMP BLAZ
PSC 488 BOX 105
FPO AP 96537-0149

December 5, 2022

Ms. Lola Leon Guerrero
Director
Guam Bureau of Statistics and Plans
P.O. Box 2950
Hagåtña, Guam 96932

Håfa Adai, Ms. Leon Guerrero:

SUBJECT: FISCAL YEAR 2023 MARINE CORPS BASE CAMP BLAZ (MCBCB) VERTICAL CONSTRUCTION PROJECT: J-008-1, DEDEDO, GUAM

MCBCB requests the Bureau of Statistics and Plan's (BSP) review of our phased coastal determination for the subject project as part of the 2015 Record of Decision (ROD) for the Marine Corps Relocation on Guam. This phased determination includes the J-008-1 Firefighter Training Facilities project. BSP's conditional concurrence with the Navy's Programmatic Consistency Determination (PCD) was formalized on 27 August 2014, which included BSP's renewed support of the phased determination process.

The Navy has assessed any reasonably foreseeable direct and indirect effects on Guam's defined coastal zone, and reviewed relevant management programs (enforceable policies) of the Guam Coastal Management Program (GCMP) in accordance with the Coastal Zone Management Act (CZMA). Based on the analyses enclosed, the J-008-1 project at MCBCB may have discernible spillover (indirect and cumulative) impacts to the Guam coastal zone. There would be no direct impact to the coastal zone as MCBCB has confined reasonably foreseeable effects to land under federal jurisdiction and although J-008-1 project would have spillover impacts, the Marine Corps Relocation program would comply with and would be conducted (or supported) in a manner consistent with the policies of the GCMP to the maximum extent practicable. MCBCB will incorporate programmatic requirements as set forth by the BSP in prior conditional concurrence into project requirements.

Please see enclosures for J-008-1 project description, vicinity map, coastal effects determinations and other supporting information. I appreciate your ongoing support. If you have any questions relating to this submission, please contact Mr. Rick Salas, MCBCB Environmental Planner, by telephone at (671) 362- 7204 or by email at richard.c.salas@usmc.mil.

Senseramente,

Albert Thomas T. Borja
Installation Environmental Program Director
By Direction of the Commanding Officer

Enclosure 1. Fiscal Year 2023 MCBCB Vertical Construction Project: J-008-1

EFFECTS TEST AND DETERMINATION UNDER COASTAL ZONE MANAGEMENT ACT

Project: Fiscal Year 2023 Camp Blaz Vertical Construction Project: J-008-1 Fire Fighting Training Facilities	**Date:** 05 December 2022
Project Location: Marine Corps Base, Camp Blaz	**Prepared By:** MCBCB PWD PRF5.1.2

PROJECT DESCRIPTION:

J-008-1 Fire Fighter Training Facilities

The project will construct four types of facilities: Enclosed fire fighter training tower, various fire fighter training mockups, to include fuel tanks to support fire training requirements, covered training area (observation/control tower) and a training course (Emergency Vehicle Operator Course (EVOC)), at Naval Support Activity (NSA), Marine Corps Base, Camp Blaz, Guam (MCBCB).

The first training facility is a six-story "enclosed fire fighter training" tower, which matches the height of the tallest Bachelor Enlisted Quarters (BEQs) on MCBCB, that consists of: reinforced and protected (including from extreme heat and fire) concrete structure with all components such as roof, walls, flooring, foundation, windows and doors (including openings made of concrete sills with bullnose corners). This fire simulation training tower will also include: repelling hooks on roof; a working elevator; approved search maze on ground floor with approved movable walls to create different scenarios, smoke machines to fill space; live-fire props (each on its own floor where each floor consists of one of these: kitchen, bedroom, living room and each floor has two means of egress); standpipe connections on each floor and/or in stairwell; enclosed stairwell all the way to the roof from ground floor; exterior ladders mounted on structure accessible from ground floor up to highest level; protective lining in burn room walls, doors & windows, ceilings; standpipe connections (Fire Department connection) outside tower for fire truck access; open head sprinklers in burn rooms (sprinkler connections outside); floor drains/scuppers on each room/floor; ceiling (typical false ceiling) and wall panels (drywall) in non-burn room to teach overhaul techniques in frame (so trainees can break these panels and replace) and heat source behind panels; windows opening (operating outward in burn rooms) in rooms; repelling safety net located at width of building side (connected to building and ground between second and third floors, horizontal; has a ladder on each side of the net); and entry hole floor with safety cover opening between all floors for confined space rescue operations; anchor points on the roof; and associated requirements. Project includes providing slip resistant surfaces at all stairs/steps and well-traveled paths.

The second type of training facility consists of eleven (11) fire fighter "training mockups" with flooring/slab and vehicle circulation from training area entry accesses to site surrounding each mockup, which will be constructed of reinforced concrete designed to withstand the heaviest vehicle/entity's weight accordingly. Existing structures, which are occupying the training area will be demolished to accommodate the new facilities. Facility #159 (Andresen Softball Field) and supporting facility (2 Duggout facilities), Facility # 161 (Restroom facility), Facility #159C (Announcers Booth) and associated utilities, poles, tennis courts, slabs, fence and

structures will be demolished. The eleven training mockups constructed per NFPA 1402 are 1) Roof Chop Trainer, 2) Vehicle Extraction Area, 3) Drafting Pit Area, 4) Horizontal Tank Live-fire Prop, 5) Automobile Live-fire Prop, 6) Dumpster Live-fire Prop, 7) Structural Collapse/Search & Rescue (SCR) Area, 8) Hazmat Containment/Decon Training Area, 9) Portable Fire-extinguisher Live-fire Prop, 10) Simulated Electrical Power Lines, and 11) Vertical Fuel Storage Tank Live-fire Prop.

The third facility is a "covered training area", which will be constructed per NFPA 1402 "Section 8.17 Observation/Control Tower", at the same training area, which provides the best observation of the training tower and mockups. It will be a two-story, air-conditioned structure consisting of reinforced and protected concrete, with all components such as exterior roof, walls, flooring, foundation, windows and doors (with electronic rollup/down storm/typhoon shutters with manual override), stairs enclosure(s), mechanical, electrical, plumbing, utilities, and information systems appropriate to Guam seismic, typhoon and tropical environmental conditions. On the second floor, the observation area will provide instructors and simulation controllers to observe and control all the training equipment and activities in the training area. This area will be used to monitor the entire training area and control the gas fuel, audio/video, communications, mechanical, electrical and related. All training and non-training related equipment/entities, will be managed in this observation area. The first floor of the watch tower includes restrooms with space for emergency eye-wash/shower unit for both genders; custodial; storage; adequate drinking water facilities; stairs enclosure(s); electrical/mechanical/fire alarm and associated spaces.

The fourth training facility is the six-acre "training course" called the EVOC, which will enable the base fire and rescue vehicle operators to improve and maintain their driving skills, in responding to fire and emergency situations, per NFPA 1402. As newer models of fire and emergency vehicles increase in size and weight, vehicle operators need to command the speed and maneuverability of their vehicles for safe and effective operations.

The status of J-008-1 Fire Fighter Training Facilities project and current site development plan are presented in **Table 1** and **Attachment 1**, respectively.

PROJECT EFFECTS TEST:

Resources of Primary Coastal Concern (note that none were determined to result in additional reasonably foreseeable spillover impacts from FC No. 2017-008, and all development are confined to lands under federal jurisdiction):

Terrestrial Habitat
No threatened and/or endangered species habitat is present within the project area.

Cultural Resources
There are no known historic properties affected by the J-008-1 Fire Fighter Training Facilities construction project per the 2015 Joint Region Marianas Integrated Cultural Resources Management Plan inventory. Regardless, and although unlikely to occur, each project shall comply with Appendices F and G of the 2011 Programmatic Agreement to protect any cultural resources discovered during construction. Also, PA Memos for the design and construction of this project shall be prepared and submitted to the Guam State Historic Preservation Office (SHPO) for effects to historical/cultural resources; memos can be found online at the

Department of Defense Cultural Resources Information website:
https://pacific.navfac.navy.mil/About-Us/Cultural-Resources-Information/

Water Quality
Although the entire J-008-1 Fire Fighter Training Facilities area occurs over the Northern Guam Lens Aquifer, the project will not be of sufficient scale to influence any surface water conveyance or injection wells to additionally affect coastal zone ground or surface water (marine) resources beyond impacts programmatically analyzed. It is unlikely that coastal zone drinking, or marine habitat water quality would be affected by silt from erosion, hazardous material spills and other pollution sources that may be generated as a result of project activities.

Construction design specifications for all projects reference the 2006 CNMI and Guam Stormwater Management Manual, and each vertical project is still required to implement a site-specific Stormwater Pollution Prevention Plan (SWPPP). Since the J-008-1 Fire Fighter Training Facilities is located within Guam EPA's Groundwater Management Protection Zone, certain facilities would be considered "Hot Spots" i.e. present risks to groundwater quality, hence these facilities' designs shall be in accordance with the 2010 BMPs for Wellhead Protection and will comply with Guam EPA's design review process, where the water/wastewater/stormwater system designs (where applicable) will require Guam EPA review and approval prior to construction. Any appropriate pretreatment of any discharge entering the sanitary sewer system shall be provided.

PROJECT COASTAL CONSISTENCY DETERMINATION:

The J-008-1 Fire Fighter Training Facilities vertical project may have direct and indirect coastal effects. The following Guam Coastal Management Policies were reviewed to ensure overall program consistency is maintained and to afford BSP streamlined review of borderline cases. The following are the specific assessments for each coastal policy:

Development Policy (DP) 1 (Shore Area Development): Development does not affect the Seashore Reserve.

DP2 (Urban Development): Area not subject to designations of the Land Use Districting Map.

DP3 (Rural Development): Area not subject to designations of the Land Use Districting Map.

DP4 (Major Facility Siting): Not a major facility (e.g. utilities, fuel and transportation facilities) subject to policy.

DP5 (Hazardous Areas): No development proposed in hazardous areas subject to policy.

DP6 (Housing): No housing projects are proposed.

DP7 (Transportation): No major transportation roadway networks proposed.

DP8 (Erosion and Siltation): The overall ground disturbance and larger plan of common development at the J-008-1 Fire Fighter Training Facilities is in an area of previous disturbance from the construction of NCTS Gym, Softball Field and Mini Golf recreational

facilities. J-008-1 Fire Fighter Training Facilities development, complies with the Navy's Low Impact Development (LID) policy and 2006 CNMI Guam Stormwater Manual, which sets a goal of no net increase in stormwater and sediment or nutrient loading from major renovation and construction projects.

Resource *Policy (RP) 1 (Air Quality)*: The minor air emission sources to be installed or built, as part of J-008-1 Fire Fighter Training Facilities project, are not anticipated to result in spillover coastal impacts to air quality. Regardless, all emission sources to be installed as part of each project (e.g. fuel-fired emergency generators, paint booths) will require a construction and operating permit per the Guam Air Pollution Control Standards and Regulations. Operational activities may impact air quality. MCBCB will obtain all necessary permits required for burning liquid propane or other fuels (wood fuels) needed for training.

RP2 (Water Quality): Reasonably foreseeable direct and indirect impacts to coastal zone water quality are not anticipated for J-008-1 Fire Fighter Training Facilities vertical construction project. The J-008-1 Fire Fighter Training Facilities project, will not be of sufficient scale to influence any surface water conveyance or injection wells to affect coastal zone ground or surface water (marine) resources.

RP3 (Fragile Areas): The proposed areas of development for J-008-1 Fire Fighter Training Facilities are entirely within previously disturbed areas. The Navy will still comply with the 2011 PA to protect cultural resources discovered during construction, and all applicable conservation measures (including 1000-acre forest enhancement) from the 2015 and 2017 BO shall be implemented accordingly. The 2015 Guam Micronesia Kingfisher Memorandum of Agreement designation of 5,234 acres of habitat to offset impacts of the Marine Corps Relocation remains in place.

RP4 (Living Marine Resources): No proposed activities affect the marine environment.

RP5 (Visual Quality): The J-008-1 Fire Fighter Training Facilities six story training tower is does not appreciably degrade visual resources along Route 3. The proposed infrastructure is similar to the training tower of the Astumbo fire station and is the same scale as the elevated NCTS water tanks along Route 3.

RP6 (Recreation Areas): Project do not propose to develop recreational facilities pertaining to the marine environment.

RP7 (Public Access): No impacts on public access.

RP8 (Agricultural Lands): No agricultural lands or activity in this area.

Coastal Determination: Although the J-008-1 Fire Fighter Training Facilities vertical project will have additive direct or indirect coastal effects, the Marine Corps Relocation Program remains consistent to the maximum extent practicable with Guam's enforceable coastal policies.

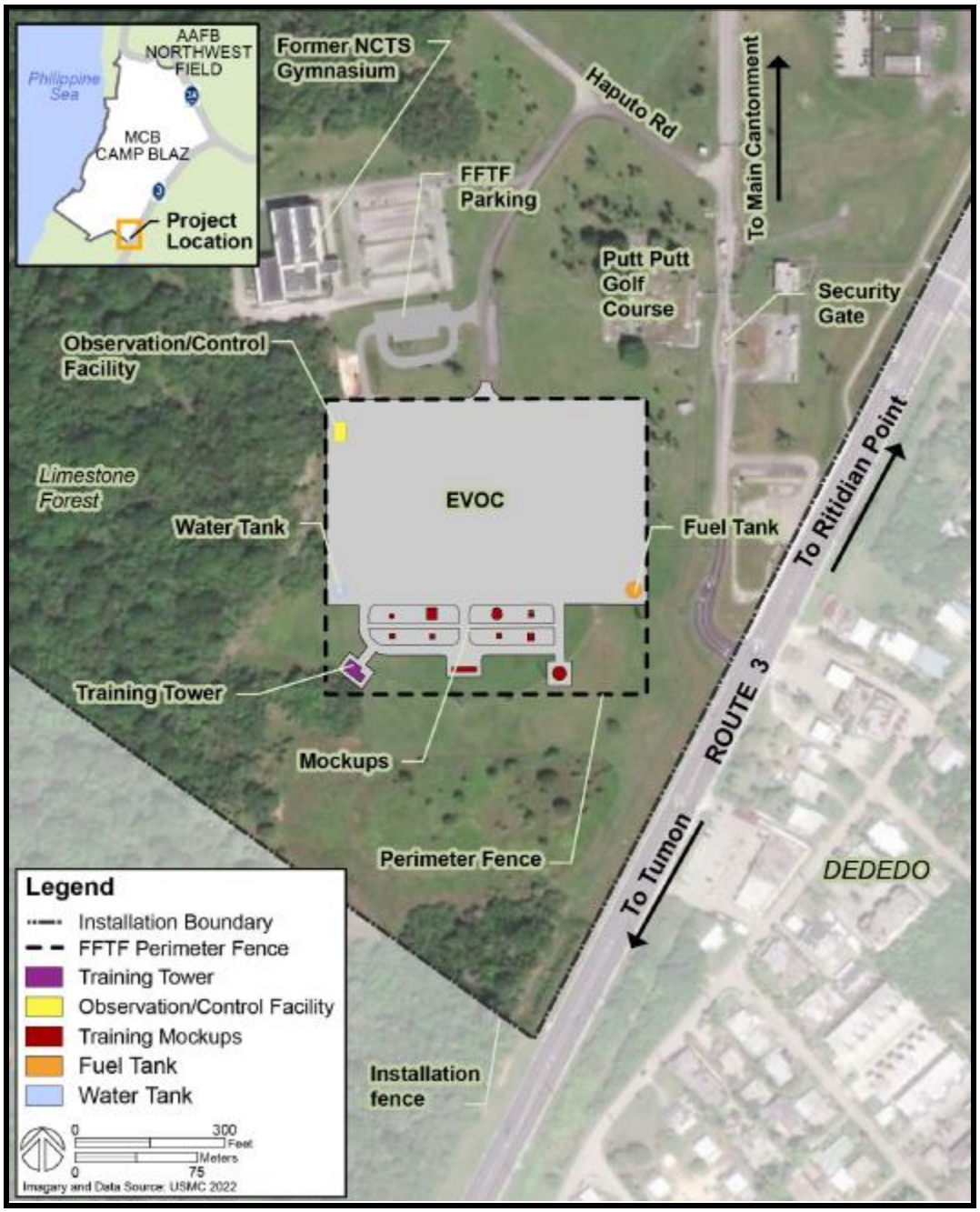
Table 1. Vertical Construction Projects at the Marine Corps Base Camp Blaz

Note: The J-008-1 Fire Fighter Training Facilities shall be updated with the Guam Coastal Management Program semiannually and as project information becomes available.

Project No.	Project Title	Status
J-008-1	Fire Fighter Training Facilities	Pending Award

Attachment 1. J-008-1 Fire Fighter Training Facilities Vertical Project, Marine Corps Base Camp Blaz

(Location/Site Map)



LOLA E. LEON GUERRERO
Director
MATTHEW C. SANTOS
Deputy Director

BUREAU OF STATISTICS AND PLANS
Guam Coastal Management Program

LOURDES A. LEON GUERRERO
Governor of Guam
JOSHUA F. TENORIO
Lieutenant Governor

FEB 2 0 2023

Albert Thomas T. Borja
Installation Environmental Program Director
United States Marine Corps
PSC 488 Box 105
FPO AP 96537-0149

RE: Coastal Zone Management Act (CZMA) Federal Consistency Review for United States Marine Corps' Phased Consistency Determination for its proposed Fiscal Year 2023 Marine Corps Base Camp Blaz (MCBCB) Vertical Construction Project: J-008-1, Dededo, Guam *(GCMP FC No. 2022-0030)*

Hafa adai! The Guam Coastal Management Program of the Bureau of Statistics and Plans (Bureau) has completed its review of the Phased Consistency Determination by the United States Marine Corps received on December 7, 2022. The United States Marine Corps ("the federal agency") has submitted its determination relative to the proposed Fiscal Year 2023 Marine Corps Base Camp Blaz (MCBCB) Vertical Construction Project: J-008-1, Dededo, Guam.

The Bureau coordinated this review with partnering agencies, provided Public Notice, and received comments from the Department of Agriculture (DOAG), the Guam Waterworks Authority (GWA), Guam Environmental Protection Agency (GEPA), and Prutehi Litekyan: Save Ritidian (PLSR). Furthermore, the Bureau hereby concurs with the federal agency's certification that the proposal is consistent with the enforceable policies of the Bureau's Guam Coastal Management Program (GCMP) based upon the following comments and conditions:

Resource Policy 2. Air Quality. *All activities and uses shall comply with all local air pollution regulations and all appropriate Federal air quality standards in order to ensure the maintenance of Guam's relatively high air quality.*

The federal agency represents:

> "The minor air emission sources to be installed or built, as part of J-008-1 Fire Fighter Training Facilities project, are not anticipated to result in spillover coastal impacts to air quality. Regardless, all emission sources to be installed as part of each project (e.g. fuel-fired emergency generators, paint booths) will require a construction and operating permit per the Guam Air Pollution Control Standards and Regulations. Operational activities may impact air quality. MCBCB will obtain all necessary permits required for burning liquid propane or other fuels (wood fuels) needed for training."

DOAG provided the following comment relative to air quality:

Limestone forest on the west of the proposed facility is used by the federally threatened Mariana fruit bat (*Pteropus mariannus*) for roost and foraging, Guam tree snail (*Partula radiolata*), Humped tree snail (*Partula gibba*), Fragile tree snail (*Samoana fragilis*), Mariana eight-spot butterfly (*Hypolimnas octocula marianensis*). Fire simulation exercises should mitigate impacts to these species that may occur. Smoke plumes may be a concern for these species during such training activity.

The construction phase of the project will result in localized and temporary impacts to air quality. Ground disturbing activity will occur which will result in the generation of fugitive dust, which may impact the limestone forest habitat. These impacts may be reduced by use of appropriate best management practices (BMPs), such as measures to reduce fugitive dust from storage piles, cover loads while materials are in transport, use of windbreaks, applying dust suppressants as appropriate, etc. Dust control measures shall be implemented and maintained throughout the duration of any activities, in accordance with Guam's Air Pollution Control Act (10 GCA Ch. 49) and regulations (22 GAR Div. 1 Ch. 1).

Pursuant to Resource Policy 2, Air Quality, the federal agency shall:

(1) ensure that fire simulation exercises should mitigate impacts to protected species that may occur. Advise DOAG Division of Aquatic and Wildlife Resources of measures that will be taken to mitigate impacts to protected species.
(2) implement and maintain dust control measures shall be implemented and maintained throughout the duration of any activities, in accordance with Guam's Air Pollution Control Act (10 GCA Ch. 49) and regulations (22 GAR Div. 1 Ch. 1).

Resource Policy 3. Water Quality. *Safe drinking water shall be assured and aquatic recreation sites shall be protected through the regulation of uses and discharges that pose a pollution threat to Guam's waters, particularly in estuarine, reef and aquifer areas.*

The federal agency represents:

"Reasonably foreseeable direct and indirect impacts to coastal zone water quality are not anticipated for J-008-1 Fire Fighter Training Facilities vertical construction project. The J-008-1 Fire Fighter Training Facilities project, will not be of sufficient scale to influence any surface water conveyance or injection wells to affect coastal zone ground or surface water (marine) resources."

GWA provided the following comments on the proposed project:

"1. Certain activities for the Fire Fighter Training Facilities are subject to sewer pre-treatment requirements during and post-construction. Various firefighter training mockups including a fire simulation and usage of fuel tanks needed to support training requirements are considered high-risk activities and contaminants from such activities must be prevented from entering into GWA's wastewater system or escaping to permeable ground surfaces where they may leach down to the groundwater table. A Pretreatment Permit for Significant Industrial Users from GWA will be required for wastewater discharge to the GWA sewer system. The applicant should consult with GWA's Source Control

Manager, Melissa Schaible at mschaible@guamwaterworks.org, for additional industrial wastewater pre-treatment requirements for discharge to the GWA wastewater collection system. Advanced coordination is highly recommended. An approved Pretreatment Industrial User Permit must be in place with any required pretreatment system completed at least six months prior to GWA accepting any wastewater from these facilities.

2. The Fire Fighter Training Facilities are located within Guam's EPA Groundwater Management Protection Zone, and certain activities may present a risk to groundwater quality. If firefighting foam is used for fire suppression, it must not contain any form of perfluoroalkyl and polyfluoroalkyl substances (PFAS) or any other potential emerging contaminant. Please provide a list of all chemicals that will be used as part of the training activities to GWA.

3. Preventative measures and best management practices must be incorporated into Standard Operating Procedures for the facility to ensure that oils, fuel, and other chemicals, do not enter into GWA's wastewater collection system. Only non-hazardous wastewater shall be discharged to the sanitary sewer system. Oil-water separators are required if vehicle maintenance activities will be conducted on site.

4. Stormwater is prohibited from being discharged into GWA's wastewater systems. Ensure that stormwater systems are adequately sized to prevent illicit discharges into GWA's wastewater system.

5. GWA requests the applicant provide the site development plans for each project for review for the proposed development, especially as such plans relate to the connection to GWA's wastewater collection system and could potentially affect treatment processes at the Northern District Wastewater Treatment Plant. The site development plans must illustrate the proposed point of connection to GWA's facilities, and such connection is subject to GWA inspection and approval. Submittals shall include the sewer design calculations and complete drawings and specifications. Design calculations shall include proposed water demand calculations including fire-flow, cross-connection control and sewer production calculations.

6. GWA requires the applicant to coordinate with the GWA Engineering Department to confirm the proposed sewer production calculations are consistent with GWA's wastewater treatment plant capacity and other permitting requirements.

7. Work with the GWA Permits Office to confirm the potable water source and wastewater discharge location, as well as the means of charging for GWA utility services."

The Fire Fighter Training Facilities are located above the Northern Guam Lens Aquifer. The Northern Guam Lens Aquifer is the sole source aquifer which is responsible for about 80% of drinking water for Guam. While located on federal land, the proposed activity would have coastal effects on the Northern Guam Lens Aquifer, both during the construction phase and during operation of the Fire Fighter Training Facilities.

GEPA stated that the project location is within Guam's Groundwater Protection Zone and, thus, the federal agency must comply with the Water Resources Management Regulations (22 GAR Div. 2 Ch. 7). Although the project site is outside of the wellhead protection zone (1,000 ft buffer) or GWA production well F-1 (nearly 1,300 ft distant) and F-7 (nearly 1,100 ft distant), the firefighting

training activities have the potential to impact the groundwater. The federal agency must provide assurance and preventive measures to the extent feasible, to GEPA that the firefighting training activity will not impact the groundwater.

GEPA cited provisions of the 2020 National Defense Authorization Act which bans or restricts the use of Aqueous Film Forming Foam (AFFF) and per- and polyfluoroalkyl substances (PFAS). The 2020 National Defense Authorization Act (NDAA) Sec. 323 states that AFFF, which is known to contain PFAS, may only be released for purposes of an emergency response or for training personnel or testing of equipment only if there is complete containment, capture and proper disposal mechanisms in place to ensure no AFFF is released into the environment. Sec. 324 prohibits the use of AFFF for training exercises at military installations, like that which will occur at the proposed facility. The Bureau urges strict adherence to Sec. 323 and 324 and requires under its Governmental Processes Policy that any AFFF usage or spill will be reported to GEPA to ensure improved coordination between territorial and federal agencies and access to essential data on the use of AFFF. NDAA Sec. 330 mandates appropriate disposal of per- and polyfluoroalkyl substances and AFFF.

GEPA states that the proposed fuel tank must be constructed in accordance with the Guam Hazardous Waste Management Regulations (22 GAR Div. 6 Ch. 30) and Guam Water Quality Standards (22 GAR Div. 2 Ch. 5) §5104, which set forth criteria and standards for the protection of Guam groundwater resources from potential threat from oil and hazardous materials discharge. The installation of the water tank and the water system must comply with the requirements of the Guam Safe Drinking Water Act (10 GCA Ch. 53). The plans and specifications for such systems must be submitted to GEPA for review and approval prior to the constructions, as required in the Act.

GEPA states that any work that disturbs the ground surface must meet all requirements of the Guam Soil Erosion and Sediment Control Regulations (22 GAR Ch. 10), and must provide both pre- and post-construction stormwater controls compliant with the requirements of the 2006 CNMI and Guam Stormwater Management Manual, as implemented by Executive Order No. 2012-02. Applicable best management practices (BMPs) shall be strictly implemented during the span of the construction period. Necessary measures must be taken by the contractor to prevent, control and mitigate the release of sediments, oils, trash/debris, and other pollutants to air, water and environment.

An Erosion and Sediment Control Plan (ECP) and Environmental Protection Plan (EPP) must be submitted for GEPA approval prior to the start of construction. Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and curtailment of work during adverse heavy rainfall events. Inspection and maintenance of containment devices shall be performed after adverse conditions.

The activities may, if not prevented, result in the release of oils, trash/debris, and other pollutants. Equipment used at the site use oils and other potential pollutants. Additional industry BMPs must

be taken by the contractor to prevent, control and mitigate the release of oils, trash/debris, and other pollutants to air, water and environment. Proper housekeeping must be practiced at all times. In order to avoid water quality impacts caused by construction activity, the contractor must ensure that equipment used at the project site is properly maintained and spill prevention kits are readily available.

PLSR raised concerns about the potential use of AFFF at the proposed project site and its potential to impact PFAS/PFOS levels in groundwater. PLSR discussed recent U.S. Environmental Protection Agency analyses which suggest a link between PFOA and PFOS exposure and negative health outcomes.

Pursuant to Resource Policy 3, Water Quality, the federal agency shall:

(1) comply with required sewer pre-treatment requirements during and post-construction. A Pre-Treatment Permit for Significant Industrial Users will be required for wastewater discharge into GWA's sewer system, six months prior to any discharge into the GWA wastewater system. Be advised to consult with GWA's Source Control Manager, Melissa Schaible mschaible@guamwaterworks.org for additional requirements.

(2) be advised that if firefighting foam is used for fire suppression, it should not contain any form of perfluoroalkyl and polyfluoroalkyl substances (PFAS) or any other potential emerging contaminant. Please provide a list of all chemicals that will be used as part of the training activities to GWA.

(3) incorporate preventative measures and best management practices into Standard Operating Procedures for the facility to ensure that oils, fuel, and other chemicals do not enter into GWA's wastewater collection system. Only non-hazardous wastewater shall be discharged to the sanitary sewer system. Oil-water separators are required if vehicle maintenance activities will be conducted on site.

(4) not discharge any stormwater into GWA's wastewater systems. Ensure that stormwater systems are adequately sized to prevent illicit discharges into GWA's wastewater system.

(5) provide the site development plans for each project for review for the proposed development, when such plans relate to the connection to GWA's wastewater collection system and could potentially affect treatment processes at the Northern Guam District Wastewater Treatment Plant. Such plans must illustrate the proposed point of connection to GWA's facilities and such connection is subject to GWA inspection and approval. Submittals shall include sewer design calculations and complete drawings and specifications. Design calculations shall include water demand calculations including fire-flow, cross connection control and sewer production calculations.

(6) coordinate with the GWA Engineering Department to confirm the proposed sewer production calculations are consistent with GWA's wastewater treatment plant capacity and other permitting requirements.

(7) coordinate with GWA's Permits Office to confirm the potable water source and wastewater discharge location, as well as the means of charging for GWA utility services.

(8) comply with the Water Resources Management Regulations (22 GAR Div. 2 Ch. 7)

(9) provide assurance and preventive measures to the extent feasible, to GEPA that the firefighting training activity will not impact the groundwater, as, despite the project site being outside of the wellhead protection zone for production wells F-1 and F-7, the firefighting training activities have the potential to impact the groundwater.

(10) be urged to strictly comply with the provisions of NDAA Sec. 323, 324, and 330 on not acquiring or using AFFF except as authorized in those sections and the proper disposal of PFAS and AFFF used, if any, at or in connection with the firefighter training facility.

(11) report any usage or spill of AFFF to GEPA, in accordance with the Government Processes Policy enacted in Exec. Order 78-37 to ensure improved coordination between territorial and federal agencies and access to essential data on the use of AFFF.

(12) construct the proposed fuel tank in accordance with the Guam Hazardous Waste Management Regulations (22 GAR Div. 6 Ch. 30) and Guam Water Quality Standards (22 GAR Div. 2 Ch. 5) §5104, which set forth criteria and standards for the protection of Guam groundwater resources from potential threat from oil and hazardous materials discharge.

(13) install the water tank and the water system in compliance with the requirements of the Guam Safe Drinking Water Act (10 GCA Ch. 53). The plans and specifications for such systems must be submitted to GEPA for review and approval prior to the constructions, as required in the Act.

(14) meet all the requirements of the Guam Soil Erosion and Sediment Control Regulations (22 GAR Ch. 10) for all work that disturbs the ground surface and provide both pre- and post-construction stormwater controls compliant with the requirements of the 2006 CNMI and Guam Stormwater Management Manual, as implemented by Exec. Order 2012-02. Applicable BMPs shall be strictly implemented during the span of the construction period. Necessary measures must be taken by the contractor to prevent, control and mitigate the release of sediments, oils, trash/debris, and other pollutants to air, water and environment.

(15) submit an Erosion and Sediment Control Plan (ECP) and Environmental Protection Plan (EPP) for GEPA approval prior to the start of construction. Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and curtailment of work during adverse heavy rainfall events. Inspection and maintenance of containment devices shall be performed after adverse conditions.

(16) ensure that equipment used at the project site will not cause oil leaks, and spill prevention kit(s) must be readily available onsite. Proper housekeeping must also be strictly implemented to circumvent the transport of contaminants by stormwater runoff such as pollutant spills into the ground and/or pollutant impacts to water quality in the area.

Resource Policy 4. Fragile Areas. *Development in the following types of fragile areas shall be regulated to protect their unique character: historic and archeological sites, wildlife habitats, pristine marine and terrestrial communities, Limestone forests, and mangrove stands and other wetlands.*

The federal agency represents:

> "The proposed areas of development for J-008-1 Fire Fighter Training Facilities are entirely within previously disturbed areas. The Navy will still comply with the 2011 PA to protect cultural resources discovered during construction, and all applicable conservation measures (including 1000-acre forest enhancement) from the 2015 and 2017 BO shall be implemented accordingly. The 2015 Guam Micronesia Kingfisher Memorandum of Agreement designation of 5,234 acres of habitat to offset impacts of the Marine Corps Relocation remains in place."

DOAG provided the following comment relative to fragile areas:

> The two habitat types near the proposed facility include the limestone forest and the open field (mowed grass fields). Between August and May, migratory birds (protected under the federal Migratory Bird Treaty Act) are known to occupy mowed grass fields. Mitigative actions must be established and implemented to avoid any harm to these species during field exercises/training at the proposed project area.

Based upon the location/site map provided by the federal agency to the Bureau, the proposed project would result in loss of limestone forest. The proposed Perimeter Fence, the Training Tower, and the Emergency Vehicle Operator Course each encroach onto the existing limestone forest, which is a habitat for a number of threatened and endangered species, as discussed by DOAG in their comment on Air Quality. It is recommended that the area of this loss be determined, provided to DOAG and the Bureau, and that an appropriate limestone forest mitigation be implemented in the surrounding area, using displaced vegetation, to the extent feasible. A mitigation ratio of considerably greater than 1:1 would help to ensure that even with a lower survival rate of transplanted species, the action would not result in a net decrease in affected habitat.

Pursuant to Resource Policy 4, Fragile Areas, the federal agency shall:

(1) Establish and implement mitigation actions to avoid harm to protected species, including migratory birds during field exercises/training at the proposed project area. Advise DOAG Division of Aquatic and Wildlife Resources of actions that will be taken to mitigate impacts to protected species.
(2) be advised to avoid encroachment onto the limestone forest by the Perimeter Fence, the Training Tower, and the Emergency Vehicle Operator Course.
(3) provide DOAG and the Bureau with an estimate of the area of limestone forest that will be lost in the proposed project.
(4) be advised to devise an appropriate mitigation for the limestone forest habitat, using displaced vegetation, or other native plants to the extent feasible. A mitigation ratio of considerably greater than 1:1 would help to ensure that even with a lower survival rate of transplanted species, the action would not result in a net decrease in affected habitat.

(5) provide DOAG and the Bureau with a plan for mitigation, should the federal agency plan to implement an appropriate limestone forest mitigation.

Resource Policy 6. Visual Quality. *Preservation and enhancement of, and respect for the island's scenic resources shall be encouraged through increased enforcement of and compliance with sign, litter, zoning, subdivision, building and related land-use laws. Visually objectionable uses shall be located to the maximum extent practicable so as not to degrade significant views from scenic overlooks, highways and trails.*

The federal agency represents:

> "The J-008-1 Fire Fighter Training Facilities six story training tower does not appreciably degrade visual resources along Route 3. The proposed infrastructure is similar to the training tower of the Astumbo fire station and is the same scale as the elevated NCTS water tanks along Route 3."

The developer is responsible for compliance with all relevant Guam EPA regulations related to the disposal of demolition and construction debris. In the event that demolition materials and/or construction debris are determined to be hazardous, the contractor must notify or coordinate with Guam EPA's Hazardous Waste Program for guidance and proper disposal.

The current site is composed largely of open space, tennis courts, and a baseball field, in addition to a few single-story buildings which are at least 250 feet from Route 3, which is a significant highway on Guam. The mockup facilities would largely be in line with existing uses visually, but the placement of the fuel tank and training tower would visually degrade the area, which is near civilian commercial spaces which serve the general public. The military development projects have cumulatively degraded the visual quality on the western side of Route 3. It is recommended that native tree plantings be made between Route 3 and the perimeter fence of the proposed Fire Fighter Training Facilities.

Pursuant to Resource Policy 6, Visual Quality, the federal agency shall:

(1) be responsible for compliance with all relevant Guam EPA regulations related to the disposal of demolition and construction debris.
(2) notify or coordinate with Guam EPA's Hazardous Waste Program for guidance and proper disposal if demolition materials and/or construction debris are determined to be hazardous.
(3) be advised to plant native trees between Route 3 and the perimeter fence of the proposed Fire Fighter Training Facilities.

Therefore, based on the conditional concurrence stated above and the Bureau's review of all other information submitted, we find the application to be consistent with the approved development and resource policies of the Guam Coastal Management Program (GCMP), in accordance with the Coastal Zone Management Act of 1972, (P.L. 92-583) as amended, (P.L. 94-370). The Federal Consistency concurrence, however, does not preclude the need for securing other federal and Government of Guam permits, clearances and approvals prior to the start of this project.

Per 15 CFR §930.4(b), if the requirements for conditional concurrences specified in 15 CFR §930.4(a), (1) through (3), are not met, then all parties shall treat this conditional concurrence letter as an objection pursuant to 15 CFR Part 930 subpart C. Furthermore, if an objection is determined, you are hereby notified that, pursuant to 15 CFR §930.63(e) and 15 CFR Part 930, subpart H, you have the opportunity to appeal an objection resulting from not meeting the requirements of 15 CFR §930.4(a), (1) through (3), to the Secretary of Commerce within 30 days after receiving this conditional concurrence letter.

The proposed action shall be operated and completed as represented in the Coastal Zone Management (CZM) federal consistency certification. Significant changes to the subject proposal shall be submitted to the Bureau for review and approval and may require a full CZM federal consistency review, including publication of a public notice and provision for public review and comment. This condition is necessary to ensure that the proposed actions are implemented as reviewed for consistency with the enforceable policies of GCMP. Guam Land Use policies (E.O. 78-37), are the federally approved enforceable policies of GCMP that applies to this condition.

Please do not hesitate to contact Mr. Julian Janssen, Federal Activities Planner at 671-475-9664 or email julian.janssen@bsp.guam.gov or Mr. Edwin Reyes, Coastal Program Administrator at 671-475-9672 or email edwin.reyes@bsp.guam.gov. Si Yu'os Ma'åse'.

Sincerely,

LOLA E. LEON GUERRERO
Director

Attachments

Cc: NOAA-OCM
DOAG
DLM
DPR
DPW
GEPA
GWA

Lourdes A. Leon Guerrero
Governor
Joshua F. Tenorio
Lt. Governor

Guam Department of Agriculture
Dipåttamenton Agrikotturan Guåhan
163 Dairy Road, Mangilao, Guam 96913

Chelsa Muña-Brecht
Director

MEMORANDUM

To: Lola Leon Guerrero, Director
Bureau of Statistics and Plans

From: Chelsa Muña-Brecht, Director Chelsa Muna-Brecht Digitally signed by Chelsa Muna-Brecht Date: 2023.01.17 11:44:24 +10'00'

Date: January 17, 2023

SUBJECT: **Federal Consistency Review: U.S. Marine Corps' Phased Consistency Determination for its proposed Fiscal Year 2023 Marine Corps Base Camp Blaz (MCBCB) Vertical Construction Project: Fire Fighting Training Facilities (J-008-1), at Camp Blaz, Dededo (GCMP FC 2022-0030)**

Hafa adai!

The Department of Agriculture (DOAG) has reviewed MCBCB's request for Consistency for its proposed fire-fighting training facilities (J-008-1) project at Camp Blaz, Dededo. The project will construct four types of facilities: Enclosed fire fighter training tower, various firefighting mockups, to include fuel tanks to support fire training requirements, covered training area (observation/control tower) and a training course (Emergency Vehicle Operator Course).

DOAG submits the following statements for policies related to its authorities, to be addressed for Federal Consistency Determination:

RP 2. Air Quality

Limestone forest on the west of the proposed facility is used by the federally threatened Mariana fruit bat (*Pteropus mariannus*) for roost and foraging, Guam tree snail (*Partula radiolata*), Humped tree snail (*Partula gibba*), Fragile tree snail (*Samoana fragilis*), Mariana eight-spot butterfly (*Hypolimnas octocula marianensis*). Fire stimulation exercises should mitigate impacts to these species that may occur. Smoke plumes may be a concern for these species during such training activity.

RP 4. Fragile Areas

The two habitat types near the proposed facility includes the limestone forest and the open field (mowed grass fields). Between August and May, migratory birds (protected under the federal Migratory Bird Treaty Act) are known to occupy mowed grass fields. Mitigative actions must be established and implemented to avoid any harm to these species during field exercises/training at the proposed project area.

If you have any concerns please contact Mr. Jeffrey Quitugua at Jeffrey.Quitugua@doag.guam.gov or permits@doag.guam.gov.

GUAM WATERWORKS AUTHORITY
"Better Water. Better Lives."
Gloria B. Nelson Public Service Building | 688 Route 15, Mangilao, Guam 96913
P.O. Box 3010, Hagåtña, Guam 96932
Tel. No. (671) 300-6846/48 Fax No. (671) 648-3290

January 25, 2023

Ms. Lola E. Leon Guerrero
Director
Bureau of Statistics and Plans
Sagan Planu Siha Yan Emfotmasion
P.O. Box 2950
Hagåtña, Guam 96932

Subject: Federal Consistency Review: U.S. Marine Corp's Phase Consistency Determination for the proposed Fiscal Year 2023 Marine Corps Base Camp Blaz (MCBCB) Vertical Construction Project: Fire Fighter Training Facilities (J-008-1), at Camp Blaz, Dededo (GCMP FC 2022-0030)

Håfa Adai Ms. Leon Guerrero,

The Guam Waterworks Authority (GWA) has reviewed the Federal Consistency application and has the following comments:

1. Certain activities for the Fire Fighter Training Facilities are subject to sewer pre-treatment requirements during and post-construction. Various firefighter training mockups including a fire simulation and usage of fuel tanks needed to support training requirements are considered high-risk activities and contaminants from such activities must be prevented from entering into GWA's wastewater system or escaping to permeable ground surfaces where they may leach down to the groundwater table. A Pretreatment Permit for Significant Industrial Users from GWA will be required for wastewater discharge to the GWA sewer system. The applicant should consult with GWA's Source Control Manager, Melissa Schaible at mschaible@guamwaterworks.org, for additional industrial wastewater pre-treatment requirements for discharge to the GWA wastewater collection system. Advanced coordination is highly recommended. An approved Pretreatment Industrial User Permit must be in place with any required pretreatment system completed at least six months prior to GWA accepting any wastewater from these facilities.

2. The Fire Fighter Training Facilities are located within Guam's EPA Groundwater Management Protection Zone, and certain activities may present a risk to groundwater quality. If firefighting foam is used for fire suppression, it must not contain any form of perfluoroalkyl and polyfluoroalkyl substances (PFAS) or any other potential emerging contaminant. Please provide a list of all chemicals that will be used as part of the training activities to GWA.

3. Preventative measures and best management practices must be incorporated into Standard Operating Procedures for the facility to ensure that oils, fuel, and other

chemicals, do not enter into GWA's wastewater collection system. Only non-hazardous wastewater shall be discharged to the sanitary sewer system. Oil-water separators are required if vehicle maintenance activities will be conducted on site.

4. Stormwater is prohibited from being discharged into GWA's wastewater systems. Ensure that stormwater systems are adequately sized to prevent illicit discharges into GWA's wastewater system.

5. GWA requests the applicant provide the site development plans for each project for review for the proposed development, especially as such plans relate to the connection to GWA's wastewater collection system and could potentially affect treatment processes at the Northern District Wastewater Treatment Plant. The site development plans must illustrate the proposed point of connection to GWA's facilities, and such connection is subject to GWA inspection and approval. Submittals shall include the sewer design calculations and complete drawings and specifications. Design calculations shall include proposed water demand calculations including fire-flow, cross-connection control and sewer production calculations.

6. GWA requires the applicant to coordinate with the GWA Engineering Department to confirm the proposed sewer production calculations are consistent with GWA's wastewater treatment plant capacity and other permitting requirements.

7. Work with the GWA Permits Office to confirm the potable water source and wastewater discharge location, as well as the means of charging for GWA utility services.

If you have any questions or comments, please feel free to contact Paul Kemp, Assistant General Manager of Compliance and Safety at paulkemp@guamwaterworks.org.

Sincerely,

Miguel C. Bordallo, P.E
General Manager

CC: Thomas A. Cruz, P.E. Assistant General Manager Operations
Paul Kemp, Assistant General Manager, Compliance and Safety
Mauryn McDonald, P.E. Acting Assistant General Manager Engineering
Melissa Schaible, Source Control Manager

MCB/edl

GUAM ENVIRONMENTAL PROTECTION AGENCY • *AHENSIAN PRUTEKSIÓN LINA'LA' GUÅHAN*
LOURDES A. LEON GUERRERO • GOVERNOR OF GUAM | JOSHUA F. TENORIO • LIEUTENANT GOVERNOR OF GUAM
WALTER S. LEON GUERRERO • ADMINISTRATOR | MICHELLE C. R. LASTIMOZA • DEPUTY ADMINISTRATOR

FEB 0 9 2023

MEMORANDUM

TO: **Director, Bureau of Statistics and Plans**

FROM: **Administrator**

SUBJECT: **GEPA 2023-0420 – DoD Fire Fighting Training Facilities, Camp Blas (FCR 2022-0030)**

Buenas yan Saluda. The Guam Environmental Protection Agency (GEPA) has reviewed the above referenced project and provides comments as part of the Federal Consistency application submitted to the Bureau of Statistics and Plans (BSP) by the Department of Defense. The proposed project as described includes the construction of firefighting training facilities and various support buildings.

The GEPA staff has reviewed the submitted documents and determined that the proposed project when properly executed, is not likely to have any significant impact to the environment. GEPA stresses the importance of protecting our environment and offers the following comments and recommendations:

SPECIFIC COMMENT

1. The project location is within the Guam Water Protection Zone and the requirements of the 22GAR7, Water Resources Management Regulations, must be complied with for the protection of the water resource zone.
2. Although the project site is outside of the wellhead protection zone (1,000ft) of GWA production well F-1 (1,300ft) and F-7 (1,100ft), the firefighting training activities have the potential to impact the groundwater. The DoD must provide assurance and preventive measures to the extent feasible, to GEPA that firefighting training activity will not impact the groundwater.
3. GEPA requires that the Department of Defense (DoD) strictly adheres to Section 323 of the fiscal year 2020 National Defense Authorization Action (NDAA), which states that Aqueous Film Forming Foam (AFFF), known to contain per- and polyfluoroalkyl substances (PFAS), will **NOT** be used for training personnel or testing of equipment unless there are complete containment, capture and proper disposal mechanisms in place to ensure no AFFF is released into the environment.

4. GEPA requires that the DoD report **ANY** AFFF usage, or spill to the Agency, not just the volume and concentration indicated in Section 318 of the fiscal year 2020 NDAA.
5. GEPA requires that DoD adhere to the fiscal year 2020 NDAA requirement to stop purchasing PFAS-based foam by October 1, 2023, and stop using them entirely by October 1, 2024
6. PFAS-based foams may be used for EMERGENCY purposes only, but the release must be treated as a spill and follow all existing spill response plans and procedures to contain and recover AFFF to the extent practicable.
7. The proposed fuel tank must be constructed in accordance with the Guam Hazardous Waste Regulations and Guam Water Quality Standards (22GAR5) Section 5104; criteria and standards for the protection of the Guam groundwater resources from potential treat from oil and hazardous materials discharge.
8. The installation of the water tank and the water system must comply with the requirements of the 10GCA 53; Guam Safe Drinking Water Act. The plans and specifications must be submitted to the Agency for review and approval prior to construction, as per the requirement of the Act.

GENERAL COMMENTS

A. Stormwater and Erosion Control

1. Any work that disturbs the ground surface must meet all requirements of the Guam Soil Erosion and Sediment Control Regulations (22 GAR Chapter 10), and must provide both pre- and post-construction stormwater controls compliant with the requirements of the 2006 CNMI and Guam Stormwater Management Manual, as implemented by Executive Order No. 2012-02.
2. Applicable BMP's shall be strictly implemented during the span of the construction period. Necessary measures must be taken by the contractor to prevent, control and mitigate the release of sediments, oils, trash/debris, and other pollutants to air, water and environment.
3. An Erosion and Sediment Control Plan (ECP) and Environmental Protection Plan (EPP) must be submitted for GEPA approval prior to the start of construction. Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and curtailment of work during adverse heavy rainfall events. Inspection and maintenance of containment devices shall be performed after adverse conditions.

B. Solid Waste

1. The developer is responsible for compliance with all relevant Guam EPA regulations related to the disposal of demolition and construction debris.
2. In the event that demolition materials and/or construction debris are determined to be hazardous, the contractor must notify or coordinate with Guam EPA's Hazardous Waste Program for guidance and proper disposal.

C. Air Quality

1. Dust control measures shall be implemented and maintained throughout the duration of any activities, in accordance with the Guam Air Pollution Control Standards and Regulations (10 GCA 49).
2. The contractor must minimize construction related noise impact by limiting construction related activities during night time.

D. Water Quality

1. To avoid water quality impacts caused by construction activity, the contractor must ensure that equipment used at the project site will not cause oil leaks, and spill prevention kit(s) must be readily available onsite. Proper housekeeping must also be strictly implemented to circumvent the transport of contaminants by stormwater runoff such as pollutant spills into the ground and/or pollutant impacts to water quality in the area.

Should you have any questions and/or need additional information, please do not hesitate to contact the staff at Water Pollution Control Program, or the Non-point Source Program at tel. 671-300-4781 and 671-300-4787 respectively.

Dångkolu na si Yu'us ma'åse'.

Senseramente,

WALTER S. LEON GUERRERO
Administrator

Prutehi Litekyan - Save Ritidian
A Direct-Action Group
Email: litekyan.opa@gmail.com

January 20, 2023

Julian Janssen
Bureau of Statistics and Plans
Guam Coastal Zone Management Program
Government of Guam

Via Email – julian.janssen@bsp.guam.gov

Project: Fiscal Year 2023 Camp Blaz Vertical Construction Project: J-008-1 Fire Fighting Training Facilities

Subject: Coastal Zone Management Federal Consistency Comments

Håfa Adai Mr. Janssen:

We thank you for the opportunity to comment on the Effect Test and Determination Under the Coastal Zone Management Act for Naval Facilities Engineering Command (NAVFAC) Fiscal Year 2023 Camp Blaz Vertical Construction Projects: J-008-1 Fire Fighting Training Facilities.

Established in 2017, Prutehi Litekyan Save Ritidian (PLSR) is a community-based organization dedicated to protecting and preserving the natural and cultural resources of Guam. This includes the areas proposed to be used for relocating U.S. Marine Corps forces currently located in Okinawa, Japan to Guam, and for military live-fire training. PLSR's members and network (collectively referred to as "members") comprise of the indigenous CHamoru, the residents of Guam, allies, and concerned citizens with the interest of protecting the beliefs, the culture, the language, the air, the water, and the land of the CHamoru. More specifically, PLSR's members comprise of Yo'åmte (traditional healers), fishermen, businesspeople, college students, farmers, teachers, social workers, cultural practitioners, and environmentalists.

PLSR represents its members, in addition to over 25,000 petition signatories, by actively engaging in the legislative, administrative processes and has consistently demonstrated a special interest in the areas of controversy. "Since its inception, PLSR has organized more than 500 different actions including letter-writing campaigns, meetings with government agencies, school visits, comment drives, protests, tours, press conferences, legislative roundtables, meetings with military officials, public hearings, election surveys, media interviews, podcasts, webinars, and other efforts to raise public awareness." PLSR's advocacy efforts were recognized internationally: on March 30, 2021, the United Nations Human Rights Council acknowledged

human rights violations by the U.S. military against the CHamoru people, as provided in PLSR's petition to United Nations.

Accordingly, PLSR and its members have a direct interest in ensuring that federal actions and decisions do not harm or have a potential to harm cultural resources, historical properties, and natural resources of the indigenous CHamoru people and the larger Guam community. These interests extend to environmental resources that could constitute as a historic property, including sources of water and water bodies. DoD's environmental review in connection with actions and decisions that inadequately consider the effect of their undertaking on cultural resources would impair PLSR's interests.

As part of its environmental review, NAVFAC's submissions of Effect Test and Determination Under the Coastal Zone Management Act —if deemed procedurally or substantively flawed— may further injure PLSR's interests. Thus, PLSR and its members have a significant interest in ensuring that PLSR and its members have public access to information and appropriate supporting documentation regarding DoD's identification and evaluation efforts and findings, to provide the public opportunities to comment.

Additionally, PLSR has made public serious concerns about the protection of our coastline and Northern Lens Aquifer. Our organization has received and continues to receive multiple calls from community members requesting that PLSR investigate issues of erosion, storm water run-off, and contamination at the construction site listed in this notice.

On behalf of Prutehi Litekyan: Save Ritidian ("PLSR"), we respectfully submit these comments **opposing the Effect Test and Determination Under the Coastal Zone Management Act** for the project listed above for the reasons:

1. The proposed actions within J-008-1 Fire Fighting Training Facilities must be measured against the longstanding history of military contamination in Guam and the serious threat of PFAS/PFOS contamination we continue to face. At least 2 wells in the military water system have been taken offline due to PFAS contamination, NRMC-1 and NRMC-2 located in central Guam *(2021 US Navy System Quality Report PWS ID: GU0000010, NAV FAC MARIANAS)*. Despite being shut down, the Navy continues to report steady increases and high levels of the "forever chemicals" at these same wells. These two wells and other contamination sites within the Navy Base and Andersen Air Force Base (https://www.ewg.org/interactive-maps/pfas_contamination/) are directly related to similar training activities as outlined in this submission. Some of this contamination is directly linked to the use of Aqueous Film Forming Foam (AFFF) and other hazardous chemicals at sites used for fire-fighting training. Similar training sites may already exist within the bases and PLSR is opposed to this new training site as well as the increased of military training exercises that harm our environment, groundwater, and coastline. This new site J-008-1 Fire Fighting Training Facilities poses a tremendous threat to the Guam Northern Lens Aquifer as Aqueous Film Forming Foam (AFFF) and other hazardous chemicals will be used throughout the 6-acre project area including the training tower,

the mockup training area, the covered area. The submission is void of any description of hazardous chemicals that will be used or stored at the training facility. The submission does not discuss the associated environmental and health risks and appears to have not been assessed through the NEPA process. Additionally, issues of erosion, soil stabilization and sediment control associated with the project will pose threats to the Guam Northern Lens Aquifer.

2. Throughout the world, rates of PFAS contamination have been drastically underestimated. These "forever chemicals" do not breakdown in the natural environment, travel through ground water, and bio accumulate in soil, plants, animals, and people. New data and draft EPA analyses indicate that the levels at which negative health outcomes could occur with from PFOA and PFOS exposure are much lower than previously understood. US EPA has reduced the level of lifetime exposure from 7 parts per trillion to 0.004 parts per trillion for PFOA and 0.002 parts per trillion for PFOS. Minimum reporting levels are reduced from 7 to 4. Human studies have found associations between PFOA and/or PFOS exposure and effects on the immune system (specifically reduced immunity in children), the cardiovascular system, development (e.g., decreased birth weight), cancer, and more (https://www.epa.gov/newsreleases/epa-announces-new-drinking-water-health-advisories-pfas-chemicals-1-billion-bipartisan).

3. NAVFAC mentions "discernable spillover (indirect and cumulative impacts)" associated with these proposed projects, but fails to provide any analysis of what the impacts are. They state, "Although the J-008-1 Fire Fighter Training Facilities vertical project will have additive direct or indirect coastal effects, the Marine Corps Relocation Program remains consistent to the maximum extent practicable with Guam's enforceable coastal policies." This description is a complete lack of transparency in informing about the impacts. Disclosing information is necessary to provide the public opportunities to comment and NAVFAC in its submission does not disclose much of the information necessary to make a proper analysis. NAVFAC fails to make the supporting materials publicly accessible for this massive undertaking. Therefore, the commenting process is flawed given that the public is unable to provide thorough comments without the necessary resources to review.

4. The submission assumes without any explanation or evidence provided that although the entire J-008-1 Fire Fighter Training Facilities area occurs over the Northern Guam Lens Aquifer, the project will not be of sufficient scale to influence any surface water conveyance or injection wells to additionally affect coastal zone ground or surface water (marine) resources beyond impacts programmatically analyzed. The submission asserts that it is unlikely that coastal zone drinking, or marine habitat water quality would be affected by silt from erosion, hazardous material spills and other pollution sources that may be generated as a result of project activities. This blanket statement is extremely problematic as erosion and runoff is an enduring issue throughout all sites of military construction and operation. Additionally, the submission makes mention of "hot spots"

that present risks to groundwater but does not identify any of the "hot spots", their existing conditions, or design details or methods for prevention or mitigation of these "hotspots." Therefore, the submission should be rejected and resubmitted.

5. There are no emission controls identified for air quality whatsoever. The description of "minor" emissions appears unqualified and inaccurate.

6. NAVFAC in its submission, inadequately identifies the area as one that is not fragile as is has been previously disturbed. Many previously disturbed sites are still fragile sites.

Once again, the proposed actions within J-008-1 Fire Fighting Training Facilities must be measured against the legacy of military contamination and environmental racism in Guam and the serious threat of PFAS/PFOS contamination we continue to face. Our community continues to witness serious problems with erosion and storm water run-off at sites of military construction that can harm our Northern Lens Aquifer and vital coastal resources. For these reasons, we object to the NAVFAC submission for J-008-1 Fire Fighter Training Facilities to the Guam Coastal Zone Management Program. Thank you and Si Yu'os Ma'åse'.

Sincerely,

Monaeka Flores, PLSR Core Member

CC: Jessica Nangauta, PLSR Chairperson
Rachel Ayuyu, Attorney
Steven Dierking, BSP CZM
Edwin Reyes, BSP CZM

UNITED STATES MARINE CORPS
MARINE CORPS BASE CAMP BLAZ
PSC 488 BOX 105
FPO AP 96537-0149

April 05, 2023

Ms. Lola Leon Guerrero
Director
Guam Bureau of Statistics and Plans
P.O. Box 2950
Hagåtña, Guam 96932

Hafa Adai, Ms. Leon Guerrero:

SUBJECT: ACKNOWLEDGEMENT OF GUAM COASTAL MANAGEMENT PROGRAM FEDERAL CONSISTENCY REVIEW NO. 2022-0030: FISCAL YEAR 2023 MARINE CORPS BASE CAMP BLAZ (MCBCB) VERTICAL CONSTRUCTION PROJECT: J-008-1, DEDEDO, GUAM

We would like to express our appreciation to the Guam Coastal Management Program for its Federal Consistency Review, Phased Consistency Determination, Vertical Construction Project: J-008-1, Dededo, Guam (GCMP FC No. 2022-0030). We greatly appreciate the comments submitted by Department of Agriculture, Guam Waterworks Authority, Guam Environmental Protection Agency, and Prutehi Litekyan.

Marine Corps Base Camp Blaz has always considered the federal consistency process a vital tool to ensure collaboration with federal and local partners as well as transparency with the public. We accept and will comply with enforceable conditions and are so advised for those items stated as recommendations. We will integrate those conditions directly applicable to design and construction into the J-008-1 Draft Environmental Assessment that will be published for a 30-day public review period in the near future.

We look forward to our continued coordination in support of Marine Corps Base Camp Blaz firefighter training and readiness. Should you have any questions or concerns please contact Mr. Rick Salas, Environmental Planner, at (671) 362-7204 or richard.c.salas@usmc.mil.

Senseramente,

Digitally signed by
BORJA.ALBERT.T.128
3962918
Date: 2023.04.05
17:50:04 +10'00'

Albert Thomas T. Borja
Installation Environmental Program Director
By Direction of the Commanding Officer

RECEIVED
APR 06 2023
1:34pm
BUREAU OF
STATISTICS AND PLANS

Appendix D
Air Quality and Greenhouse Gas Emissions Methodology and Calculations

This page intentionally left blank.

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 1

1. General Information

- Action Location

State: Guam
County(s): Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Firefighter Training Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2024

- Action Purpose and Need:

The purpose of the Proposed Action is to provide facilities at MCB Camp Blaz for Fire Department personnel and mutual aid partners to meet Commander, Navy Installation Command mandatory training and certification requirements in order to perform their duties to protect lives and property.

The Proposed Action is needed because there are currently no Firefighter training facilities on the island of Guam that are compliant with Commander, Navy Installations Command (CNIC) requirements for multistory firefighting training facilities. Several six-story bachelor enlisted quarters (BEQs) are currently being constructed at MCB Camp Blaz, and MCB Camp Blaz Firefighters will be required to train on a multistory training facility of a similar height to meet their mandatory training and certification requirements.

- Action Description:

Marine Corps Base (MCB) Camp Blaz, proposes to construct and operate an FFTF at MCB Camp Blaz to support the Fire Department staff meeting their mandatory annual training and certification requirements. The Proposed Action would consist of four training facilities: an emergency vehicle operator course (EVOC), a six-story enclosed Firefighter training tower, Firefighter training mockups, and a covered observation/control facility. Construction of the Proposed Action would require the demolition of any existing facilities at the chosen alternative project site. Construction is proposed to begin in fiscal year (FY) 2024.

Alternative 1 (Preferred Alternative) would involve construction and operation of the FFTF on an approximately eight-acre parcel at the south end of MCB Camp Blaz on the Andreen Softball field. The site is within the MCB Camp Blaz installation boundary, adjacent to the existing MCB Camp Blaz security gate. The existing softball field and the adjacent tennis courts would be demolished. New utility lines would be constructed to connect the proposed FFTF to points of connection within Camp Blaz.

- Point of Contact

Name: Sunhee Park
Title: Environmental Engineer
Organization: EA Engineering, Science and Technology, Inc., PBC
Email: spark@eaest.com
Phone Number: 410-527-2057

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	FFTF Site Preparation/Parking/Utilities Infrastructure
3.	Construction / Demolition	FFTF EVOC Construction
4.	Construction / Demolition	FFTF Training Tower Construction
5.	Construction / Demolition	FFTF Mockups Construction
6.	Construction / Demolition	FFTF Covered Observation/Control Facility Construction
7.	Construction / Demolition	Final Grading/Landscaping

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 1

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

Analysis Summary:

Pollutant	2024 Action Emissions (ton/yr)	2025 Action Emissions (ton/yr)	2026 Action Emissions (ton/yr)
VOC	0.369	0.278	0.206
NOx	1.903	1.249	1.024
CO	2.738	2.673	1.660
SOx	0.007	0.005	0.003
PM 10	12.984	0.044	0.397
PM 2.5	0.070	0.043	0.048
Pb	0.000	0.000	0.000
NH3	0.004	0.007	0.004
CO2e	668.5	489.9	269.8

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Title: FFTF Site Preparation/Parking/Utilities Infrastructure

- Activity Description:

See Section 2.3.2 in EA for FFTF.
The basis for the data inputs: 1) one way trip to Layon Landfill is 26.8 miles; 2) buildings and structures including seating stands to be demolished are 950 sf with 12 ft height; 3) Tennis courts to be excavated are 20,000 sf; 4) utility lines to be trenched are 2,000 ft length with 4ft wide; and 5) average round trip of 20 miles used for other vehicles based on the project site location. Construction equipment and material mobilization to the site is considered.

- Activity Start Date

Start Month: 9
Start Month: 2024

- Activity End Date

Indefinite: False
End Month: 6
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.277093
SO_x	0.005156
NO_x	1.410049
CO	2.085102
PM 10	7.273431

Pollutant	Total Emissions (TONs)
PM 2.5	0.053244
Pb	0.000000
NH_3	0.003695
CO_2e	486.7

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month: 9
Start Quarter: 1

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 1

Start Year: 2024

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 950
Height of Building to be demolished (ft): 12

- Default Settings Used: No

- Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Generator Sets Composite	1	8
Off-Highway Trucks Composite	2	4
Other Material Handling Equipment Composite	1	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 53.6

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0357	0.0006	0.2608	0.3715	0.0109	0.0109	0.0032	58.544
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35

Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1 yd^3 / 27 ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Site Grading Phase

2.2.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 2
Number of Days: 0

2.2.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 348750
Amount of Material to be Hauled On-Site (yd^3): 590
Amount of Material to be Hauled Off-Site (yd^3): 590

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Generator Sets Composite	1	8
Graders Composite	1	8
Off-Highway Trucks Composite	2	8
Other Construction Equipment Composite	1	8
Other Material Handling Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 53.6

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.2.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Trenching/Excavating Phase

2.3.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1

Number of Days: 0

2.3.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 28000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 50

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 53.6

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.3.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**

Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.3.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Paving Phase

2.4.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

2.4.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 31000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.4.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Title: FFTF EVOC Construction

- Activity Description:
See Section 2.3.2 in EA for FFTF.
The basis of the data inputs: EVOC would be an approximately six-acre (24,280 m^2) paved surface.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.136746
SO_x	0.002000
NO_x	0.701310
CO	1.004895
PM 10	5.232539

Pollutant	Total Emissions (TONs)
PM 2.5	0.032279
Pb	0.000000
NH_3	0.001764
CO_2e	188.8

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 2
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 261360
Amount of Material to be Hauled On-Site (yd^3): 442
Amount of Material to be Hauled Off-Site (yd^3): 442

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

3.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.2 Paving Phase

3.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 3
Number of Days: 0

3.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 261360

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

3.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Title: FFTF Training Tower Construction

- Activity Description:
See Section 2.3.2 in EA for FFTF.
The basis of the data inputs: the training tower would have a footprint of approximately 7,200 square feet with 12ft height each floor.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.164639
SO_x	0.003369
NO_x	0.714564
CO	1.606728

Pollutant	Total Emissions (TONs)
PM 2.5	0.023083
Pb	0.000000
NH_3	0.004318
CO_2e	302.4

PM 10	0.095345		

4.1 Trenching/Excavating Phase

4.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

4.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 7200
Amount of Material to be Hauled On-Site (yd^3): 2600
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

4.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

4.2 Building Construction Phase

4.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 13
Number of Days: 0

4.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 7200
Height of Building (ft): 72
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

4.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Title: FFTF Mockups Construction

- Activity Description:
The training facility would include eleven Firefighter "training mockups", which will include 40,000 square foot footprint. See Section 2.3.2 in EA for FFTF for activity description.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.109914
SO_x	0.001617
NO_x	0.564369
CO	0.915767
PM 10	0.424508

Pollutant	Total Emissions (TONs)
PM 2.5	0.026281
Pb	0.000000
NH_3	0.002095
CO_2e	146.8

5.1 Site Grading Phase

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 1

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 40000
Amount of Material to be Hauled On-Site (yd^3): 67
Amount of Material to be Hauled Off-Site (yd^3): 67

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Paving Phase

5.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 4
Number of Days: 0

5.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 40000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

5.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Title: FFTF Covered Observation/Control Facility Construction

- Activity Description:
See Section 2.3.2 in EA for FFTF.
The basis of the data inputs: The covered observation/control facility would be a two-story building with an approximately 2,500 square foot building footprint with 12ft height each floor.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.127062
SO_x	0.002630
NO_x	0.569004
CO	1.203809
PM 10	0.043769

Pollutant	Total Emissions (TONs)
PM 2.5	0.018502
Pb	0.000000
NH_3	0.002694
CO_2e	238.5

6.1 Trenching/Excavating Phase

6.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

6.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 2500
Amount of Material to be Hauled On-Site (yd^3): 925
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

6.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)

ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Building Construction Phase

6.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 10
Number of Days: 0

6.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2500
Height of Building (ft): 24
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

6.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Title: Final Grading/Landscaping

- Activity Description:
17,500 square feet of grading for landscaping, fencing and lighting. See Section 2.3.2 in EA for FFTF for activity description.

- Activity Start Date
Start Month: 7
Start Month: 2026

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.038244
SO_x	0.000669
NO_x	0.216985
CO	0.254189
PM 10	0.355968

Pollutant	Total Emissions (TONs)
PM 2.5	0.007722
Pb	0.000000
NH_3	0.000456
CO_2e	64.9

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 17500
Amount of Material to be Hauled On-Site (yd^3): 20
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Air Compressors Composite	1	4
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Skid Steer Loaders Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Air Compressors Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0348	0.0007	0.2103	0.3027	0.0087	0.0087	0.0031	63.686
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Skid Steer Loaders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0185	0.0003	0.1353	0.2104	0.0019	0.0019	0.0016	30.315

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

1. General Information

- Action Location

State: Guam
County(s): Guam
Regulatory Area(s): NOT IN A REGULATORY AREA

- Action Title: Firefighter Training Facility

- Project Number/s (if applicable):

- Projected Action Start Date: 9 / 2024

- Action Purpose and Need:

The purpose of the Proposed Action is to provide facilities at MCB Camp Blaz for Fire Department personnel and mutual aid partners to meet Commander, Navy Installation Command mandatory training and certification requirements in order to perform their duties to protect lives and property.

The Proposed Action is needed because there are currently no Firefighter training facilities on the island of Guam that are compliant with Commander, Navy Installations Command (CNIC) requirements for multistory firefighting training facilities. Several six-story bachelor enlisted quarters (BEQs) are currently being constructed at MCB Camp Blaz, and MCB Camp Blaz Firefighters will be required to train on a multistory training facility of a similar height to meet their mandatory training and certification requirements.

- Action Description:

Marine Corps Base (MCB) Camp Blaz, proposes to construct and operate an FFTF at MCB Camp Blaz to support the Fire Department staff meeting their mandatory annual training and certification requirements. The Proposed Action would consist of four training facilities: an emergency vehicle operator course (EVOC), a six-story enclosed Firefighter training tower, Firefighter training mockups, and a covered observation/control facility. Construction of the Proposed Action would require the demolition of any existing facilities at the chosen alternative project site. Construction is proposed to begin in fiscal year (FY) 2024.

Alternative 2 would involve construction and operation of the FFTF on an approximately eight-acre parcel at the north end of MCB Camp Blaz. The site is within the MCB Camp Blaz installation boundary, adjacent to Potts Junction (i.e., the intersection of Route 3 and Route 3A). The site is currently forested, so this alternative would require land clearing, grading, and grubbing prior to construction. New communications lines would be constructed to connect the proposed FFTF to a point of connection within MCB Camp Blaz.

- Point of Contact

Name: Sunhee Park
Title: Environmental Engineer
Organization: EA Engineering, Science and Technology, Inc., PBC
Email: spark@eaest.com
Phone Number: 410-527-2057

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	FFTF Site Preparation/Parking/Utilities Infrastructure
3.	Construction / Demolition	FFTF EVOC Construction
4.	Construction / Demolition	FFTF Training Tower Construction
5.	Construction / Demolition	FFTF Mockups Construction
6.	Construction / Demolition	FFTF Covered Observation/Control Facility Construction
7.	Construction / Demolition	Final Grading/Landscaping

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

Analysis Summary:

Pollutant	2024 Action Emissions (ton/yr)	2025 Action Emissions (ton/yr)	2026 Action Emissions (ton/yr)
VOC	0.538	0.278	0.206
NOx	2.844	1.249	1.024
CO	3.863	2.673	1.660
SOx	0.010	0.005	0.003
PM 10	19.759	0.044	0.397
PM 2.5	0.107	0.043	0.048
Pb	0.000	0.000	0.000
NH3	0.006	0.007	0.004
CO2e	951.6	489.9	269.8

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Title: FFTF Site Preparation/Parking/Utilities Infrastructure

- Activity Description:

See Section 2.3.3 in EA for FFTF.
The basis for the data inputs: 1) one way trip to Layon Landfill is 26.8 miles; 2) 6.5 acres of trees in the existing forested areas to be cleared, graded and grubbed; 3) utility lines to be trenched are 2,000 ft length with 4ft wide; and 4) average round trip of 20 miles used for other vehicles based on the project site location. Construction equipment and material mobilization to the site is considered.

- Activity Start Date

Start Month: 9
Start Month: 2024

- Activity End Date

Indefinite: False
End Month: 6
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.442829
SO_x	0.008096
NO_x	2.348096
CO	3.154355
PM 10	14.047931

Pollutant	Total Emissions (TONs)
PM 2.5	0.090254
Pb	0.000000
NH_3	0.004630
CO_2e	767.3

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

Start Month: 9
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 4
Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 348750
Amount of Material to be Hauled On-Site (yd^3): 590
Amount of Material to be Hauled Off-Site (yd^3): 2130

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Excavators Composite	1	8
Generator Sets Composite	1	8
Graders Composite	1	8
Off-Highway Tractors Composite	1	8
Off-Highway Trucks Composite	2	8
Other Construction Equipment Composite	1	8
Other Material Handling Equipment Composite	2	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 53.6

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Concrete/Industrial Saws Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0357	0.0006	0.2608	0.3715	0.0109	0.0109	0.0032	58.544

Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Tractors Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1192	0.0016	0.7883	0.6165	0.0360	0.0360	0.0107	151.65
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 8000
Amount of Material to be Hauled On-Site (yd^3): 14

Amount of Material to be Hauled Off-Site (yd^3): 14

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 53.6

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0357	0.0006	0.2608	0.3715	0.0109	0.0109	0.0032	58.544
Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Tractors Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1192	0.0016	0.7883	0.6165	0.0360	0.0360	0.0107	151.65
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**

Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Paving Phase

2.3.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 5
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

2.3.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 31000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.3.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0357	0.0006	0.2608	0.3715	0.0109	0.0109	0.0032	58.544
Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0584	0.0013	0.2523	0.5090	0.0100	0.0100	0.0052	119.71
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0303	0.0006	0.2464	0.2674	0.0091	0.0091	0.0027	61.061
Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Off-Highway Tractors Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1192	0.0016	0.7883	0.6165	0.0360	0.0360	0.0107	151.65
Off-Highway Trucks Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Other Material Handling Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0732	0.0015	0.4243	0.4361	0.0145	0.0145	0.0066	141.35
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

2.3.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

- Activity Title: FFTF EVOC Construction

- Activity Description:
See Section 2.3.3 in EA for FFTF.
The basis of the data inputs: EVOC would be an approximately six-acre (24,280 m^2) paved surface.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 5
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.136746
SO_x	0.002000
NO_x	0.701310
CO	1.004895
PM 10	5.232539

Pollutant	Total Emissions (TONs)
PM 2.5	0.032279
Pb	0.000000
NH_3	0.001764
CO_2e	188.8

3.1 Site Grading Phase

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 2
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 261360
Amount of Material to be Hauled On-Site (yd^3): 442
Amount of Material to be Hauled Off-Site (yd^3): 442

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Tractors/Loaders/Backhoes Composite	2	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

3.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

3.2 Paving Phase

3.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 3
Number of Days: 0

3.2.2 Paving Phase Assumptions

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

- General Paving Information
Paving Area (ft^2): 261360

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Pavers Composite	1	8
Paving Equipment Composite	2	6
Rollers Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

3.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / $acre)^2$ / acre)

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

4. Construction / Demolition

4.1 General Information & Timeline Assumptions

- Activity Title: FFTF Traning Tower Construction

- Activity Description:
See Section 2.3.3 in EA for FFTF.
The basis of the data inputs: the training tower would have a footprint of approximately 7,200 square feet with 12ft height each floor.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 1
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.164639
SO_x	0.003369
NO_x	0.714564
CO	1.606728
PM 10	0.095345

Pollutant	Total Emissions (TONs)
PM 2.5	0.023083
Pb	0.000000
NH_3	0.004318
CO_2e	302.4

4.1 Trenching/Excavating Phase

4.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

4.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 7200
Amount of Material to be Hauled On-Site (yd^3): 2600
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of	Hours Per Day

	Equipment	
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20

Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

4.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

4.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)

$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

4.2 Building Construction Phase

4.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 13
Number of Days: 0

4.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 7200
Height of Building (ft): 72
Number of Units: N/A

- Building Construction Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

4.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

4.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5. Construction / Demolition

5.1 General Information & Timeline Assumptions

- Activity Title: FFTF Mockups Construction

- Activity Description:
The training facility would include eleven Firefighter "training mockups", which will include 40,000 square foot footprint. See Section 2.3.3 in EA for FFTF for activity description.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 2
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.109914
SO_x	0.001617
NO_x	0.564369
CO	0.915767
PM 10	0.424508

Pollutant	Total Emissions (TONs)
PM 2.5	0.026281
Pb	0.000000
NH_3	0.002095
CO_2e	146.8

5.1 Site Grading Phase

5.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

5.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 40000
Amount of Material to be Hauled On-Site (yd^3): 67
Amount of Material to be Hauled Off-Site (yd^3): 67

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

5.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)

WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

5.2 Paving Phase

5.2.1 Paving Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2025

- Phase Duration
Number of Month: 4
Number of Days: 0

5.2.2 Paving Phase Assumptions

- General Paving Information
Paving Area (ft^2): 40000

- Paving Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

5.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

5.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase
$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

6. Construction / Demolition

6.1 General Information & Timeline Assumptions

- Activity Title: FFTF Covered Observation/Control Facility Construction

- Activity Description:
See Section 2.3.3 in EA for FFTF.
The basis of the data inputs: The covered observation/control facility would be a two-story building with an approximately 2,500 square foot building footprint with 12ft height each floor.

- Activity Start Date
Start Month: 11
Start Month: 2024

- Activity End Date
Indefinite: False
End Month: 10
End Month: 2025

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.127062
SO_x	0.002630
NO_x	0.569004
CO	1.203809
PM 10	0.043769

Pollutant	Total Emissions (TONs)
PM 2.5	0.018502
Pb	0.000000
NH_3	0.002694
CO_2e	238.5

6.1 Trenching/Excavating Phase

6.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2024

- Phase Duration
Number of Month: 1
Number of Days: 0

6.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 2500
Amount of Material to be Hauled On-Site (yd^3): 925
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

6.1.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

6.1.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

6.2 Building Construction Phase

6.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 1
Start Year: 2025

- Phase Duration

Number of Month: 10
Number of Days: 0

6.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Office or Industrial
Area of Building (ft^2): 2500
Height of Building (ft): 24
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

6.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0680	0.0013	0.4222	0.3737	0.0143	0.0143	0.0061	128.77
Forklifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0236	0.0006	0.0859	0.2147	0.0025	0.0025	0.0021	54.449
Tractors/Loaders/Backhoes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

6.2.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase
VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

7. Construction / Demolition

7.1 General Information & Timeline Assumptions

- Activity Title: Final Grading/Landscaping

- Activity Description:
17,500 square feet of grading for landscaping, fencing and lighting. See Section 2.3.3 in EA for FFTF for activity description.

- Activity Start Date
Start Month: 7
Start Month: 2026

- Activity End Date
Indefinite: False
End Month: 8
End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.038244
SO_x	0.000669
NO_x	0.216985
CO	0.254189
PM 10	0.355968

Pollutant	Total Emissions (TONs)
PM 2.5	0.007722
Pb	0.000000
NH_3	0.000456
CO_2e	64.9

7.1 Site Grading Phase

7.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date
Start Month: 7
Start Quarter: 1
Start Year: 2026

- Phase Duration
Number of Month: 2
Number of Days: 0

7.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 17500
Amount of Material to be Hauled On-Site (yd^3): 20
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Air Compressors Composite	1	4
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Skid Steer Loaders Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20
Average Hauling Truck Round Trip Commute (mile): 20

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

7.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Air Compressors Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0348	0.0007	0.2103	0.3027	0.0087	0.0087	0.0031	63.686
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Skid Steer Loaders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0185	0.0003	0.1353	0.2104	0.0019	0.0019	0.0016	30.315

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
All	00.6330	00.0090	00.5200	10.3730	00.0280	00.0140		00.0950	00500.800

7.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

AIR CONFORMITY APPLICABILITY MODEL REPORT
ALTERNATIVE 2

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

Annual Emissions Estimates for Firefighter Training Activities for All Alternatives

Emissions Estaimates for Live Fire

Description	Fuel Type	Fuel Throughput		NO_X	VOC	PM_{10}	$PM_{2.5}$	CO	SOx	CO_2	N_2O	CH_4	CO2e	HAPs
			unit	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
Live Fire	Propane	15,000.00	gal/yr	4.28E-02	1.80E-01	7.13E-02	7.13E-02	1.16E-01	1.50E-04	9.46E+01	9.00E-04	4.50E-03	9.50E+01	5.25E-03
Live Fire	Wood Pallets	1.00	ton/yr	2.00E-03	9.50E-03	8.50E-03	8.50E-03	7.00E-02	--	1.81E+00	6.95E-05	2.85E-03	1.90E+00	--
Live Fire	Hay	1.00	ton/yr	2.25E-03	8.50E-03	1.60E-02	1.60E-02	6.95E-02	--	1.07E+00	3.80E-05	2.50E-03	1.15E+00	--
			Total	**0.05**	**0.20**	**0.10**	**0.10**	**0.26**	**1.50E-04**	**97.48**	**1.01E-03**	**9.85E-03**	**98.03**	**0.01**

	Fuel Type	Unit	NO_X	VOC	PM_{10}	$PM_{2.5}$	CO	SOx	CO_2	N_2O	CH_4	$HAPs^2$
Live Fire Emission Factors[1]	Propane	$lb/10^3$ gal	5.7	24	9.5	9.5	15.4	0.02	12,613.00	0.12	0.60	0.70
	Wood Pallets	lb/ton	4	19	17	17	140	--	3,615.00	0.14	5.70	--
	Hay	lb/ton	4.5	17	32	32	139	--	2,149.00	0.08	5.00	--

Notes:

1. Emission factors obtained from Air Emissions Guide for Airforce Stationary Sources, June 2021.

2. Formaldehyde

GHG Global Warming Potentials

CO2	1
N2O	298
CH4	25

Emissions Estaimates for Fire Trucks and Personal Vehicles

Description	VMT (miles/yr)	NO_X	VOC	PM_{10}	$PM_{2.5}$	CO	SOx	CO_2e
		tpy	tpy	tpy	tpy	tpy	tpy	tpy
Fire Trucks[1]	4,480	4.63E-03	1.16E-03	8.92E-05	8.18E-05	1.54E-02	2.34E-05	3.03E+00
Personal Vehicle[2]	13,824	4.62E-03	4.44E-03	8.15E-05	7.33E-05	5.30E-02	3.85E-05	5.66E+00
	Total	**9.26E-03**	**5.60E-03**	**1.71E-04**	**1.55E-04**	**6.83E-02**	**6.19E-05**	**8.68E+00**

Emission Factors[3]	Unit	NO_X	VOC	PM_{10}	$PM_{2.5}$	CO	SOx	CO_2e
GOV All Vehicles[4]	g/mile	0.94	0.236	0.0181	0.0166	3.115	0.00475	614.5
POV All Vehicles[5]	g/mile	0.304	0.292	0.00536	0.00482	3.483	0.00253	371.966

Notes:

1. 40 miles per each fire truck per training event, 6 fire trucks for monthly training, 10 fire trucks for qurterly training

2. Average 24 people per training event, 4 miles round trip per vehicle and 10 days per month

2. Emissions factors obtained from Air Emissions Guide for Air Force Mobile Source, June 2021

3. On-Road Vehicle Composite Emission Factors for 2024 GOV for Pacific Island, All Vehicles

3. On-Road Vehicle Composite Emission Factors for 2024 POV for Pacific Island, All Vehicles

GHG Emissions from Electricity Consumption and Loss of Carbon Sequestration from Tree Removal Calculations

1. Electricity Consumed

This calculation is intended for the equvalencies associated with GHG emissions associated with electricity consumed.
This is a national average emissoins factor.

EF = 4.33 × 10^{-4} metric tons CO_2/kWh based on eGRID, U.S. annual CO_2 total output emission rate (lb/MWh), year 2019 data
(EPA website: epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references)
Note: This calculation does not include any greenhouse gases other than CO_2.

Total square footage	48200	sf	based on a six-story of 7,200 sf and a two-story 2,500 sf buildings
Electricity energy density	17.14	kWh/sf	calculated for Honolulu HI

CO_2 emissions = EF × Total sf × electricity energy density
= 4.33 × 10-4 × 48200 × 17.14
= 358 metric tons = **394 tons**

2. Loss of Carbon Sequestration from Tree Removal

Input data:	1000	trees per acre (conservative assumption
	0.1	acres for Alternative 1
	6.5	acres for Alternative 2
	50	lbs CO_2 sequestered per tree per year (European Environment Agency: Trees help tackle climate change)
	2000	conversion factor lb/ton

Total loss of CO_2 sequestraion for Alternative 1 = 1000 × 0.1 × 50 /2000 = 2.5 tons/yr
Total loss of CO_2 sequestraion for Alternative 2 = 1000 × 6.5 × 50 /2000 = 162.5 tons/yr

This page intentionally left blank.

Appendix E
Cumulative Impacts Assessment

This page intentionally left blank.

E Cumulative Impacts Assessment

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

E.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR § 1508.7 as "the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

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

In addition, CEQ and the United States Environmental Protection Agency (USEPA) have published guidance addressing implementation of cumulative impact analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ 2005) and Consideration of Cumulative Impacts in USEPA Review of NEPA Documents (EPA 1999). CEQ guidance entitled Considering Cumulative Impacts Under NEPA (1997) states that cumulative impact analyses should:

"…determine the magnitude and significance of the environmental consequences of the Proposed Action in the context of the cumulative impacts of other past, present, and future actions...identify significant cumulative impacts…[and]…focus on truly meaningful impacts."

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

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

E.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. The project area delimits the geographic extent of the cumulative impacts analysis. In general, the project area will include those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the Proposed Action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the Proposed Action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for EISs and EAs, management plans, land use plans, and other planning related studies.

E.3 Past, Present, and Reasonably Foreseeable Actions

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

Table E-1 Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*	*Description*
Past Actions		
Guam and Commonwealth of the Northern Mariana Islands Military Relocation	EIS (2010) and SEIS (2015)	In September 2010, the Navy signed a Record of Decision (ROD) regarding the 2010 Final Environmental Impact Statement (EIS) for the Guam and Commonwealth of the Northern Mariana Islands (CNMI) Military Relocation. The 2010 EIS evaluated a range of military relocation efforts, including facilities and infrastructure to support relocation of approximately 8,600 Marines and approximately 9,000 dependents from Okinawa, Japan to Guam. In August 2015, the Navy issued a ROD regarding the 2015 Supplemental Environmental Impact Statement (SEIS) for the "2012 Road Map Adjustments," which adopted a new force posture in the Pacific providing for a materially smaller and reconfigured Marine Corps force on Guam. This SEIS evaluated additional alternatives for Marine Corps main cantonment and family housing area to support the scaled down relocation of Marine Corps forces to Guam. The ROD was signed in August 2015 and the Department of Defense (DoD) has proceeded to implement the Preferred Alternative, including the construction of the main cantonment.
Joint Region Marianas Integrated Natural Resources Management Plan	EA (2019)	This Integrated Natural Resources Management Plan (INRMP) is focused on Joint Region Marianas (JRM)-administered and leased terrestrial and submerged lands. The purpose of this INRMP is to maintain long-term ecosystem health and operational requirements of the DoD's mission while minimizing impacts to natural resources at JRM sites. The plan serves as a formal structure to integrate existing natural resources management programs, current projects, activities, and plans that have been incorporated into the INRMP. Priorities are based, in part, on annual requirements, environmental considerations, and mission support needs.
Mariana Islands Training and Testing	SEIS/OEIS (2020)	A Final Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) was published in June 2020 , and it evaluated the potential environmental impacts of conducting training and testing activities in the Mariana Islands Testing and Training (MITT) Study Area. The MITT Study Area is composed of the established sea-based (at sea) ranges and land-based training areas on Guam and the Commonwealth of the Northern Mariana Islands, including Northwest Field (NWF), Andersen Air Force Base (AAFB). Training activities at NWF include fixed- and rotary-wing aircraft overflights.
Munitions Storage Igloos at Andersen Air Force Base, Guam	EA (2020)	The United States (U.S.) Air Force is constructing new munitions storage facilities and infrastructure upgrades in MSA-1I on AAFB, Guam. The Proposed Action includes construction of 48 new Hayman style earth covered magazines. Construction of the igloos is ongoing and the anticipated timeline for completion is 2026.

Key: EA = Environmental Assessment; EIS = Environmental Impact Statement; OEIS = Overseas Environmental Impact Statement; SEIS = Supplemental Environmental Impact Statement

Table E-1 Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*	*Description*
Present and Reasonably Foreseeable Future Actions		
Infrastructure Upgrades Andersen Air Force Base, Guam	EIS in progress	The U.S. Air Force proposes to construct infrastructure upgrades at AAFB and to use this infrastructure consistent with existing installation operations once construction is completed. Infrastructure upgrades would occur adjacent to the existing airfield operations area and in MSA-1 , totaling approximately 204 acres (83 hectares). Infrastructure upgrades adjacent to the existing airfield operations area would occur in a location that is referred to as the "North Ramp."
Air National Guard Beddown for the Fifth Space Control Squadron Basing Actions Andersen Air Force Base, Guam	EA (2022)	The U.S Air Force proposes to construct and operate facilities for the beddown of a defensive Air National Guard (ANG) Space Control Squadron (SPCS) mission at AAFB, Guam. The proposed SPCS #5 beddown would encompass an area approximately five acres (two hectares) in size and would be located near the Base Exchange, which is bounded by New York Avenue, 4th Street, Mobile Avenue, and 5th Street. The proposed improvements would include the construction of a new administration building, maintenance area, hazardous storage area, equipment pad, parking lot, and air conditioner unit. The SPCS #5 would require the addition of between 62 and 105 ANG personnel in support of a defensive mission.
198 megawatt Ukudu Power Plant Dededo, Guam	N/A	Guam Power Authority is constructing the new 198 MW Ukudu Power Plant in Dededo, approximately three miles (five kilometers) south of MCB Camp Blaz. The new power plant would replace existing power plants in Cabras and would burn clean Ultra-low Sulfur Diesel (ULSD) and natural gas instead of "heavy" fuel. The new power plant would increase power reliability on Guam and would integrate existing and future sources of renewable energy into the island wide power system.
Defense of Guam Enhanced Integrated Air and Missile Defense Multiple site on Guam	EIS in progress	The EIAMD will involve the deployment and operation of a combination of components from the Missile Defense Agency (MDA), Department of the Army, and Department of the Navy that would be integrated for air and missile defense. These proposed components include missile defense radars and sensors, missile interceptor launchers, and command and control systems. The MDA anticipates airspace modification may be necessary at sites where radars would be located. The MDA and Army need to strategically locate and integrate the system components at multiple sites around Guam. The MDA has not released specific locations so this project is not included in Figure 3-1.
Construction of Facilities and Infrastructure at the Guam National Wildlife Refuge Ritidian Unit, Yigo, Guam	EA planning in progress	The U.S. Marine Corps proposes to construct replacement facilities and associated infrastructure for the U.S. Department of the Interior (DOI) (including the U.S. Fish and Wildlife Service [USFWS] and U.S. Geological Survey [USGS]) at the Ritidian Unit of the Guam National Wildlife Refuge (GWNR). The proposed action also includes road improvements and development of an alternate public access route to the new DOI facilities and recreation areas within the GWNR; demolition of the existing DOI facilities; and preparation of the demolition site for restoration and regeneration.

Key: EA = Environmental Assessment; EIS = Environmental Impact Statement; OEIS = Overseas Environmental Impact Statement; SEIS = Supplemental Environmental Impact Statement

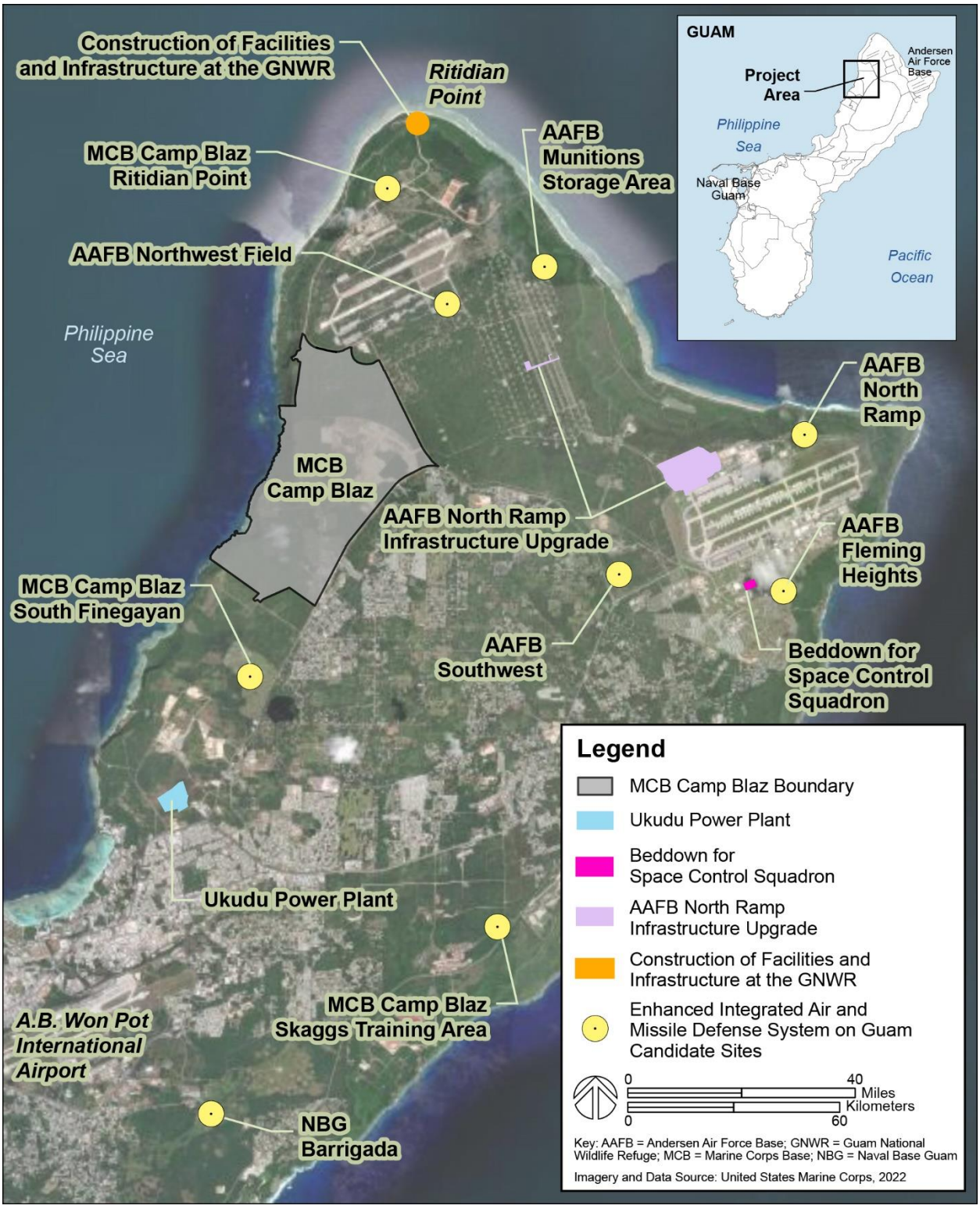


Figure E-1 Location of Reasonably Foreseeable Future Actions

E.4 Cumulative Impact Analysis

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

E.4.1 Visual Resources

E.4.1.1 Description of Region of Influence

The Region of Influence (ROI) for visual resources consists of areas where physical changes would occur and the locations from which they are visible. For this project this is defined as Marine Corps Base (MCB) Camp Blaz and the adjacent areas from which the Proposed Action would be visible, including public views into MCB Camp Blaz from Route 3. The area is relatively flat with no prominent topographic features such as hills or valleys.

E.4.1.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2010 EIS for Guam and CNMI Military Relocation found that impacts to visual resources from the development of MCB Camp Blaz main cantonment would be significant but mitigable to less than significant. The EIS identified a suite of mitigation measures that would be used to reduce impacts, including but not limited to design guidelines for all buildings, development of a landscape plan, using native flora to create a natural appearing “screen” (JGPO, 2010). The 2015 SEIS found that impacts to visual resources from the development of the main cantonment would be somewhat less than those described in the 2010 EIS as there is less development proposed under the updated Preferred Alternative. Construction of MCB Camp Blaz is now underway, changing the visual landscape from forested to a more urban visual character.

E.4.1.3 Cumulative Impact Analysis

The Proposed Action would result in additional, but less than significant impacts to visual resources within the ROI to what was considered in the 2010 and 2015 Guam and CNMI Military Relocation EIS/SEIS.

The Preferred Alternative would be visible from Route 3; however, the newly introduced visual elements would not appreciably degrade visual resources and would be consistent with the nature and type of development in the southern portion of MCB Camp Blaz. Furthermore, the Preferred Alternative project site is located within a previously developed portion of MCB Camp Blaz, and it is not visible within the same view planes as the new development associated with the Main Cantonment. Therefore, the Preferred Alternative combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to visual resources within the ROI.

Alternative 2 would also be visible from Route 3 on an area adjacent to land already cleared and developed for the main cantonment; however, there would be a remaining forested buffer that would help to obstruct views into the site so the overall visual impacts would be minimal. Mitigation measures

identified in the 2010 EIS would still be implemented to reduce visual resources impacts from MCB Camp Blaz to less than significant, and the implementation of Alternative 2 would result in only minimal additive impacts to publicly accessible views from Route 3.

Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to visual resources within the ROI.

E.4.2 Cultural Resources

E.4.2.1 Description of Geographic Study Area

The area of potential effect (APE) for the Proposed Action includes the areas directly impacted by the Preferred Alternative and Alternative 2. For the Preferred Alternative, the Navy determined that the APE encompasses 12.8 acres (5.2 hectares) in the southern portion of MCB Camp Blaz. For Alternative 2, the Navy determined that the APE encompasses 17 acres (6.9 hectares) in the northwest corner of MCB Camp Blaz near Potts Junction. The ROI for cultural resources includes the Proposed Action APE and a 1,600-foot (500-meter) buffer to allow for a comprehensive analysis of potential cumulative impacts to cultural resources associated with the past, present, and reasonably foreseeable future actions.

E.4.2.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2010 EIS found that the construction of the cantonment could have potential significant adverse direct impacts to approximately 31 historic properties, and potential significant adverse impacts to four traditional cultural properties. For the historic properties, mitigation was coordinated in accordance with Section 106 consultation with the Guam State Historic Preservation Office. For the traditional cultural properties, mitigation measures included education, public access, and the implementation of preservation plans.

In 2011, the DoD, the Advisory Council on Historic Preservation, the Guam State Historic Preservation Officer (SHPO), and the Commonwealth of the Northern Mariana Islands SHPO entered into a programmatic agreement (PA) regarding the military relocation to the islands of Guam and Tinian. The PA governs processes for documenting potential effects on cultural resources and considering the views of the public and the parties to the 2011 PA, as projects under the relocation action are defined, in order to confirm the identification, evaluation, and mitigation measures when historic properties may be adversely affected.

E.4.2.3 Cumulative Impact Analysis

Implementation of the Preferred Alternative is not expected to have negative impacts on cultural resources. There are no known archaeological sites or historical architectural within the Preferred Alternative APE, and the potential to encounter cultural resources in the Preferred Alternative project area is low. There is an existing, temporary artifact staging area (Figure 2-2) within the Preferred Alternative APE. The Navy is in coordination with the Guam SHPO to relocate this temporary artifact staging area to a more suitable location, and this relocation would be completed prior to the construction of the Preferred Alternative. Therefore, the Preferred Alternative would not contribute additive impacts to cultural resources in the ROI.

Three features of Site 66-08-2305, a portion of former fuel pipeline (Feature 2), a refuse dump (Feature 3a), and a naval artillery round crater (Feature 4) are within the APE for Alternative 2. Construction of

Alternative 2 would likely destroy these features. However, should Alternative 2 be carried forward for implementation, the Navy would comply with the 2011 PA, including consultation with Guam SHPO and the identification and implementation of mitigation measures for potential adverse effects to Site 66-08-2305. Through the implementation of mitigation measures, it would be expected that impacts to cultural resources from Alternative 2 would be less than significant. While this does represent an additive negative impact to the previous construction of MCB Camp Blaz, it is relatively limited in scope. Furthermore, cultural resources at MCB Camp Blaz would continue to be managed in a comprehensive manner in compliance with the 2011 PA.

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

E.4.3 Terrestrial Biological Resources

E.4.3.1 Description of Geographic Study Area

The ROI for terrestrial biological resources includes northern Guam.

E.4.3.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2015 SEIS found that development of MCB Camp Blaz will have significant impacts that could be mitigated to less than significant for terrestrial biological resources. Impacts include the clearing of limestone forest, conversion of conservation areas and impacts to recovery habitat for protected species. To mitigate these impacts, the Navy has implemented a range of mitigation measures including forest enhancement on a minimum of 780 acres (316 hectares) of limestone forest in compliance with the biological opinion for the action (USFWS, 2017).

Mariana Islands Training and Testing

An aircraft noise and wildlife response study was conducted for Andersen Air Force Base Northwest Field to monitor the effects of noise events associated with aircraft operations to the Mariana fruit bat and Mariana Crow (SWCA Environmental Consultants, 2009). The study monitored various behaviors of individual bats during periods of no aircraft noise and periods of takeoffs and landings, and flushing behaviors associated with the former colony location at Pati Point. No flushing of the entire Mariana fruit bat colony was observed during any aircraft overflight activity (SWCA Environmental Consultants, 2009). Pursuant to the Endangered Species Act (ESA), the Navy determined that sound generated from aircraft overflights may affect, but is not likely to adversely affect, the Mariana common moorhen, Mariana crow, Mariana fruit bat, Mariana swiftlet, and the Micronesian megapode.

Joint Region Marianas Integrated Natural Resources Management Plan

The purpose of the JRM INRMP is to maintain long-term ecosystem health and operational requirements of the DoD's mission while minimizing impacts to natural resources at JRM sites. It is also the intent of the JRM INRMP to provide a conservation benefit to federally protected species and their designated critical habitats under the ESA. In order to meet these purposes, this INRMP establishes a list of management projects designed to protect species and their habitat at JRM sites without infringing on the DoD's military mission. For the area that includes MCB Camp Blaz, the INRMP proposes 19 terrestrial biological resources ecosystem management projects including but not limited to forest enhancement and monitoring of ESA-listed and MBTA-listed species.

Munitions Storage Igloos at AAFB

Construction would involve the disturbance of 51 acres (21 hectares), with approximately 12 acres (five hectares) of currently undisturbed land listed as native limestone forest. Best management practices (BMPs) and conservation measures include Contractor Education Program (*Cycas micronesica*, *Tabernaemontana rotensis*, and Mariana fruit bats), pre-construction surveys and hooded lighting (Mariana fruit bats), biosecurity protocols (invasive species), preconstruction surveys and salvage/transplanting for ESA-listed plants, and annual reporting to adaptively manage ESA-listed species. These procedures will be executed to minimize impacts to a level where they are not significant to the environment and ESA- and MBTA-listed species existence. The USFWS issued a signed Biological Opinion on 1 July 2020 concurring with the BMPs that minimize potential effects to ESA-listed species.

Infrastructure Upgrades at AAFB

Long-term, moderate, adverse impacts would be expected from removal of native vegetation and habitat at both the North Ramp and MSA-1 project areas. Short-term, minor to moderate, adverse impacts on wildlife during construction would occur as a result of physical disturbance and construction-related noise, lighting, and dust emissions. Similar long-term, minor, adverse impacts on wildlife could occur from noise associated with aircraft ground activities and operational vehicle traffic. Short- and long-term, moderate to major/significant, adverse impacts would be expected from further degradation or modification of available supporting forest habitat, affecting special status species. For plant species, short-term, significant, adverse impacts would be expected from physical disturbance and mortality of special status plant species within the project area, and long-term, moderate, adverse impacts would be expected from habitat loss and degradation. For wildlife species, short-term major/significant, adverse impacts would be expected from physical disturbance by construction and traffic noise, and long-term, significant, adverse impacts would occur for special status species that relocate from the project area during construction activities. Additional long-term, minor, adverse impacts would be expected from noise disturbances associated with aircraft ground activities on the North Ramp and operational vehicle traffic.

Air National Guard Beddown for the Fifth Space Control Squadron Basing Actions

The proposed project site in the cantonment area on AAFB is located in a developed area and does not provide suitable habitat for wildlife or sensitive vegetation. The project is not likely to adversely affect the Mariana fruit bat because the proposed facilities would not require barbed wire fencing and no tree removal is anticipated.

E.4.3.3 Cumulative Impact Analysis

The Preferred Alternative would be constructed on primarily developed land and would result in only minimal vegetation clearing. Potential impacts to migratory birds and the Mariana fruit bat would be avoided or minimized through the implementation of conservation measures similar to those identified for other past, present, and reasonably foreseeable projects in the ROI. Therefore, the Preferred Alternative would have negligible additive impacts to terrestrial biological impacts when combined with the past, present, and reasonably foreseeable future projects.

Alternative 2 would result in vegetation clearing on approximately 0.5 acres (0.2 hectares) of *Spathodea Forest* and 7.2 acres (2.9 hectares) of *Vitex* forest. Potential impacts to migratory birds and the Mariana fruit bat would be avoided or minimized through the implementation of conservation measures. There are nine high value trees (*Elaeocarpus joga*) within the footprint that would be removed. One federally

protected species was identified within the Alternative 2 footprint during surveys in 2015: five *Tuberolabium guamense* orchids growing on non-native *Vitex parviflora* trees. The Navy would follow conservations measures that require that healthy *Tuberolabium guamense* individuals be transplanted into protected areas where feasible (USFWS, 2017). Additionally, the forested area that would be cleared with the implementation of Alternative 2 was included in the area that was assumed for clearing as part of the 2015 SEIS. Therefore, mitigation for that potential clearing is already being addressed (i.e., forest enhancement), and the potential clearing of forest for Alternative 2 would not create any additive impacts to what was analyzed in the 2015 SEIS.

Overall, terrestrial biological resources in the ROI would continue to be managed in line with the goals and management projects established in the JRM INRMP. The Mariana fruit bat has a known range that extends beyond the ROI and includes Guam and the Commonwealth of the Northern Mariana Islands. Therefore, other projects not described in this cumulative impacts analysis could have impacts on the species. However, the USFWS will continue to monitor the Mariana fruit bat and consult on projects that could have potential effects on the species under the ESA. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to the Mariana fruit bat or other terrestrial biological resources within the ROI.

E.4.4 Noise

E.4.4.1 Description of Geographic Study Area

The ROI for noise encompasses land uses within a half-mile of the Proposed Action project areas at MCB Camp Blaz. Noise-sensitive receptors in the vicinity of MCB Camp Blaz include residential homes along Route 3 and Finegayan Elementary School.

E.4.4.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2015 SEIS found that construction and operations of MCB Camp Blaz main cantonment would result in less than significant impacts on the noise environment. Short-term construction noise would result from noise-producing activities in the immediate vicinity of residential receptors along Route 3. The closest proposed construction activity for this alternative would occur approximately 500 feet (152 meters) from the average receptor, with Route 3 frontage and noise levels estimated to be 65.4 A-weighted decibels (dBA). Short-term increases in truck traffic used to transport materials on- and off-site would also produce noise disturbance of approximately 65 to 70 dBA within and near the construction corridors. Again, this would produce short-term, localized noise for brief periods, but it would not create any permanent, adverse direct or indirect noise impacts to human health or the local environment. Long-term direct and indirect noise impacts were found to be less than significant.

E.4.4.3 Cumulative Impact Analysis

For both the Preferred Alternative and Alternative 2, construction of the FFTF would result in short-term increases in daytime noise; however the estimated construction noise levels would not exceed existing noise levels from vehicle traffic along Route 3. Noise associated with the operation of the Proposed Action is anticipated to have negligible effect on the noise environment.

Individually, both the Proposed Action and the development of MCB Camp Blaz were found to have less than significant impacts on the noise environment. However, the time periods for construction would

overlap and could result in additive impacts. The Preferred Alternative location for the FFTF is located approximately 1.5 miles (2.4 kilometers) south of MCB Camp Blaz and Alternative 2 is located approximately 0.5 miles (0.8 kilometers) east of MCB Camp Blaz. Given geographical distance between the primary construction activities for MCB Camp Blaz and that of the Proposed Action sites, the construction noise would be dispersed and the potential for additive impacts would be reduced.

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

E.4.5 Water Resources

E.4.5.1 Description of Geographic Study Area

The ROI for water resources is MCB Camp Blaz and the Finegayan sub-basin of the Northern Guam Lens Aquifer. The Proposed Action would not impact surface water, wetlands, floodplains, so this cumulative impacts analysis focuses on groundwater resources.

E.4.5.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

As described in the 2010 EIS and the 2015 EIS, the construction and operation of the MCB Camp Blaz includes stormwater runoff protection measures and a Low Impact Development (LID) approach to the planning, design, and implementation of the stormwater system to reach goals for stormwater quality and groundwater recharge. The 2010 EIS assumed a daily potable water demand of 5.8 million gallons per day (MGd) (22.0 million liters per day [MLd]), however, this was reduced to 1.7 MGd (6.4 MLd) in the 2015 SEIS. Both documents found that the related potable water demand will result in less than significant impacts to water resources.

E.4.5.3 Cumulative Impact Analysis

Implementation of the Preferred Alternative would include water usage during construction (0.003 MGd [0.011 MLd]) and operations (0.002 MGd [0.008 MLd]), but it would be negligible when compared with overall MCB Camp Blaz demand for water (1.7 MGd [6.4 MLd]) and would be well within the available yield for the Finegayan sub-basin of the NGLA (3.8 MGd [14.4 MLd]). Additionally, the construction of the Proposed Action and MCB Camp Blaz would include stormwater runoff protection measures and LID design to protect stormwater quality and groundwater recharge.

For Alternative 2, the impacts to water resources would be the same as the Preferred Alternative.

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

E.4.6 Air Quality

E.4.6.1 Description of Geographic Study Area

The air quality ROI includes Northern Guam, where MCB Camp Blaz is located.

E.4.6.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2010 EIS found that construction and operations of MCB Camp Blaz, as well as other military relocation projects in Northern Guam would have less than significant impacts to air quality. Subsequently, the 2015 SEIS found that construction and operations emissions would decrease further from what was originally estimated in the 2010 EIS because the number of Marines relocating to Guam had decreased.

Mariana Islands Training and Testing

The MITT air quality evaluation found that there would be increased emissions; however, these increased emissions would not affect the National Ambient Air Quality Standards attainment status of the ROI and would have less than significant impacts to air quality.

Munitions Storage Igloos at AAFB

Construction activities would generate minor amounts of air emissions and dust, which would have the potential to migrate off-site, depending on wind and soil conditions and the intensity of surface disturbance on any given day. The estimated emissions from construction and operations would be negligible and standard BMPs such as proper maintenance of vehicles and construction equipment and dust suppression methods (watering of exposed soil) would be implemented by the construction contractor as needed to minimize and further reduce air quality impacts.

Infrastructure Upgrades at Andersen Air Force Base

Per the AAFB Infrastructure EIS, short- and long-term, minor, adverse air quality impacts would be generated by the Proposed Action. Construction would generate temporary increases in fugitive dust as well as equipment and transport emissions. Operations would generate minor increases in emissions from additional personnel and use of stand-by generators. No exceedances of air quality thresholds or regulations would occur.

Air National Guard Beddown for the Fifth Space Control Squadron Basing Actions

Air pollutant emissions would be predominantly from construction of new facilities. Criteria pollutants would result if new stationary sources (such as boilers or emergency generators) for the proposed new facilities are installed and operated. This may require modification to the existing Title V Permit. The Proposed Action is expected to result in less than significant impacts on air quality.

198 megawatt Ukudu Power Plant

The power plant will burn ULSD and will be located in Ukudu, south of MCB Camp Blaz. Per a 2018 presentation to the Guam Legislature, the power plant will meet air quality criteria set by Guam Environmental Protection Agency and the U.S. Environmental Protection Agency.

Defense of Guam Enhanced Integrated Air and Missile Defense

The project is considering nine candidate sites in Northern Guam (Figure E-1). If carried forward for implementation, these sites would likely include construction activities in the ROI that could have at least a short-term adverse impact on air quality. A more detailed analysis of impacts to air quality and greenhouse gas emissions from the project will be completed in the forthcoming EIS.

Construction of Facilities and Associated Infrastructure at the Guam National Wildlife Refuge

Short-term adverse impacts on air quality would be expected from the construction of the new facilities and infrastructure at the GNWR. A more detailed analysis of impacts to air quality and greenhouse gas emissions from the project will be completed in the forthcoming EA.

E.4.6.3 Cumulative Impact Analysis

Implementation of the Proposed Action at both the Preferred Alternative and Alternative 2 project areas would generate short-term, temporarily emitted air emissions (e.g., fugitive dust, combustion of fossil fuels for construction equipment, etc.) during the construction period. BMPs would be implemented to minimize fugitive dust during construction. Air emissions were estimated for the construction and operational period and do not exceed established benchmarks and are not expected to result in violations of any of the federal and state standards, as their estimated emissions were all well below the reference thresholds.

Emissions from the Proposed Action could interact with emissions from the past, present, and reasonably foreseeable future projects. However, the distance between the Proposed Action and the Infrastructure Upgrades at Andersen Airforce Base (i.e., 1.7 miles [2.7 kilometers]), Air National Guard Beddown (i.e., 4.3 miles [6.9 kilometers]), Ukudu Power Plant (3.1 miles [5.0 kilometers]), and Facilities and Infrastructure Improvements at GWNR (4 miles [6.4 kilometers]) would allow for sufficient dispersion of emissions and is not likely to generate significant cumulative effects. Emissions from the Proposed Action would more directly interact with the emissions generated by the construction and operations of MCB Camp Blaz; however, the Proposed Action and construction and operations activities at MCB Camp Blaz would implement BMPs and obtain permits to comply with the Guam Air Pollution Control Standards and Regulations. Therefore, the joint emissions from the Proposed Action and MCB Camp Blaz are expected to have a less than significant impacts on air quality and greenhouse gases.

Implementation of the Proposed Action at both the Preferred Alternative and Alternative 2 project areas, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to the air quality and greenhouse gases within the ROI.

E.4.7 Hazardous Materials and Hazardous Wastes

E.4.7.1 Description of Geographic Study Area

The ROI for Hazardous Materials and Hazardous Wastes is Northern Guam.

E.4.7.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

Both the 2010 EIS and the 2015 SEIS concluded that impacts to hazardous materials and hazardous wastes associated with the construction and operation of MCB Camp Blaz main cantonment would be less than significant. There would be short-term temporary increase in the volumes of hazardous materials and hazardous wastes associated with construction. In the long-term, operation of MCB Camp Blaz will result in a minimal increase in the volumes of hazardous materials and hazardous wastes. Additionally, the 2015 SEIS stated that these increases would be significantly smaller than originally outlined in the 2010 EIS, given the reduction in Marines being relocated to Guam under the 2015 SEIS.

Other past, present, and reasonably foreseeable future actions would generate limited volumes of hazardous materials and hazardous wastes. Regardless, all hazardous materials and hazardous wastes would be handled and disposed of in compliance with all applicable regulations and BMPs.

E.4.7.3 Cumulative Impact Analysis

Construction of the Preferred Alternative would include the handling and disposal of at least some hazardous materials and hazardous wastes, primarily associated with fuel for construction vehicles. Construction contractors would be required to comply with all applicable requirements concerning handling of construction-related hazardous substances. The additional hazardous materials and hazardous wastes generated by the Preferred Alternative would be minimal compared to those generated by the construction of MCB Camp Blaz, and would well within the amounts considered under the original 2010 EIS that were found to be less than significant.

Therefore, implementation of the Proposed Action at both the Preferred Alternative and Alternative 2 project areas, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

E.4.8 Public Health and Safety

E.4.8.1 Description of Geographic Study Area

The ROI for public health and safety analysis includes areas within the study area where construction and operations-related actions would occur, as well as adjacent communities within 0.5 miles of the study area boundary.

E.4.8.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2015 SEIS identified that the construction and operation of MCB Camp Blaz would have less than significant impacts on public health and safety due to the presence of manned gates and signage banning the presence of unauthorized personnel from the installation.

E.4.8.3 Cumulative Impact Analysis

The Preferred Alternative and Alternative 2 would both provide beneficial impacts for both MCB Camp Blaz and the wider Guam community through improved firefighter training facilities. Currently, there are no multistory firefighter training props on Guam. The Proposed Action includes a six-story training tower which would provide multistory training opportunities to improve firefighter readiness to respond to emergencies at the six-story bachelor enlisted quarters (BEQs) on MCB Camp Blaz, and the multistory hotel and apartment complex towers in Tumon and other areas of Guam. Mutual aid partners would be invited to use the FFTF for training alongside MCB Camp Blaz firefighters.

Additionally, both the Preferred Alternative and Alternative 2 would be located within MCB Camp Blaz, and the presence of manned gates and signage would prevent the presence of unauthorized personnel from the project site.

Therefore, implementation of the Proposed Action (either the Preferred Alternative or Alternative 2), combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to public health and safety within the ROI.

E.4.9 Environmental Justice

E.4.9.1 Description of Geographic Study Area

The affected environment for environmental justice is defined using demographic data that identifies low-income populations, minority, and Chamorro populations, relative to the location of the Preferred Alternative and Alternative 2 project areas. The area that makes up the ROI consists of census designated place (CDP) where project activities would occur as well as adjacent CDPs. This analysis focuses on the CDPs adjacent to MCB Camp Blaz, including Machananao East, Machananao West, and Machanao. There is no data available for the Finegayan Station CDP which encompasses MCB Camp Blaz.

E.4.9.2 Relevant Past, Present, and Future Actions

Guam and Commonwealth of the Northern Mariana Islands Military Relocation

The 2015 SEIS identified that there would be disproportionately significant direct and indirect socio economic and public health services impacts on low-income populations on Guam associated with the temporary population growth to facilitate construction. The mitigation proposed to address these impacts included adjusting construction tempo and sequencing, and providing technical and financial support as needed. No other disproportionately significant impacts were identified for low-income or minority communities.

E.4.9.3 Cumulative Impact Analysis

The Proposed Action, either the Preferred Alternative or Alternative 2, would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations. Construction of the Proposed Action could contribute to a temporary population and the related stress on socioeconomic and public health services for low-income communities; however, the overall effect would be negligible compared to the ongoing construction of the new cantonment and training areas and ranges for MCB Camp Blaz. The Navy would continue to implement the mitigation measures identified in the 2015 SEIS to address these potential impacts on low-income communities.

Therefore, implementation of the Proposed Action at both the Preferred Alternative and Alternative 2 project areas, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to environmental justice within the ROI.